



Jiaju Zhou

**Handbook of Active Marine Natural Products**

# Handbook of Active Marine Natural Products

Jiaju Zhou



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Jiaju Zhou

# **Handbook of Active Marine Natural Products**



Volume 6: Aliphatic Metabolites

**DE GRUYTER**

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## Preface

The English edition *Handbook of Active Marine Natural Products (HAMNP) with 8 Volumes* is a selective version of the Marine Natural Products Dataset. The whole dataset was collected and developed by the Molecular Design Group, Institute of Process Engineering, Chinese Academy of Sciences during 1998–2016. Totally, it covers 19,722 entries of secondary metabolites from marine living things, where 8,350 compound entries have pharmacological activity data. The 8,350 compound entries were arranged into eight volumes to form the set of handbooks as follows:

*Volume 1: Terpenoids, Part 1*

*Volume 2: Terpenoids, Part 2*

*Volume 3: Alkaloids, Part 1*

*Volume 4: Alkaloids, Part 2*

*Volume 5: Polyketides and Steroids*

*Volume 6: Aliphatic Metabolites*

*Volume 7: O-Heterocycles and Aromatics*

*Volume 8: Peptides and Others*

This set of eight HAMNP books gathers the structure, origin, and bioactivity, as well as other relevant information, of 8,350 active marine natural products from 3,025 marine organisms.

The HAMNP handbooks represent a largest collection of active secondary metabolites from marine organisms, and all kinds of scientific data have been reorganized as well-formatted data so that the books became helpful to researchers as a convenient reference. The materials covered in these books include those through systematic collection up to 2012, and further accompanied with the latest data published in several core journals until 2016.

The work covered in these HAMNP books was accomplished in two phases. The initial phase ranged from 1998 to 2001 and the main phase from 2011 to 2018. In the original version of the dataset, more than 22,000 compounds have been collected, including duplicated compounds from different authors. The comprehensive data compilation process include data specification definition, cross-validation, assessment confirmation, identification of duplicated structures, and merging of relevant information, leading to the final accomplishment of the current 19,722 datasets.

In brief, the main compilation process of the HAMNP books is given as follows. First, collect the name list, origin, and structure of chemical compounds from successive annual reviews (see Core References R01 and R02 in Introduction) and literature reviews. Second, double-check the documents to verify and complete other information. Third, confirm the structural information and other types of data using orthogonal information from other sources with cross-validation methods. Fourth, the structures of more than 22,000 compounds are rechecked and the information is integrated by manual identification and computer programs. Finally, the comprehensive

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information on the 19,722 compounds constitutes the dataset. Here, 8,350 active sets were picked up from the dataset to form the current HAMNP handbook.

Three problems need to be solved to compile a multidisciplinary reference book. First, every definition and concept should be explicit when expanding knowledge, connotation, and extension included, without any research details. Second, the reliability assessment is essential for all kinds of data, because the devil is in the detail. Third, it is essential to search, identify, and integrate data of duplicated chemical compounds. Fortunately, well-developed software packages can help us automatically identify the majority of duplicated chemical compounds. The remaining issues can be resolved along with manual processing.

It is the guiding principle of the author to make the book to be pithy, thorough, precise, and intelligible. In fact, we always view ourselves as HAMNP's readers, with the exclusive objective to let readers gain the most useful knowledge in the shortest possible time.

The core contents and highlights of the HAMNP books are the “three diversities,” that is, the diversity of chemical structures, the diversity of biological resources, and the diversity of pharmacological activities. In terms of chemical structure diversity, we refer to the classification system from references, then further improve and expand it based on the latest research and development to define our classification framework of structures. Once readers browse the contents of the books, the classification system is straightforward. For the diversity of biological resources, it is recommended to refer to Index 3 in each volume – Compound Marine Organism Source Index, and Index 4 in each volume – Compound Marine Source Sampling Geographic Location Index. For the diversity of pharmacological activities, it is recommended to refer to Index 5 in each volume – Compound Pharmacological Activity Index.

These HAMNP handbooks are expected to help readers who are engaged in research, in teaching, and in the development of marine natural products. It should also benefit college students, postgraduates, marine resource managers, and those who are interested in the chemistry and pharmacology of marine natural products. We would feel fortunate if it works as expected.



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February 2019

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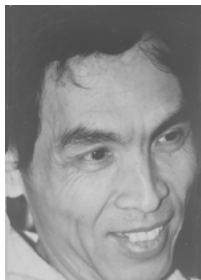
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## About the Author



Prof. Jiaju Zhou was born in October 1939 in Tianjin, China. He graduated from Rare Earth Inorganic Chemistry Specialty, Chemistry Department, Peking University, in 1963 under a six-year program. Before he retired in 2008, Zhou was the leader of Molecule Design Group, IPE, CAS. Zhou's areas of research include rare earth chemistry, mineral analytical chemistry, chemical industry process simulation (in IPE, CAS and UBC, Canada), design of crystal structural database (in OSRD, NIST, Gaithersburg, MD, USA), scientific database R&D, and computer-aided and artificial intelligence drug design. Zhou developed the first TCM database (TCMDB) with 23,033 entries. Since 2008, he has worked on Marine

Natural Products project and has developed the Marine Natural Products Database (MNPDB) with 19,722 entries.

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# Introduction

The *Handbooks of Active Marine Natural Products* covers eight volumes. This book is *Volume 6: Aliphatic Metabolites*, which includes 890 active compounds.

**Format of Compound Entry.** A compound entry starts with a title line, which has two items: the compound's unique code (from 1 to 890 for volume 6) and the main name. The following seven items form the title line as a body, and the graphic structure is placed at the end:

**Title line (code number, main name)**

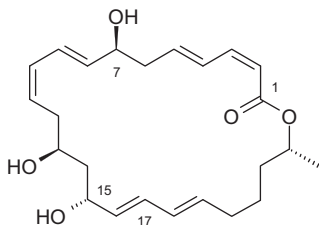
- A. Synonyms of the compound (if any)
- B. Structural type
- C. Formula (relative molecular mass)
- D. Physicochemical properties
- E. Marine source(s)
- F. Pharmacological data (if any)
- G. Reference(s)
- Graphic structure

**Chemical Names and A. Synonyms.** Generally, a compound may have one scientific name and several trivial names. In the handbooks, based on original articles, we select one name as the "main name." The main name appeared at the title line of each compound entry. In most cases, a trivial name was selected as the main name, and in some cases, the main name is a scientific name. Any synonyms, if any, are presented after the title line as an item of the entry body.

**B. Structural Type.** Structural type is the second item, ordered by the contents order.

**F. Normalization of Pharmacological Data.** All of 890 MNP components in this book have pharmacological data, which are very valuable. Because different expressions are used for the same kind of data in different articles, we have to define and normalize thousands of pharmacological terms, so that the data could be expressed in a unified way, and be easily understood by readers.

**Stereochemistry in Graphic Structure.** We protracted all compound structures down to the atomic bond level, including complicated glycosides, with stereochemical information based on the data in the original papers. For example, the structure with full stereochemistry of compound 848 macro-lactin A is



Let us further explain the data structure of source terms and pharmacological terms.

## Source Terms

The source data of compound 848 macrolactin A is

### Source:

An unidentified marine bacterium (psychrophilic, cold water, gram-positive, slurry of sterile seawater and sediment, depth of 980 m sediment core, Northern Pacific Ocean),  
an unidentified marine bacterium (deep water),  
marine bacterium *Bacillus marinus*.

The format is as follows (banding the English-type name and the Latin name together):

### Source:

English-type name + Latin name of source 1 (sampling place, sampling season water depth),  
English-type name + Latin name of source 2 (sampling place, sampling season water depth),  
English-type name + Latin name of source 3.

## Pharmacological Terms

The pharmacological terms in the handbooks are presented in a multilayered structure. In the top layer, there are more than 20 types of most important pharmacological activity terms. They are cytotoxic (in vitro anticancer), antineoplastic (in vivo anticancer), antibacterial, antifungal, antiviral, anti-HIV, anti-inflammatory, antioxidant, antimalarial, NO production inhibitors, enzyme inhibitors, cardiovascular activity, smooth muscle relaxant and stimulant, toxin and medium lethal dose (LD<sub>50</sub>), and so forth. Readers need to be familiar with these Tope lever pharmacological terms (see Table 1).

**Table 1:** Twenty-Four Main Pharmacological Terms in Tope Lever.

Order in Index 5	Pharmacological Terms in Tope Lever
1	Anti-AD
2	Antibacterial
3	Antifungal
4	Anti-HIV
5	Anti-inflammatory
6	Antileishmanial
7	Antimalarial
8	Antineoplastic (in vivo)
9	Antioxidant
10	Antiplasmodial
11	Antitrypanosomal
12	Antituberculosis
13	Antiviral
14	Cardiovascular activity
15	Cell cycle inhibitor
16	Cell division inhibitor
17	Cell growth inhibitor
18	Cell adhesion inhibitor
19	Cytotoxic (in vitro)
20	Enzyme inhibitors
21	NO production inhibitors
22	Smooth muscle relaxant and stimulant
23	Toxin
24	Medium lethal dose (LD <sub>50</sub> )

For each term there is a regulation about how to describe related pharmacological data. The following is an example. Under the subtitle “Pharm:” of compound 848 macrolactin A, a set of multiple biodata is presented as follows:

**Pharm:**

**Antibacterial** (standard agar plate-assay disk methods, *Bacillus subtilis*, 5 µg/disk; *Staphylococcus aureus*, 20 µg/disk);

**cytotoxic** (B16-F-10, IC<sub>50</sub> = 3.5 µg/mL);

**cytotoxic** (Hep2 and MA-104 carrier cell lines);

**antiviral** (HSV-1, IC<sub>50</sub> = 5.0 µg/mL; HSV-2, IC<sub>50</sub> = 8.3 µg/mL);

**T-lymphoblast cell protectant** (against hmn HIV viral replication, 10 µg/mL);

**neuronal cell protectant.**

The format is as follows:

**Pharm:**

**Term name 1** (formatted detail information)

**Term name 2** (formatted detail information)

**Term name 3** (formatted detail information)

**Term name 4** (formatted detail information)

**Term name 5** (formatted detail information)

**Term name 6** (formatted detail information)

Under the *term name Cytotoxic*, a set of multiple cytotoxic biodata is presented as follows:

**cytotoxic** (  
B16-F-10, IC<sub>50</sub> = 3.5 µg/mL;  
Hep2 carrier cell lines;  
MA-104 carrier cell lines).

The format is as follows:

**Term name** (*in vitro*,  
target cancer cell 1, quantitative data (if any),  
target cancer cell 2, quantitative data (if any),  
target cancer cell 3, quantitative data (if any),  
brief description of related mechanism if any)).

In order to standardize abbreviations of cancer cells, such as P<sub>388</sub>, A549, HT29, MEL28, CCRF-CEM, and DLD-1, we defined and used 438 cancer cell codes (CCC) in the handbooks. For explanation of these codes, please see Appendix 2 “Cancer Cell Codes.”

By means of the formatted and structuralized methods, we normalized expressions of almost all the pharmacological data presented in the books. For complete information in volume 6, of all 669 normalized pharmacological activity terms, please see “Index 5 Compound Pharmacological Activity Index.”

In summary, these handbooks with eight volumes provide an integrated collection of 8,350 marine natural products’ chemical components isolated from 3,025 marine organisms and a large amount of pharmacological activity data of these components. It might be used not only as a handbook to look for structures and bioactivities of marine natural products and marine organisms source information, but also as a fundamental platform for studying the marine natural products with a systematic and integrative approach.

## Acknowledgments

First, as the author of those books, I would like to give my heartfelt thanks to Dr. David Lide and B.J. Lide, who were my directors 30 years ago when I worked in OSRD, NIST (former NBS), USA, in 1985–1986 for nine months. They gave me a rare opportunity to learn how to use a software platform and how to treat a complicated scientific information data system. It is my research experience in NBS that helped me to compile easily the current huge project on Marine Natural Products. At the same time, I also give my *sincere* thanks to my NBS's colleagues: Dr. John Rumble, Mrs. Geraldine Dalton, Mrs. Phoebe Fagan, and other OSRD members.

Then, I would like to give my genuine thanks to the following two close friends. They gave my MNP project continual concerns and supports for years: Dr. Jun Xu, Professor and Director, Research Center for Drug Discovery, Sun Yet-Sen University, 132 East Circle, University City, Guangzhou 510006, China, and Dr. Leming Shi, Professor and Director, Center for Pharmacogenomics, School of Life Sciences and Shanghai Cancer Center, Fudan University, Shanghai 200438, China (lemingshi@fudan.edu.cn).

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- 10 Madam Guirong Xie, Associate Professor, Institute of Process Engineering, Chinese Academy of Sciences, Beijing 100190, China (part of data compilation)
- 11 Mr. Wucheng Tang, Engineer, Institute of Process Engineering, Chinese Academy of Sciences, Beijing 100190, China (part of original paper collection)

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# How to Use the HAMNP Books

In essence, from data computerization point of view, scientific knowledge is the expression of interrelation between research objects in different types. During a long coastline without computer, people learn and spread scientific knowledge in traditional ways, including education, reading, and exchanging information with each other. In today's world, using computer's powerful functions, we have a new way to learn systematical, complete knowledge. In short, a study process in the new way is to *search and learn some relationships*.

Next, we discuss concretely how to use the HAMNP books.

In these books, there are three kinds of data and three pairs of important relations. Three kinds of data are (1) marine living sources (source); (2) secondary metabolites (compounds); and (3) pharmacological activities (pharm-activity). The three pairs of important relations are (1) relationship between source and compounds; (2) relationship between compounds and pharm-activity; and (3) relationship between source and pharm-activity. In the case of asking questions, each relation has two directions; hence, together there are six types of questions:

Type 1: from known source to unknown compound

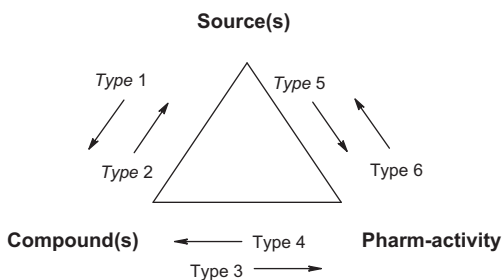
Type 2: from known compound to unknown source

Type 3: from known compound to unknown pharm-activity

Type 4: from known pharm-activity to unknown compound

Type 5: from known source to unknown pharm-activity

Type 6: from known pharm-activity to unknown source (Figure 1)



**Figure 1:** Kinds of Data and Six Types of Questions.

## (1) An Illustration of Type 1 (and Type 3, Type 5) Question

Up to now, what aliphatic compounds are isolated from stony corals of genus *Montipora*? From index 3 of volume 6, one will get the following related data in detail:

<https://doi.org/10.1515/9783110655797-204>

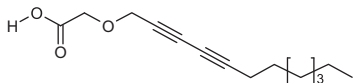
*Montipora digitata* 160, 306, 307.

*Montipora* sp. 164, 181, 182, 245, 246, 247, 248, 249, 250, 251, 252, 253, 305, 306, 307, 335, 370.

*Montipora* spp. 224.

The answer of the current question must be these 19 aliphatic compounds: 160, 164, 181, 182, 224, 245, 246, 247, 248, 249, 250, 251, 252, 253, 305, 306, 307, 335, 370.

Then, readers can enjoy studying these 19 compounds by reading the book, including their pharm-activity (question of types 3 and 5). For example, with entry 306, a reader will know that the compound 306 Montiporic acid A had already been isolated from stony corals *Montipora digitata* (eggs), *Madrepora oculata* and *Montipora* sp., and it has cytotoxic activity (A549, ED<sub>50</sub> = 6.31 µg/mL; SK-OV-3, ED<sub>50</sub> = 7.50 µg/mL; SK-MEL-2, ED<sub>50</sub> = 7.97 µg/mL; XF498, ED<sub>50</sub> = 7.72 µg/mL; HCT15, ED<sub>50</sub> = 8.30 µg/mL; control cisplatin: A549, ED<sub>50</sub> = 0.75 µg/mL; SK-OV-3, ED<sub>50</sub> = 1.09 µg/mL; SK-MEL-2, ED<sub>50</sub> = 2.18 µg/mL; XF498, ED<sub>50</sub> = 1.18 µg/mL; HCT15, ED<sub>50</sub> = 0.85 µg/mL; P<sub>388</sub>, IC<sub>50</sub> = 5.0 µg/mL); antibacterial activity (*Escherichia coli*); and feeding attractant activity (prosobranch *Drupella cornus*).



## (2) An Illustration of Type 4 (and Type 2, Type 6) Question

“What are isolated compounds with pharmacological activity against hmn non-small cell lung cancer A549 from aliphatic compounds? And what are their marine sources?”

To browse Index 5 of volume 6, searching “Cytotoxic, A549” and “Cytotoxic inactive, A549,” the following results were obtained (the “Cytotoxic inactive” means that pharmacological assay has been done, but the result is not active or activity being very low):

Cytotoxic, A549 141, 142, 154, 155, 156, 160, 162, 187, 194, 198, 199, 200, 204, 205, 206, 215, 216, 219, 221, 224, 249, 250, 251, 252, 306, 307, 336, 337, 352, 386, 408, 425, 435, 436, 443, 445, 459, 463, 474, 481, 492, 499, 500, 524, 531, 532, 588, 589, 590, 808, 822, 869.

Cytotoxic, A549/ATCC: CCL8 417, 418, 419.

Cytotoxic, A549, 6:4 mixture of stolonoxide C and stolonoxide D 497, 497, 498, 498.

Cytotoxic, A549, 9:1 mixture of stolonoxide A and stolonoxide B 495, 495, 496, 496.

Cytotoxic, A549/ATCC 426, 465.

Cytotoxic inactive, A549 122, 135, 141, 165, 181, 182, 196, 197, 217, 218, 220, 245, 246, 247, 248, 258, 259, 305, 335, 338, 370, 386, 441, 540, 875.

Cytotoxic inactive, A549/ATCC 464, 466.

Further, from the entry bodies of the 61 active aliphatic compounds (141, 142, 154–156, 160, 162, 187, 194, 198–200, 204–206, 215, 216, 219, 221, 224, 249–252, 306, 307, 336, 337, 352, 386, 408, 417–419, 425, 426, 435, 436, 443, 445, 459, 463, 465, 474, 481, 492, 495–500, 524, 531, 532, 588–590, 808, 822, and 869) all sources can be obtained (see Table 2).

**Table 2:** Answer to the Above Type 4, 2, and 6 Questions.

Vol	Code	Compound Name	Type	Related Sources
6	141	Woodylide A	Branched alkenic compounds	Sponge <i>Plakortis simplex</i> (Yongxing I., South China Sea, China)
6	142	Woodylide B	Branched alkenic compounds	Sponge <i>Plakortis simplex</i> (Yongxing I., South China Sea, China)
6	154	Dideoxypetrosynol D	Acetylenic alcohols	Sponge <i>Petrosia</i> sp. (Korea waters)
.....	.....	.....	.....	.....
6	808	Jaspine A	Sphingolipids	Sponge <i>Jaspis</i> sp.
6	822	Penazetidine A	Sphingolipids	Sponge <i>Penares sollasi</i> (Indo-Pacific)
6	869	Elenic acid	Long-chain aromatic systems	Sponge <i>Plakortis</i> spp. Sponge <i>Plakinastrella</i> sp. (Indonesia)

In summary, by using three parts of the books – the contents (ordered by structural classifications), the text (8,350 compound entries in volumes 1–8), and the indexes – readers can easily gain well-formatted systematically related knowledge in multidisciplinary fields.



# List of Abbreviations and Acronyms

[ <sup>3</sup> H]AMPA	[ <sup>3</sup> H]-1-amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid
[ <sup>3</sup> H]CGS-19755	<i>N</i> -methyl-D-aspartic acid (NMDA) receptor antagonist
[ <sup>3</sup> H]CPDPX	[ <sup>3</sup> H]-1,3-dipropyl-8-cyclopentylxanthine
[ <sup>3</sup> H]DPDPE	opioid peptide
[ <sup>3</sup> H]KA	[ <sup>3</sup> H]-kainic acid
‡	homonym mark
3Y1	rat fibroblasts
5-FU	5-fluorouracil
6-MP	6-mercaptopurine
6-OHDA	6-hydroxydopamine
AAI	antioxidant activity index (final DPPH concentration/EC <sub>50</sub> )
ABRCA	amphotericin B-resistant <i>Candida albicans</i>
ABTS <sup>•+</sup>	2,2'-azino-bis-(3-ethyl benzthiazoline 6-sulfonic acid), radical
ACAT	Acyl-CoA: cholesterol acyl transferase
ACE	angiotensin-converting enzyme
AChE	acetylcholinesterase
ACTH	adrenocorticotrophic hormone
ADAM9	ADAM9 protease
ADAM10	ADAM10 protease
ADM	adriamycin
AGE	advanced glycation end products
AIDS	acquired immune deficiency syndrome
AKT	ribosomal protein
AKT1	protein kinase
ALK	protein kinase
AMPB	amphotericin B
AP-1	transcription factor
APOBEC3G	hmn innate intracellular antiviral factor (recombinant protein)
aq	aqueous solution
ARCA	amphotericin-resistant <i>Candida albicans</i>
ARK5	protein kinase
ATCC	American Type Culture Collection
ATPase	adenosine triphosphatase
Aurora-B	protein kinase
AXL	protein kinase
AZT	3'-azido-3'-deoxythymidine
BACE	β-secretase
BACE1	β-secretase
BCG	Bacille Calmette-Guérin
Bcl-2	a cell survival promoting factor
BoMC	further abbreviation on <i>Bioorg. Med. Chem.</i>
BoMCL	further abbreviation on <i>Bioorg. Med. Chem. Lett.</i>
bp	boiling point
<i>c</i>	concentration
CaMKIII	protein kinase
cAMP	cyclic adenosine monophosphate
CAPE	caffeic acid phenethyl ester

<https://doi.org/10.1515/9783110655797-205>



caspase-3	caspase-3 protein
CB	cytochalasin B
CC <sub>50</sub>	IC <sub>50</sub> of cytotoxicity (concentration of the 50% cytotoxic effect)
CCR5	chemokine receptor 5
CD	concentration required to double the specific activity
Cdc2	cyclin-dependent kinase
Cdc25	protein Cdc25 phosphatase
Cdc25a	protein phosphatase
Cdc25b	recombinant hmn phosphatase
CDDP	<i>cis</i> -diaminedichloroplatinum (cisplatin)
CDK	cyclin-dependent kinase
CDK1	protein kinase
CDK2	protein kinase
CDK4	protein kinase
CDK4/cyclin D1	cyclin-dependent kinase 4 (CDK4) in complex with its activator cyclin D1
P25	protein kinase
p25	protein kinase
CDK7	protein kinase
<i>c-erbB-2</i>	protein kinase
CETP	cholesterol ester transfer protein
cGMP	cyclic guanylic acid, cyclic guanosine monophosphate
CGRP	calcitonin gene-related peptide
ChAT	choline acetyltransferase
CMV	CMV protease
CNS	central nervous system
COMPARE	COMPARE is an algorithm to analyze data
ConA	concanavalin A
COX-1	cyclooxygenase-1
COX-2	cyclooxygenase-2
CPB	further abbreviation on <i>Chem. Pharm. Bull.</i>
cPLA <sub>2</sub>	cytosolic 85 kDa phospholipase
CPT	camptothecin
CRPF	chloroquine-resistant <i>Plasmodium falciparum</i>
CRPF FcM29	chloroquine-resistant <i>Plasmodium falciparum</i> FcM29
CSPF	chloroquine-sensitive <i>Plasmodium falciparum</i>
Cyp1A	aromatase cytochrome P450 1A
CYP1A	cytochrome P450 1A
CYP450 1A	cytochrome P450 1A
d	day
<i>D</i>	diameter (mm)
Delta	difference in log <sub>10</sub> GI <sub>50</sub> (mol/L) value of the most sensitive cell line and MG-MID value
DGAT	diacylglycerol acyltransferase
DHFR	dihydrofolate reductase
DMSO	dimethyl sulfoxide
DNA	deoxyribonucleic acid
DOX	doxorubicin
DPI	diphenylene indonium
DPPH	1,1-diphenyl-2-picrylhydrazyl free radical

DRPF	drug-resistant <i>Plasmodium falciparum</i>
DRS	drug-resistant <i>Staphylococcus</i> sp.
DSPF	drug-sensitive <i>Plasmodium falciparum</i>
DYRK1A	protein kinase
EBV	Epstein–Barr virus
EC	effective concentration
EC <sub>50</sub>	medium effective concentration
ED <sub>50</sub>	effective dose for 50%
ED <sub>50</sub>	medium effective dose (sometimes for the medium effective concentration)
EGF	epidermal growth factor
EGFR	epidermal growth factor receptor
EL-4	lymphoma cell line with resistance to natural killer cells
ELISA	enzyme-linked immunosorbent assay
EPI	epirubicin
ERK	extracellular signal-regulated protein kinase
ESBLs	extended spectrum $\beta$ -lactamase
EurJOC	further abbreviation on <i>Eur. J. Org. Chem.</i>
FAK	protein kinase
FBS	fetal bovine serum
FLT3	a protein tyrosine kinase
Flu-A	influenza virus type A
Flu-B	influenza virus type B
fMLP/CB	<i>N</i> -formyl-L-methionyl-L-leucyl-L-phenylalanine/cytochalasin B
FOXO1a	downstream target of PTEN tumor suppressor
fp	freezing point
FPT	farnesyl protein transferase
FRCA	fluconazole-resistant <i>Candida albicans</i>
FtsZ	a structural homolog of eukaryotic tubulin, a GTPase
FXR	farnesoid X receptor
GABA	$\gamma$ -aminobutyric acid
GI <sub>50</sub>	the concentration of sample necessary to inhibit the growth to 50% of the control
GlyR	glycine-gated chloride channel receptor
gp41	a transmembrane protein of HIV-1 (recombinant protein)
gpg	guinea pig
GPR12	G protein-coupled receptor 12; it can be a significant molecular target for treating a variety of neurological disorders
GRP78	molecular chaperone (chaperone)
GST	glutathione <i>S</i> -transferases
GTP	guanosine triphosphate
GU4	<i>Candida albicans</i> -sensitive GU4 strain
GU5	<i>Candida albicans</i> -resistant GU5 strain
h	hour
H1N1	influenza virus H1N1
H3N2	influenza virus H3N2
H5N1	influenza virus A H5N1
HBV	hepatitis B virus
HC <sub>50</sub>	medium hemolytic concentration
HCMV	hmn cytomegalovirus

HCV	hepatitis C virus
HD	a positive control compound; no concrete explanation in original paper (J. Qin, et al, BoMCL, 2010, 20, 7152)
HER2	tyrosine kinase
HF	hypersensitivity factor
HIF-1	hypoxia-inducible factor-1
HIV	hmn immunodeficiency virus
HIV-1	hmn immunodeficiency virus type 1
HIV-1 IIIIB	hmn immunodeficiency virus type 1 IIIIB
HIV-1 in	hmn immunodeficiency virus type 1 integrase
HIV-1 <sub>RF</sub>	hmn immunodeficiency virus RF
HIV-1-rt	hmn immunodeficiency virus type 1 reverse transcriptase
HIV-2	hmn immunodeficiency virus type 2
HIV-rt	hmn immunodeficiency virus reverse transcriptase
HLE	hmn leukocyte elastase
HMG-CoA	3-hydroxy-3-methylglutaryl coenzyme A reductase
hmn	human
HNE	hmn neutrophil elastase
HO*	hydroxyl radical
hPPAR $\delta$	hmn peroxisome proliferator-activated receptor delta
HSV	herpes simplex virus
HSV-1	herpes simplex virus 1
HSV-2	herpes simplex virus 2
hTopo I	hTopo I isomerase
HXB2	T-cell tropic viral strain
IC	inhibiting concentration
IC <sub>50</sub>	median inhibiting concentration
IC <sub>90</sub>	inhibiting concentration for 90%
IC <sub>100</sub>	absolute inhibiting concentration
ICR	imprinting control region mouse
ID	inhibition diameter (mm)
ID <sub>50</sub>	median inhibiting dose
IDE	insulin-degrading enzyme
IDO	indoleamine 2,3-dioxygenase
IFV	influenza virus
IgE	immunoglobulin E
IGF1-R	protein kinase
IgM	immunoglobulin M
IL	interleukin
IL-1	interleukin-1
IL-1 $\alpha$	interleukin-1 $\alpha$
IL-1 $\beta$	interleukin-1 $\beta$
IL-2	interleukin-2
IL-4	interleukin-4
IL-5	interleukin-5
IL-6	interleukin-6
IL-8	interleukin-8
IL-12	interleukin-12
IL-13	interleukin-13

IM	immunomodulator
IMPDH	inosine monophosphate dihydrogenase
IN	integrase
iNOS	inducible nitric oxide synthase
InRt	inhibitive rate
ip	intraperitoneal injection
iv	intravenous injection
IZ	inhibition zone (mm)
IZD	inhibition zone diameter (mm)
IZR	inhibition zone radii (mm)
JACS	further abbreviation on <i>J. Am. Chem. Soc.</i>
Jak2	Janus kinase 2
JCS Perkin I	further abbreviation on <i>J. Chem. Soc., Perkin Trans. I</i>
JMC	further abbreviation on <i>J. Med. Chem.</i>
JNK	c-Jun NH <sub>2</sub> -terminal kinase
JNP	further abbreviation on <i>J. Nat. Prod.</i>
JOC	further abbreviation on <i>J. Org. Chem.</i>
KDR	a protein tyrosine kinase
KU-812	hmn basophilic granulocyte
LAV	T-cell tropic viral strain
LC <sub>50</sub>	concentration at which only 50% of the cells are viable
LCV	lymphocyte viability
LD	lethal dose
LD <sub>100</sub>	100% lethal dose
LD <sub>50</sub>	medium lethal dose
LD <sub>99</sub>	99% lethal dose
LDH	lactate dehydrogenase
LOX	lipoxygenase
LPS	lipopolysaccharide
LTB <sub>4</sub>	leukotriene B <sub>4</sub>
LTC <sub>4</sub>	leukotriene C <sub>4</sub>
LY294002	phosphatidylinositol-3-kinase inhibitor; used as a positive control in anti-inflammatory assay
MABA	microplate Alamar blue assay
MAGI test	also called single life cycle test, reflects only one round of infection
MAPKAPK-2	mitogen-activated protein kinase-activated protein kinase 2
MAPKK	mitogen-activated protein kinase kinase
MBC	minimum bactericidal concentration
MBC <sub>90</sub>	minimum bactericidal concentration for 90%
MBEC <sub>90</sub>	minimum biofilm eradication counts for 90%
MCV	poxvirus <i>Molluscum contagiosum</i> virus
MDR	multidrug resistance
MDR1	major facilitator superfamily 1; one type of efflux pump in <i>C. albicans</i> , which functions as an H <sup>+</sup> -antiporter
MDRPF	multidrug-resistant <i>Plasmodium falciparum</i>
MDRSA	multidrug-resistant <i>Staphylococcus aureus</i>
MDRSP	multidrug-resistant <i>Streptococcus pneumoniae</i>
MEK1 wt	protein kinase
MET wt	protein kinase

MG-MID	mean value of $\log_{10} GI_{50}$ (mol/L) over all cell lines tested
MIA	minimal inhibitory amounts ( $\mu\text{g}/\text{disk}$ )
MIC	minimum inhibitory concentration
MIC <sub>50</sub>	minimal inhibitive concentration for 50%
MIC <sub>80</sub>	minimal inhibitive concentration for 80%
MIC <sub>90</sub>	minimal inhibitive concentration for 90%
MID	minimum inhibitory dose
min	minute
MLD	minimum lethal dose
MLR	mixed lymphocyte reaction
MMOA	molecular mechanism of action
MMP	matrix metalloproteinases
MMP-2	matrix metalloproteinase-2
MoBY-ORF	molecular barcoded yeast open-reading frame library method
mp	melting point
MPtpA	mycobacterial protein tyrosine phosphatase A
MPtpB	mycobacterial protein tyrosine phosphatase B
mPTPB	<i>Mycobacterium tuberculosis</i> protein tyrosine phosphatase B
MREC	methicillin-resistant <i>Escherichia coli</i>
MRSA	methicillin-resistant <i>Staphylococcus aureus</i>
MRSE	methicillin-resistant <i>Staphylococcus epidermidis</i>
MSR	macrophage scavenger receptor
MSSA	methicillin-sensitive <i>Staphylococcus aureus</i>
MSSE	methicillin-sensitive <i>Staphylococcus epidermidis</i>
MT1-MMP	membrane type 1 matrix metalloproteinase
MT4	MT4 cells containing HIV-1 IIIB virus
MTT	3-(4,5-dimethylthiazole-2-yl)-2,5-diphenyltetrazolium bromide
MTT assay	a cytotoxicity measurement method, tetrazolium-based colorimetric assay, see L. V. Rubinstein, et al., Nat. Cancer Inst., 82, 1113~1118 (1990)
mus	mouse
<i>n</i>	number of parallel experiments
nACh	nicotinic acetylcholine
NADH	reduced nicotinamide adenine dinucleotide
NDM-1	New Delhi metallo- $\beta$ -lactamase-1
NEK2	protein kinase
NEK6	protein kinase
NF- $\kappa$ B	NF- $\kappa$ B serves as a central regulator of hm immune, inflammatory, and antiapoptotic responses (Ghosh et al., 1998, Ann. Rev. Immunol, 16, 225-260).
NFRD	NADH-fumarate reductase
NGF	nerve growth factor
NMDA	<i>N</i> -methyl-D-aspartate
NO $\cdot$	nitric oxide free radical
NPR	further abbreviation on <i>Nat. Prod. Rep.</i>
O <sub>2</sub> $\cdot^-$	superoxide free radical
ONOO $^-$	peroxy nitrite free radical
ORAC	oxygen radical absorbance capacity
orl	oral
p24	p24 protein

P2Y receptors	one type of purine receptors, which includes P1 (adenosine receptors) and P2 receptors [ionotropic P2X and metabotropic (G protein-coupled) P2Y]
P2Y <sub>11</sub> receptor	one of eight P2Y subtypes
P450	cytochrome P450
p56lck	tyrosine kinase
PAcF	platelet activating factor
PAF	platelet aggregation factor
PD	Parkinson's disease
pD <sub>2</sub> (=pEC <sub>50</sub> )	negative logarithm (−log <i>M</i> ) of molar concentration required to produce 50% of the maximum response (EC <sub>50</sub> )
PDE5	phosphodiesterase 5
PDGF	platelet-derived growth factor
PfGSK-3	kinase
Pfnek-1	a NIMA-related protein kinase of <i>Plasmodium falciparum</i>
PfPK5	kinase
PfPK7	kinase
PGE <sub>2</sub>	prostaglandin E2
PHK	primary hmn keratinocytes
PIM1	protein kinase
PK	protein kinase
PKA	protein kinase A
PKC	protein kinase C
PKC-ε	protein kinase C-ε
PKD	ribosomal protein
PKG	protein kinase G
PLA	phospholipase A
PLA <sub>2</sub>	phospholipase A <sub>2</sub>
PLCγ1	ribosomal protein
PLK1	protein kinase
PM	further abbreviation on <i>Planta Med.</i>
PMA (=TPA)	phorbol-12-myristate-13-acetate
PMNL	hmn polymorphonuclear leukocyte
PP	protein phosphatase
PP1	protein phosphatase PP1
PP2A	protein phosphatase PP2A
pp60 <sup>V-SRC</sup>	tyrosine kinase
PPAR	peroxisome proliferator-activated receptor
PPDK	pyruvate phosphate dikinase
PR	protease
PRK1	protein kinase
PRNG	penicillin-resistant <i>Neisseria gonorrhoeae</i>
PRSP	penicillin-resistant <i>Staphylococcus pneumoniae</i>
PTEN	tumor suppressor, an identified tumor suppressor gene located on hmn chromosome 10q23.3
PTK	protein tyrosine kinase
PTP1B	protein tyrosine phosphatase 1B, an important target for treatment of type II diabetes
PTPB	protein tyrosine phosphatase B
PTPS2	protein tyrosine phosphatase S2

**XXX** — List of Abbreviations and Acronyms

PV-1	<i>Polio virus</i>
PXR	pregnane X receptor
QR	NAD(P)H: quinone reductase
Range	difference in log <sub>10</sub> GI <sub>50</sub> (mol/L) value of the most sensitive cell line and the least sensitive cell
rat	white rat
rbt	rabbit
RLAR	rat lens aldose reductase
RNA	ribonucleic acid
ROS	reactive oxygen species (involved in genesis of various cancers, arteriosclerosis, rheumatism, and aging)
RS321	code of a yeast
RSV	respiratory syncytial virus
RT	reverse transcriptase
RU	response unit of binding capacity to HIV-1 targets, 1 RU = 1 pg/mm <sup>2</sup>
RyR1-FKBP12	RyR1-FKBP12 Ca <sup>2+</sup> channel, a tetrameric heterodimeric channel protein (~2000 kDa) associated with smaller 12 kDa immunophilin FKBP12
S6	ribosomal protein
SAK	a protein kinase
SARS	severe acute respiratory syndrome
ScRt	scavenging rate
SF162	macrophage-tropic viral strain
SI	IC <sub>50</sub> of testing cells/IC <sub>50</sub> of HUVECs
SI	selective index = cytotoxic CC <sub>50</sub> /target EC <sub>50</sub>
SI	selective index = cytotoxic IC <sub>50</sub> /target IC <sub>50</sub>
SI	selective index = cytotoxic IC <sub>50</sub> /target MIC
SI	selective index = cytotoxic TC <sub>50</sub> /target IC <sub>50</sub>
SIRT2	hmn sirtuin type 2 (a NAD <sup>+</sup> -dependent cytoplasmic protein that is co-localized with HDAC6 on microtubules. SIRT2 has been shown to deacetylate $\alpha$ -tubulin and to control mitotic exit from the cell cycle)
sp.	species
spp.	species (plural)
SR	sarcoplasmic reticulum
SRB	sulforhodamine B assay
SRC	protein kinase
SV40	SV40 virus
Syn.	synonym
T/C	survival ratio [survival time of treated animal ( <i>T</i> ) was compared to that of control animal ( <i>C</i> ) expressed as a percent ( <i>T/C</i> %)]
TACE	$\alpha$ -secretase (a serine protease)
<i>Taq</i> DNA polymerase	a DNA polymerase isolated from the thermophilic bacterium <i>Thermus aquaticus</i>
TBARS	thiobarbituric acid-reactive substance assay
TC <sub>50</sub>	50% cytotoxic concentration
TEAC	Trolox equivalent antioxidant capacity
TGI	100% growth inhibition
TMV	tobacco mosaic virus
TNF $\alpha$	tumor necrosis factor- $\alpha$
TPA (=PMA)	12- <i>O</i> -tetradecanoyl phorbol 13-acetate

TPK	tyrosine protein kinase
TRP	transient receptor potential cationic channel
TRPA1	transient receptor potential cationic channel of subfamily A1
TRPV1	transient receptor potential cationic channel of subfamily V1
TRPV3	transient receptor potential cationic channel of subfamily V3
TXB <sub>2</sub>	thromboxane B <sub>2</sub>
TZM-bl	host cell in HIV-1 neutralization assay
USP7	a deubiquitylating enzyme hydrolyzing isopeptide bond at C-terminus of ubiquitin is an emerging cancer target
VCAM	vascular cell adhesion molecule
VCAM-1	vascular cell adhesion molecule-1
VCR	vincristine
VEGF	vascular endothelial growth factor
VEGF-A	vascular endothelial growth factor A
VEGFR2	tyrosine kinase VEGFR2
VE-PTP	protein phosphatase
VGSC	voltage-gated sodium channel
VHR	vaccinia open-reading frame H1-related protein phosphatase
Vif	viral infectivity factor of HIV-1
VP-16	etoposide (Sigma product), a positive control for cytotoxic assay
VRE	vancomycin-resistant <i>Enterococcus</i> sp.
VREF	vancomycin-resistant <i>Enterococcus faecium</i>
VSE	vancomycin-sensitive <i>Enterococcus</i> sp.
VSSC	voltage-sensitive sodium channel
VSV	<i>Vesicular stomatitis virus</i>
WST-8	2-(2-methoxy-4-nitrophenyl)-3-(4-nitrophenyl)-5-(2,4-disulfo-phenyl)-2H-tetrazolium, monosodium salt
XTT	sodium 3'-[1-(phenylaminocarbonyl)-3,4-tetrazolium] bis(4-methoxy-6-nitrobenzene)sulfonic acid
YU2-V3	viral strain





# List of Cancer Cell Codes

This set of codes for 438 cancer cells, named as *CCC codes*, are defined and tried out in the books by the author. The codes of some normal cells are also listed below.

293T	kidney epithelial cells
3T3-L1	murine fibroblasts
5637	superficial bladder cancer (cell)
786-0	hmn renal cancer (cell)
9KB	hmn <i>epidermoid</i> nasopharyngeal carcinoma (cell)
A-10	rat aorta cells
A2058	hmn (cell)
A278	hmn ovarian tumor (cell)
A2780	hmn ovarian tumor (cell)
A2780CisR	hmn ovarian tumor (cell)
A2780/DDP	hmn ovarian tumor (cell)
A2780/Tax	hmn ovarian tumor (cell)
A375	hmn melanoma (cell)
A375-S2	hmn melanoma (cell)
A431	hmn epidermic cancer (cell)
A498	hmn renal cancer (cell)
A549	hmn nonsmall cell lung cancer (cell)
A549 NSCL	hmn nonsmall cell lung cancer (cell)
A549/ATCC	hmn nonsmall cell lung cancer (cell)
ACC-MESO-1	hmn malignant pleural mesothelioma (cell)
ACHN	hmn renal cancer (cell)
AGS	gastric adenocarcinoma (cell)
AsPC-1	hmn pancreatic cancer (cell)
B16	mouse melanoma (cell)
B16F1	mouse melanoma (cell)
B16-F-10	mouse melanoma (cell)
BC	hmn breast cancer (cell)
BC-1	hmn breast cancer (cell)
BCA-1	hmn breast cancer (cell)
BEAS2B	normal hmn lung bronchial cells
Bel7402	hmn liver cancer (cell)
BG02	normal hmn embryonic stem cells
BGC823	hmn gastric cancer (cell)
BOWES	hmn cells
BR1	DNA repair competent Chinese hamster ovary (cell)
BSC	normal monkey kidney cells
BSC-1	normal African Green Monkey kidney cells
BSY1	breast cancer (cell)
BT-483	hmn breast carcinoma (cell)
BT549	hmn galactophore cancer (cell)
BT-549	hmn breast cancer (cell)
BXF-1218L	hmn bladder cancer (cell)
BXF-T24	hmn bladder cancer (cell)
BXPC	hmn pancreas cancer (cell)

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BXPC3	hmn pancreas cancer (cell)
C6	rat glioma (cell)
C26	hmn colon carcinoma (cell)
C38	murine colon adenocarcinoma (cell)
CA46	hmn Burkitt's lymphoma (cell)
Ca9-22	hmn gingival carcinoma (cell)
CaCo-2	hmn epithelial colorectal adenocarcinoma (cell)
CAKI-1	hmn renal cancer (cell)
Calu	prostate carcinoma (cell)
Calu3	nonsmall cell lung cancer (cell)
CCRF-CEM	hmn T-cell acute lymphoblastic leukemia (cell)
CCRF-CEMT	leukemia (cell)
CEM	hmn leukemia (cell)
CEM-TART	T cells that express both HIV-1 tat and rev
CFU-GM	hmn/murine hematopoietic progenitor cells
CHO	Chinese hamster ovary cells
CHO-K1	subclone of normal Chinese hamster ovary cells
CML K562	chronic myelogenous leukemia (cell)
CNE	hmn nasopharyngeal carcinoma (cell)
CNE2	hmn nasopharyngeal carcinoma (cell)
CNS SF295	hmn brain tumor (cell)
CNXF-498NL	hmn glioblastoma cancer (cell)
CNXF-SF268	hmn glioblastoma cancer (cell)
Colo320	hmn colorectal cancer (cell)
Colo357	hmn colorectal cancer (cell)
Colon26	colorectal cancer (cell)
Colon38	mus colorectal cancer (cell)
Colon205	colorectal cancer (cell)
Colon250	colorectal cancer (cell)
CV-1	monkey kidney fibroblasts
CXF-HCT116	hmn colon cancer (cell)
CXF-HT29	hmn colon cancer (cell)
DAMB	hmn mammary carcinoma (cell)
DG-75	hmn B lymphocyte (cell)
DLAT	Dalton's lymphoma ascites tumor (cell)
DLD-1	hmn colorectal adenocarcinoma (cell)
DLDH	hmn colorectal adenocarcinoma (cell)
DMS114	hmn lung cancer (cell)
DMS273	hmn small cell lung cancer (cell)
Doay	hmn medulloblastoma (cell)
Dox40	hmn myeloma (cell)
DU145	prostate cancer (cell)
DU4475	breast cancer (cell)
E39	hmn renal carcinoma (cell)
EAC	Ehrlich ascites carcinoma (cell)
EKVX	hmn nonsmall cell lung cancer (cell)
EM9	topoisomerase I-sensitive Chinese hamster ovary (cell)
EMT-6	mouse tumor cells
EPC	carp epithelium (cell)

EVLC-2	SV40 large T-antigen immortalized hmn umbilical vein cells
F1	hmn amniotic epithelial cells
FADU	pharynx-sq cancer (cell)
Farage	hmn lymphoma (cell)
Fem-X	melanoma (cell)
Fl	hmn amniotic epithelial cell line
FM3C	mus mammary tumor (cell)
G402	hmn renal leiomyoblastoma
GM7373	bovine endothelial (cell)
GR-III	adenocarcinoma (cell)
GXF-251L	hmn stomach cancer (cell)
H116	hmn colorectal cancer (cell)
H125	hmn colorectal cancer (cell)
H441	hmn lung adenocarcinoma (cell)
H460	hmn lung cancer (cell)
H522	hmn nonsmall cell lung cancer (cell)
H1299	hmn lung adenocarcinoma (cell)
H1325	hmn nonsmall cell lung cancer (cell)
H1975	hmn cancer (cell)
H2122	hmn nonsmall cell lung cancer (cell)
H2887	hmn nonsmall cell lung cancer (cell)
H69AR	multidrug-resistant small cell lung cancer (cell)
H929	hmn myeloma (cell)
H9c2	rat cardiac myoblasts
HBC4	breast cancer (cell)
HBC5	breast cancer (cell)
HBL100	breast cancer (cell)
HCC366	hmn nonsmall cell lung cancer (cell)
HCC2998	hmn colorectal cancer (cell)
HCC-S102	hepatocellular carcinoma (cell)
HCT	hmn colorectal cancer (cell)
HCT8	hmn colorectal cancer (cell)
HCT15	hmn colorectal cancer (cell)
HCT29	hmn colon adenocarcinoma (cell)
HCT116	hmn colorectal cancer (cell)
HCT116/mdr+	overexpress mdr+ hmn colorectal cancer (cell)
HCT116/topo	resistant to etoposide hmn colorectal cancer (cell)
HCT116/VM46	multidrug-resistant colorectal cancer (cell)
HEK-293	normal hmn epithelial kidney cells
HEL	hmn embryonic lung fibrocytes
HeLa	hmn cervical epithelial carcinoma (cell)
HeLa-APL	hmn cervical epithelial cancer (cell)
HeLa-S3	hmn cervical epithelial cancer (cell)
Hep2	hmn liver carcinoma (cell)
Hep3B	hmn liver cancer (cell)
HepA	hmn liver cancer ascites (cell)
Hepa1c1c7	mus liver cancer (cell)
HepG	hmn liver cancer (cell)
HepG2	hmn liver cancer (cell)

HepG3	hmn liver cancer (cell)
HepG3B	hmn liver cancer (cell)
HEY	hmn ovarian carcinoma (cell)
HFF	hmn foreskin fibroblasts
HL60	hmn promyelocytic leukemia (cell)
HL7702	hmn liver tumor (cell)
HLF	hmn lung fibroblasts
HM02	hmn gastric adenocarcinoma (cell)
HMEC	hmn microvascular endothelial cells
HMEC1	hmn microvascular endothelial cells
HNXF-536L	hmn head and neck cancer (cell)
HOP-18	hmn nonsmall cell lung cancer (cell)
HOP-62	hmn nonsmall cell lung cancer (cell)
HOP-92	hmn nonsmall cell lung cancer (cell)
Hs578T	hmn breast cancer (cell)
Hs683	hmn oligodendroglioma (black dots) (cell)
HSV-1	nonmalignant cell
HT	hmn lymphoma (cell)
HT29	hmn colorectal cancer (cell)
HL60	M. Daferner, et al., Z. Naturforsch., Teil C, 1999, 54, 474
HT115	hmn colorectal cancer (cell)
HT460	hmn tumor (cell)
HT1080	hmn fibrosarcoma (cell)
HTC116	hmn acute promyelocytic leukemia (cell)
HTCLs	hmn tumors (cells)
HuCCA-1	hmn cholangiocarcinoma cancer (cell)
Huh7	hmn hepatoma (cell)
HUVEC	hmn umbilical vein endothelial cell
HUVECs	hmn umbilical vein endothelial cell
IC-2 <sup>WT</sup>	murine cell line
IGR-1	hmn melanoma (cell)
IGROV	hmn ovarian cancer (cell)
IGROV1	hmn ovarian cancer (cell)
IGROV-ET	hmn ovarian cancer (cell)
IMR-32	hmn neuroblastoma (cell)
IMR-90	hmn diploid lung fibroblasts
J774	mus monocyte/macrophage (cell)
J774.1	mus monocyte/macrophage (cell)
J774.A1	mus monocyte/macrophage (cell)
JB6 Cl41	mouse epidermal cells
JB6 P <sup>+</sup> Cl41	mouse epidermal cells
JurKat	hmn leukemia (cell)
JurKat-T	hmn T-cell leukemia (cell)
K462	hmn leukemia (cell)
K562	hmn chronic myelogenous leukemia (cell)
KB	hmn nasopharyngeal carcinoma (cell)
KB16	hmn nasopharyngeal carcinoma (cell)
KB-3	hmn <i>epidermoid</i> carcinoma (cell)
KB-3-1	hmn <i>epidermoid</i> carcinoma (cell)

KB-C2	hmn carcinoma (cell)
KB-CV60	hmn carcinoma (cell)
KBV200	MDR nasopharyngeal carcinoma (cell)
Ketr3	hmn renal cancer (cell)
KM12	hmn colorectal cancer (cell)
KM20L2	hmn colorectal cancer (cell)
KMS34	hmn myeloma (cell)
KU812F	hmn leukemia (cell)
KV/MDR	multidrug-resistant cancer (cell)
KYSE30	hmn esophageal cancer (cell)
KYSE70	hmn esophageal cancer (cell)
KYSE180	hmn esophageal cancer (cell)
KYSE520	hmn esophageal cancer (cell)
L <sub>1210</sub>	mouse lymphocytic leukemia (cell)
L <sub>1210</sub> /Dx	doxorubicin-resistant L <sub>1210</sub> (cell)
L363	hmn myeloma (cell)
L-428	leukemia (cell)
L5178	mouse lymphosarcoma (cell)
L5178Y	mouse lymphosarcoma (cell)
L-6	rat skeletal myoblasts (cell)
L929	mouse fibroblasts
LLC-PK <sub>1</sub>	pig kidney cells
LMM3	mouse mammary adenocarcinoma (cell)
LNCaP	hmn prostate cancer (cell)
LO2	hmn liver cells
LoVo	hmn colorectal cancer (cell)
LoVo-DOX	hmn colorectal cancer (cell)
LOX	hmn melanoma (cell)
LOX-IMVI	hmn melanoma (cell)
LX-1	hmn lung cancer (cell)
LXF-1121L	hmn lung cancer (cell)
LXF-289L	hmn lung cancer (cell)
LXF-526L	hmn lung cancer (cell)
LXF-529L	hmn lung cancer (cell)
LXF-629L	hmn lung cancer (cell)
LXFA-629L	lung adenocarcinoma (cell)
LXF-H460	hmn lung cancer (cell)
M14	melanoma (cell)
M16	murine colon adenocarcinoma (cell)
M17	adriamycin-resistant breast cancer (cell)
M17-Adr	adriamycin-resistant breast cancer (cell)
M21	melanoma (cell)
M5076	ovarian sarcoma (cell)
MAGI	Hela-CD4-LTR- $\beta$ -gal (indicator) cells containing HIV-1 IIIB virus
MALME-3	melanoma (cell)
MALME-3M	melanoma (cell)
MAXF-401	hmn breast cancer (cell)
MAXF-401NL	hmn breast cancer (cell)
MAXF-MCF7	hmn breast cancer (cell)

**XXXVIII** — List of Cancer Cell Codes

MCF	hmn breast cancer (cell)
MCF-10A	hmn breast epithelial (cell)
MCF7	hmn breast cancer (cell)
MCF7 Adr	drug-resistant hmn breast MCF7 cancer (cell)
MCF7/Adr	drug-resistant hmn breast MCF7 cancer (cell)
MCF7/ADR-RES	drug-resistant hmn breast cancer MCF7 (cell)
MCF12	hmn esophageal cancer (cell)
MDA231	hmn breast cancer (cell)
MDA361	hmn breast cancer (cell)
MDA435	hmn breast cancer (cell)
MDA468	hmn breast cancer (cell)
MDA-MB	hmn breast cancer (cell)
MDA-MB-231	hmn breast cancer (cell)
MDA-MB-231/ATCC	hmn breast cancer (cell)
MDA-MB-435	hmn breast cancer (cell)
MDA-MB-435s	hmn breast cancer (cell)
MDA-MB-468	hmn breast cancer (cell)
MDA-N	hmn breast cancer (cell)
MDCK	Madin–Darby canine (cell)
ME180	cervical cancer (cell)
MEL28	hmn melanoma (cell)
MES-SA	hmn uterine (cell)
MES-SA/DX5	hmn uterine (cell)
MEXF-276L	hmn melanoma (cell)
MEXF-394NL	hmn melanoma (cell)
MEXF-462NL	hmn melanoma (cell)
MEXF-514L	hmn melanoma (cell)
MEXF-520L	hmn melanoma (cell)
MG63	hmn osteosarcoma (cell)
MGC-803	hmn cancer (cell)
MiaPaCa	hmn pancreas cancer (cell)
Mia-PaCa-2	hmn pancreas cancer (cell)
MKN1	hmn gastric cancer (cell)
MKN7	hmn gastric cancer (cell)
MKN28	hmn gastric cancer (cell)
MKN45	hmn gastric cancer (cell)
MKN74	hmn gastric cancer (cell)
MM1S	hmn myeloma (cell)
Molt3	leukemia (cell)
Molt4	hmn T lymphocyte leukemia (cell)
Mono-Mac-6	mononuclear cells
MPM ACC-MESO-1	hmn malignant pleural mesothelioma
MRC-5	normal hmn diploid embryonic cells
MRC5CV1	SV40-transformed hmn fibroblasts
MS-1	mice endothelial cells
MX-1	hmn mammary carcinoma xenografts
N18-RE-105	neuronal hybridoma (cell)
N18-T62	mus neuroblastoma (cell)
NAMALWA	leukemia (cell)

NBT-T2 (BRC-1370)	rat bladder epithelial cells
NCI-ADR	hmn ovarian sarcoma (cell)
NCI-ADR-Res	hmn ovarian sarcoma (cell)
NCI-H23	hmn nonsmall cell lung cancer (cell)
NCI-H69	hmn lung cancer (cell)
NCI-H82	hmn lung cancer (cell)
NCI-H187	hmn small cell lung cancer (cell)
NCI-H226	hmn nonsmall cell lung cancer (cell)
NCI-H322M	hmn nonsmall cell lung cancer (cell)
NCI-H446	hmn lung cancer (cell)
NCI-H460	hmn nonsmall cell lung cancer (cell)
NCI-H510	hmn lung cancer (cell)
NCI-H522	hmn nonsmall cell lung cancer (cell)
neuro-2a	mouse neuroblastoma (cell)
NFF	nonmalignant neonatal foreskin fibroblasts
NHDF	normal hmn dermal fibroblasts
NIH3T3	nontransformed fibroblasts
NIH3T3	normal fibroblasts
NMuMG	nontransformed epithelial cells
NOMO-1	hmn acute myeloid leukemia
NS-1	murine cells
NSCLC	hmn bronchopulmonary nonsmall cell lung cancer
NSCLC HOP-92	hmn nonsmall cell lung cancer (cell)
NSCLC-L16	hmn bronchopulmonary nonsmall cell lung carcinoma
NSCLC-N6	hmn bronchopulmonary nonsmall cell lung cancer (cell)
NSCLC-N6-L16	hmn bronchopulmonary nonsmall cell lung carcinoma
NUGC-3	hmn gastric cancer (cell)
OCILY17R	hmn lymphoma (cell)
OCIMY5	hmn myeloma (cell)
OPM2	hmn myeloma (cell)
OVCAR-3	ovarian adenocarcinoma (cell)
OVCAR-4	ovarian adenocarcinoma (cell)
OVCAR-5	ovarian adenocarcinoma (cell)
OVCAR-8	ovarian adenocarcinoma (cell)
OVXF-1619L	ovary cancer (cell)
OVXF-899L	ovary cancer (cell)
OVXF-OVCAR3	ovary cancer (cell)
P <sub>388</sub>	mus lymphocytic leukemia (cell)
P <sub>388</sub> /ADR	P <sub>388</sub> adriamycin-resistant (cell)
P <sub>388</sub> /Dox	mus leukemia cells expressing resistance toward doxorubicin
P <sub>388</sub> D1	mus macrophage cells
PANC1	hmn pancreas cancer (cell)
panc89	pancreatic cancer (cell)
PAXF-1657L	hmn pancreas cancer (cell)
PAXF-PANC1	hmn pancreas cancer (cell)
PBMC	hmn normal peripheral blood mononuclear cells
PC12	hmn lung cancer (cell)
PC-12	rat pheochromocytoma (cell)
PC3	hmn prostate cancer (cell)



**XL** — List of Cancer Cell Codes

PC3M	hmn prostate cancer (cell)
PC3MM2	hmn prostate cancer (cell)
PC-9	hmn lung cancer (cell)
PRXF-22RV1	hmn prostate cancer (cell)
PRXF-DU145	hmn prostate cancer (cell)
PRXF-LNCAP	hmn prostate cancer (cell)
PRXF-PC3M	hmn prostate cancer (cell)
PS (=P <sub>388</sub> )	PS system, P <sub>388</sub> mouse lymphocytic leukemia (cell)
PV1	nonmalignant cell
PXF-1752L	mesothelioma cancer (cell)
QG56	hmn lung carcinoma (cell)
QGY-7701	hmn hepatocellular carcinoma (cell)
QGY-7703	hmn liver cancer (cell)
Raji	hmn EBV-transformed Burkitt's lymphoma B cell
RAW264.7	mouse macrophages
RB	hmn prostate cancer (cell)
RBL-2H3	rat basophilic cells
RF-24	papillomavirus 16 E6/E7 immortalized hmn umbilical vein cells
RKO	hmn colon cancer (cell)
RKO-E6	hmn colon cancer (cell)
RPMI7951	hmn malignant melanoma (cell)
RPMI8226	hmn myeloma (cell)
RXF-1781L	renal cancer (cell)
RXF-393	renal cancer (cell)
RXF-393NL	renal cancer (cell)
RXF-486L	renal cancer (cell)
RXF-631L	renal cancer (cell)
RXF-944L	renal cancer (cell)
S <sub>180</sub>	mouse sarcoma (cell)
S <sub>180A</sub>	sarcoma 180 ascite cells
SAS	hmn oral cancer
SCHABEL	mouse lymphoma cancer (cell)
SF268	hmn brain tumor (cell)
SF295	hmn brain tumor (cell)
SF539	hmn brain tumor (cell)
SGC7901	hmn gastric cancer (cell)
SH-SY5Y	hmn neuroblastoma (cell)
SK5-MEL	hmn melanoma (cell)
SKBR3	hmn breast cancer (cell)
SK-Hep1	hmn liver carcinoma (cell)
SK-MEL-2	hmn melanoma (cell)
SK-MEL-5	hmn melanoma (cell)
SK-MEL-28	hmn melanoma (cell)
SK-MEL-S	hmn melanoma (cell)
SK-N-SH	neuroblastoma (cell)
SK-OV-3	ovarian adenocarcinoma (cell)
SMMC-7721	hmn liver cancer (cell)

SN12C	hmn renal cancer (cell)
SN12K1	hmn renal cancer (cell)
SNB19	hmn brain tumor (cell)
SNB75	hmn CNS cancer (cell)
SNB78	hmn brain tumor (cell)
SNU-C4	hmn cancer (cell)
SR	leukemia (cell)
St4	gastric cancer (cell)
stromal cell	bone marrow stromal cells
SUP-B15	leukemia (cell)
Sup-T1	T-cell lymphoma cancer cells
SW480	hmn colorectal adenocarcinoma (cell)
SW620	hmn colorectal adenocarcinoma (cell)
SW1573	hmn nonsmall cell lung cancer (cell)
SW1736	hmn thyroid cancer (cell)
SW1990	hmn pancreatic cancer (cell)
T24	hmn liver cancer (cell)
T-24	hmn transitional bladder carcinoma (cell)
T47D	hmn breast cancer (cell)
THP-1	hmn acute monocytic leukemia (cell)
TK10	hmn renal cancer (cell)
tMDA-MB-231	hmn breast cancer (cell)
tsFT210	mouse cancer (cell)
TSU-Pr1	invasive bladder cancer (cell)
TSU-Pr1-B1	invasive bladder cancer (cell)
TSU-Pr1-B2	invasive bladder cancer (cell)
U251	CNS tumor/glioma (cell)
U266	myeloma (cell)
U20S	hmn osteosarcoma (cell)
U373	glioblastoma/astrocytoma (cell)
U373MG	hmn brain cancer (cell)
U-87-MG	caucasian glioblastoma (cell)
U937	hmn monocytic leukemia (cell)
UACC-257	melanoma (cell)
UACC62	melanoma (cell)
UO-31	hmn renal cancer (cell)
UT7	hmn leukemia (cell)
UV20	DNA cross-linking agent-sensitive Chinese hamster ovary (cell)
UXF-1138L	hmn uterus cancer (cell)
V79	Chinese hamster (cell)
Vero	green monkey kidney tumor (cell)
WEHI-164	mus fibrosarcoma (cell)
WHCO1	hmn esophageal cancer (cell)
WHCO5	hmn esophageal cancer (cell)
WHCO6	hmn esophageal cancer (cell)
WI26	hmn lung fibroblasts
WiDr	hmn colon adenocarcinoma (cell)

**XLII** — List of Cancer Cell Codes

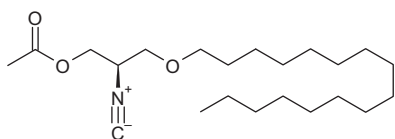
WMF	hmn prostate cancer (cell)
XF498	hmn CNS cancer (cell)
XRS-6	topoisomerase II-sensitive Chinese hamster ovary (cell)
XVS	topoisomerase II-sensitive CHO cell
ZR-75-1	hmn breast cancer (cell)

# 1 Aliphatic Metabolites

## 1.1 Saturated Aliphatic Chain Compounds

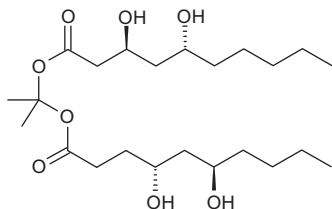
### 1 Actisonitrile

Type: Unbranched saturated aliphatic compounds.  $C_{22}H_{41}NO_3$  Source: Nudibranch *Actinocyclus papillatus* (Weizhou I., Guangxi, China). Pharm: Cytotoxic (H9c2,  $IC_{50} = (23 \pm 6)\mu\text{mol/L}$ ). Ref: E. Manzo, et al, Org. Lett., 2011, 13, 1897



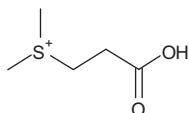
### 2 Aureobasidin

Type: Unbranched saturated aliphatic compounds.  $C_{23}H_{44}O_8$  Amorph. powder. Source: Marine-derived fungus *Aureobasidium* sp. from marine aquatic plant *Posidonia oceanica*. Pharm: Antifoulant; inhibits larval settlement (*Balanus amphitrite* larvae); antibacterial (*Staphylococcus aureus*, *Escherichia coli* and *Bacillus subtilis*). Ref: A. Abdel-Lateff, et al, Nat. Prod. Commun., 2009, 4, 389



### 3 (2-Carboxyethyl)dimethylsulfonium(1+)

Dimethyl- $\beta$ -propiethetin Type: Unbranched saturated aliphatic compounds.  $C_5H_{11}O_2S^{1+}$  Needles (EtOH) (chloride), mp 134 °C (dec), mp 129 °C, pKa 3.35. Source: Green algae *Ulva lactuca* and *Enteromorpha intestinalis*. Pharm: Feeding stimulant (fish). Ref: S. Sciuto, et al, JNP, 1988, 51, 322

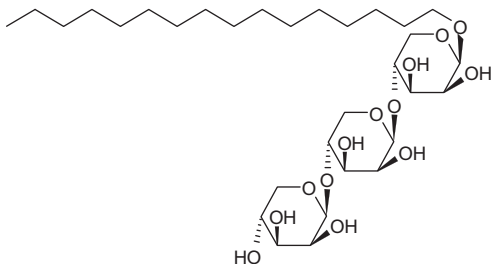


### 4 Cervicoside

1-Hexadecanol *O*-[ $\beta$ -D-Arabinopyranosyl-(1 $\rightarrow$ 4)- $\beta$ -D-arabinopyranosyl-(1 $\rightarrow$ 4)- $\beta$ -D-arabinopyranoside] Type: Unbranched saturated aliphatic compounds.  $C_{31}H_{58}O_{13}$  Source:

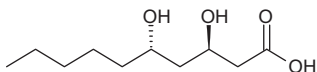
<https://doi.org/10.1515/9783110655797-001>

Soft coral *Simularia cervicornis*. Pharm: Cytotoxic. Ref: X. -X. He, et al, Zhongshan Daxue Xuebao Ziran Kexueban, 2002, 41, 114; CA, 137, 198514j



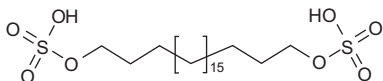
### 5 (3R,5S)-3,5-Dihydroxydecanoic acid

Type: Unbranched saturated aliphatic compounds.  $C_{10}H_{20}O_4$  Yellowish oil. Source: Marine-derived fungus *Aureobasidium* sp. from marine aquatic plant *Posidonia oceanica*. Pharm: Inhibits larval settlement (*Balanus amphitrite* larvae); antibacterial (*Staphylococcus aureus*, *Escherichia coli* and *Bacillus subtilis*). Ref: A. Abdel-Lateff, et al, Nat. Prod. Commun., 2009, 4, 389



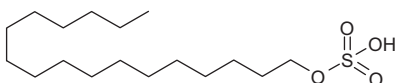
### 6 Heneicosane-1,21-diyl disulfate

Type: Unbranched saturated aliphatic compounds.  $C_{21}H_{44}O_8S_2$  Source: Ascidian *Ascidia mentula* (Mediterranean Sea). Pharm: Antiproliferative (IGR-1,  $IC_{50} \approx 100 \mu\text{g/mL}$ ; J774,  $IC_{50} \approx 170 \mu\text{g/mL}$ ; WEHI-164,  $IC_{50} \approx 150 \mu\text{g/mL}$ ; P<sub>388</sub>,  $IC_{50} \approx 260 \mu\text{g/mL}$ ). Ref: A. Aiello, et al, Tetrahedron, 1997, 53, 5877



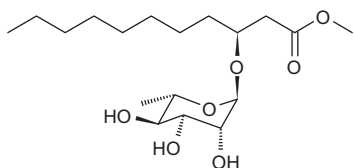
### 7 1-Heptadecanyl-O-sulfate

Type: Unbranched saturated aliphatic compounds.  $C_{17}H_{36}O_4S$  Amorph. solid (Na salt). Source: Ascidian *Sidnyum turbinatum* (Mediterranean Sea). Pharm: Antiproliferative (*in vitro*, WEHI-164,  $IC_{50} = (400 \pm 1) \mu\text{g/mL}$ , control 6-Mercaptopurine,  $IC_{50} = (1.30 \pm 0.02) \mu\text{g/mL}$ ). Ref: A. Aiello, et al, JNP, 2001, 64, 219

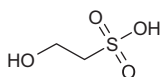


**8 R-3-Hydroxyundecanoic acid methylester-3-O- $\alpha$ -L-rhamnopyranoside**

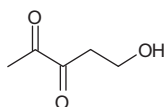
Type: Unbranched saturated aliphatic compounds.  $C_{18}H_{34}O_7$  Source: Marine-derived fungus from Mangrove *Scyphiphora hydrophyllacea* A1. Pharm: Antibacterial (*Staphylococcus aureus*, IZD = 9.8 mm, MRSA, IZD = 10.7 mm). Ref: Y. B. Zeng, et al, Mar. Drugs, 2012, 10, 598

**9 Isethionic acid**

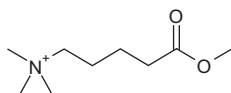
2-Sulfoethyl alcohol Type: Unbranched saturated aliphatic compounds.  $C_2H_6O_4S$  Syrup. Source: Red alga *Ceramium flaccidum*, squid. Pharm: Irritant (eye, skin, and mucous membrane);  $LD_{50}$  (mus, ipr) = 50 mg/kg. Ref: K. D. Barrow, et al, Phytochemistry, 1993, 34, 1429

**10 Laurencione (open-chain form)**

5-Hydroxy-pentane-2,3-dione Type: Unbranched saturated aliphatic compounds.  $C_5H_8O_3$  Light green oil. Source: Red alga *Laurencia spectabilis* (Oregon). Pharm: Toxic (brine shrimp). Ref: M. W. Bernart, et al, Phytochemistry, 1992, 31, 1273

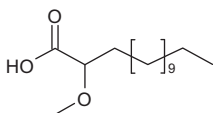
**11 (4-Methoxycarbonylbutyl)-trimethylammonium chloride**

Type: Unbranched saturated aliphatic compounds.  $C_9H_{20}NO_2^{+}$  Cryst. (chloride). Source: Cockle *Austrovenus stutchburyi* (New Zealand). Pharm: Neurotoxin;  $LD_{50}$  (mus, ipr) = 30 mg/kg. Ref: H. Ishida, et al, Toxicol, 1994, 32, 1672

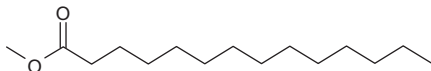


**12 2-Methoxytetradecanoic acid**

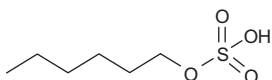
Type: Unbranched saturated aliphatic compounds.  $C_{15}H_{30}O_3$  Source: Sponge *Callyspongia fallax* (Caribbean Sea). Pharm: Antifungal. Ref: N. M. Carballeira, et al, JNP, 2001, 64, 620

**13 Methyl myristate**

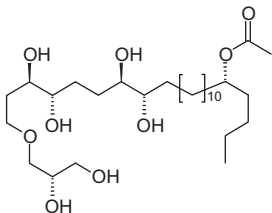
Type: Unbranched saturated aliphatic compounds.  $C_{16}H_{30}O_2$  Source: Deep-sea fungus *Paecilomyces lilacinus* ZBY-1. Pharm: Cytotoxic (100  $\mu\text{g}/\text{mL}$ : K562, MCF7, HL60, and BGC823, InRt = 30%–80%). Ref: X. Cui, et al, J. Int. Pharm. Res., 2013, 40, 765 (in Chinese)

**14 Monohexyl sulfate**

Type: Unbranched saturated aliphatic compounds.  $C_6H_{14}O_4S$  mp 83–84.5 °C (S-benzylthiuronium salt). Source: Ascidian *Sidnyum turbinatum* (Mediterranean Sea). Pharm: Antiproliferative (*in vitro*, WEHI-164,  $IC_{50} = (150 \pm 2)\mu\text{g}/\text{mL}$ , control 6-Mercaptopurine,  $IC_{50} = (1.30 \pm 0.02)\mu\text{g}/\text{mL}$ ). Ref: A. Aiello, et al, JNP, 2001, 64, 219

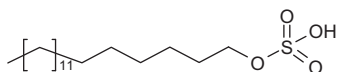
**15 Mycalol**

Type: Unbranched saturated aliphatic compounds.  $C_{29}H_{58}O_9$  Source: Sponge *Mycale acerata* (Terra Nova Bay, Antarctica). Pharm: Cytotoxic (specific inhibitor of hmn anaplastic thyroid carcinomas – most aggressive and currently untreatable thyroid gland malignancies); cytotoxic inactive (other solid tumours). Ref: A. Cutignano, et al, Angew. Chem., Int. Ed., 2013, 52, 9256

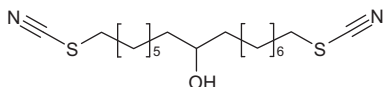


**16 Octadecyl hydrogen sulfate**

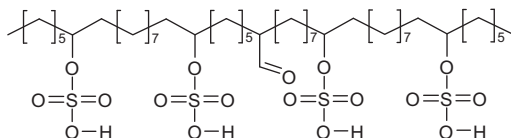
**Type:** Unbranched saturated aliphatic compounds.  $C_{18}H_{38}O_4S$  Hygroscopic cryst., mp 54.1–55.5 °C (sealed tube). **Source:** Ascidian *Sidnyum turbinatum* (Mediterranean Sea). **Pharm:** Antiproliferative (*in vitro*, WEHI-164,  $IC_{50} = (410 \pm 1)\mu\text{g/mL}$ , control 6-Mercaptopurine,  $IC_{50} = (1.30 \pm 0.02)\mu\text{g/mL}$ ). **Ref:** A. Aiello, et al, JNP, 2001, 64, 219

**17 Thiocyanatin A**

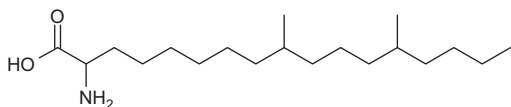
**Type:** Unbranched saturated aliphatic compounds.  $C_{18}H_{32}N_2OS_2$  Oil. **Source:** Sponge *Oceanapia* sp. (off Northern Rottneest Shelf, Australia). **Pharm:** Nematocide (commercial livestock parasite *Haemonchus contortus*,  $LD_{99} = 1.3 \mu\text{g/mL}$ ). **Ref:** R. J. Capon, et al, JOC, 2001, 66, 7765

**18 Toxadocial A**

**Type:** Unbranched saturated aliphatic compounds.  $C_{48}H_{96}O_{17}S_4$  Amorph. solid (tetra-Na salt),  $[\alpha]_D = -2.2^\circ$  ( $c = 1$ , MeOH) (tetra-Na salt). **Source:** Sponge *Toxadocia cylindrica*. **Pharm:** Thrombin inhibitor. **Ref:** Y. Nakao, et al, Tet. Lett., 1993, 34, 1511

**19 2-Amino-9,13-dimethylheptadecanoic acid**

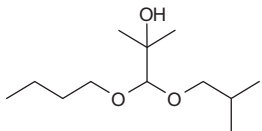
Antibiotic 1010-F1 **Type:** Branched saturated aliphatic compounds.  $C_{19}H_{39}NO_2$  **Source:** Marine-derived streptomycete *Streptomyces* sp. 1010 (cold water, shallow water sediment, near Livingston I., Antarctic). **Pharm:** Antibacterial (*Bacillus subtilis*, MIC = 50  $\mu\text{g/mL}$ ; *Micrococcus luteus*, MIC = 15  $\mu\text{g/mL}$ ). **Ref:** V. Ivanova, et al, Z. Naturforsch., C, 2001, 56, 1 | M. D. Lebar, et al, NPR, 2007, 24, 774 (rev)



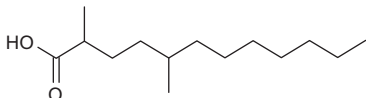


**20 1-Butoxy-2-methyl-1-(2-methylpropoxy)-2-propanol**

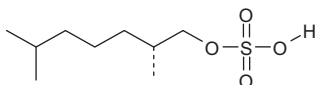
**Type:** Branched saturated aliphatic compounds.  $C_{12}H_{26}O_3$  Oil,  $[\alpha]_D^{25} = +0.1^\circ$  ( $c = 0.35$ ,  $CHCl_3$ ). **Source:** Marine bacterium *Vibrio angustum* S14. **Pharm:** Induces both acylated homoserine lactone (AHL) regulatory system in *Agrobacterium tumefaciens* and bioluminescence in *Vibrio harveyi*. **Ref:** R. De Nys, et al, JNP, 2001, 64, 531

**21 2,5-Dimethyldodecanoic acid**

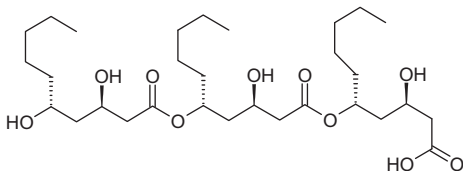
2,5-Dimethylauric acid **Type:** Branched saturated aliphatic compounds.  $C_{14}H_{28}O_2$   $[\alpha]_D^{22} = -9.4^\circ$  ( $c = 4.4$ , MeOH). **Source:** Cyanobacterium *Lyngbya aestuarii*. **Pharm:** Herbicide. **Ref:** M. Entzeroth, et al, Phytochemistry, 1985, 24, 2875

**22 2,6-Dimethylheptyl sulfate**

**Type:** Branched saturated aliphatic compounds.  $C_9H_{20}O_4S$  Amorph. (Na or K salt),  $[\alpha]_D = +4.7^\circ$  ( $c = 0.01$ , MeOH). **Source:** Ascidians *Halocynthia roretzi* (Japan waters), *Polycitorella adriaticus* (Croatia) and *Polycitor afriaticus* (Mediterranean Sea). **Pharm:** Cytotoxic. **Ref:** A. Crispino, et al, JNP, 1994, 57, 1575 | S. De Rosa, et al, JNP, 1997, 60, 462

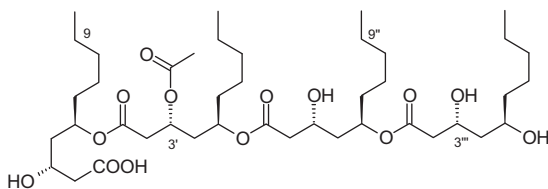
**23 Exophilin A**

**Type:** Branched saturated aliphatic compounds.  $C_{30}H_{56}O_{10}$  Viscous oil,  $[\alpha]_D^{27} = -22.3^\circ$  ( $c = 1$ ,  $CHCl_3$ ). **Source:** Marine-derived fungus *Exophiala pisciphila* N110102 from sponge *Mycale adhaerens*. **Pharm:** Antibacterial. **Ref:** J. Doshida, et al, J. Antibiot., 1996, 49, 1105

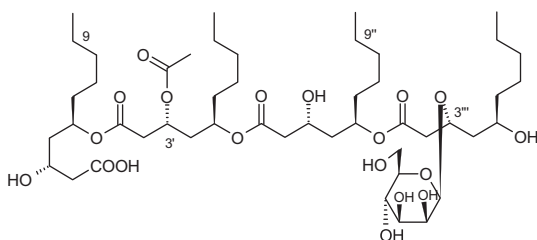


**24 Halymecin A**

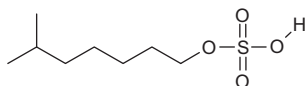
**Type:** Branched saturated aliphatic compounds.  $C_{42}H_{76}O_{14}$  Oil,  $[\alpha]_D^{26} = -4.3^\circ$  ( $c = 1.5$ ,  $CH_2Cl_2$ ). **Source:** Marine-derived fungus *Fusarium* sp. FE-71-1 from alga *Halymenia dilatata* (Palau, Oceania). **Pharm:** Antimicroalgal. **Ref:** C. Chen, et al, J. Antibiot., 1996, 49, 998

**25 Halymecin B**

**Type:** Branched saturated aliphatic compounds.  $C_{48}H_{86}O_{19}$  Oil,  $[\alpha]_D^{26} = -24.4^\circ$  ( $c = 6.6$ ,  $CH_2Cl_2$ ). **Source:** Marine-derived fungus *Fusarium* sp. FE-71-1 from red alga *Halymenia dilatata* (Palau, Oceania). **Pharm:** Antimicroalgal. **Ref:** C. Chen, et al, J. Antibiot., 1996, 49, 998

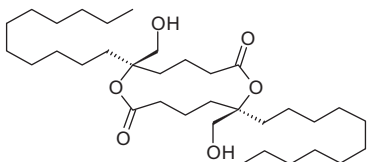
**26 6-Methylheptyl sulfate**

**Type:** Branched saturated aliphatic compounds.  $C_8H_{18}O_4S$  Colorless amorph. solid. **Source:** Ascidian *Halocynthia papillosa* (Mediterranean Sea). **Pharm:** Cytotoxic (WEHI-164,  $IC_{50} = (15.0 \pm 1)\mu g/mL$ ; C6,  $IC_{50} = (545.4 \pm 7.5)\mu g/mL$ ). **Ref:** A. Aiello, et al, JNP, 2000, 63, 1590

**27 Tanikolide dimer**

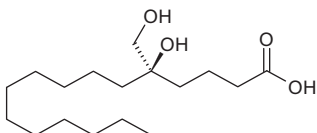
6,12-Bis(hydroxymethyl)-6,12-diundecyl-1,7-dioxacyclododecane-2,8-dione **Type:** Branched saturated aliphatic compounds.  $C_{34}H_{64}O_6$   $[\alpha]_D^{25} = +2.9^\circ$  ( $c = 0.25$ ,  $CHCl_3$ ). **Source:** Cyanobacterium *Lyngbya majuscula* (Tanikely I., Madagascar). **Pharm:** Hmn sirtuin type 2 (SIRT2) inhibitor (selective,  $IC_{50} = 176$  nmol/L in one

assay format and 2.4  $\mu\text{mol/L}$  in another, potent). Ref: M. Gutiérrez, et al, JOC, 2009, 74, 5267



### 28 Tanikolide secoacid

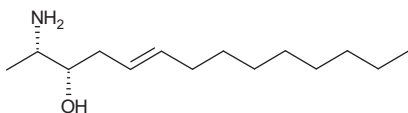
5-Hydroxy-5-(hydroxymethyl)hexadecanoic acid (Secotanikolide) Type: Branched saturated aliphatic compounds.  $\text{C}_{17}\text{H}_{34}\text{O}_4$  Cryst.,  $[\alpha]_{\text{D}}^{25} = -10^\circ$  ( $c = 0.87$ ,  $\text{CHCl}_3$ ). Source: Cyanobacterium *Lyngbya majuscula* (Tanikely I., Madagascar). Pharm: Cytotoxic (H460 cancer cell line, moderate). Ref: M. Gutiérrez, et al, JOC, 2009, 74, 5267



## 1.2 Alkenic Compounds

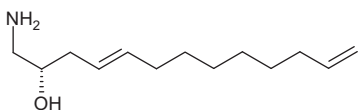
### 29 2-Amino-5-tetradecen-3-ol

Type: Unbranched alkenic compounds.  $\text{C}_{14}\text{H}_{29}\text{NO}$  Source: Ascidian *Pseudodistoma* sp. (South Africa). Pharm: Antimicrobial. Ref: G. J. Hooper, et al, Nat. Prod. Lett., 1995, 6, 31



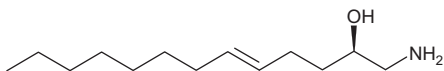
### 30 1-Amino-4,12-tridecadien-2-ol

Type: Unbranched alkenic compounds.  $\text{C}_{13}\text{H}_{25}\text{NO}$  Source: Ascidian *Pseudodistoma* sp. (South Africa). Pharm: Antimicrobial. Ref: G. J. Hooper, et al, Nat. Prod. Lett., 1995, 6, 31

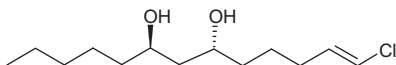


**31 (2R,5E)-1-Amino-5-tridecen-2-ol**

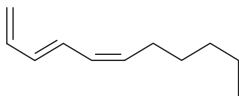
Type: Unbranched alkenic compounds.  $C_{13}H_{27}NO$   $[\alpha]_D = +1.9^\circ$  ( $c = 0.4$ , MeOH) (trifluoroacetate salt). Source: Ascidian *Didemnum* sp. (Great Barrier Reef). Pharm: Antifungal. Ref: P. A. Searle, et al, JOC, 1993, 58, 7578

**32 (-)-(E)-1-Chlorotridec-1-ene-6,8-diol**

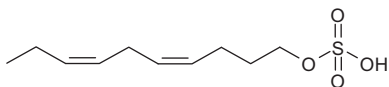
Type: Unbranched alkenic compounds.  $C_{13}H_{25}ClO_2$  Cryst. (pentane), mp 55.7–58 °C,  $[\alpha]_D^{27} = -12.2^\circ$  ( $c = 3.3$ ,  $CHCl_3$ ). Source: Cyanobacteria *Schizothrix calcicola* and *Oscillatoria nigroviridis*. Pharm: Non-toxic metabolite. Ref: J. S. Mynderse, et al, Phytochemistry, 1978, 17, 1325

**33 Cystophorene**

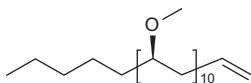
Galbanolene Type: Unbranched alkenic compounds.  $C_{11}H_{18}$  Source: Brown alga *Cystophora siliquosa*. Pharm: Sperm attractant. Ref: D. G. Müller, et al, Naturwissenschaften, 1985, 72, 97

**34 4Z,7Z-Decadien-1-ol-O-sulfate**

Type: Unbranched alkenic compounds.  $C_{10}H_{18}O_4S$  Source: Ascidian *Halocynthia roretzi* (Japan waters). Pharm: Antimicrobial; antifungal; kairomone. Ref: A. Crispino, et al, JNP, 1994, 57, 1575

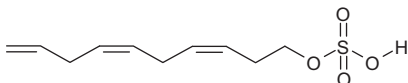
**35 4,6,8,10,12,14,16,18,20,22-Decamethoxy-1-heptacosene**

Type: Unbranched alkenic compounds.  $C_{37}H_{74}O_{10}$  Source: Cyanobacterium *Tolypothrix conglutinata* var. *chlorata* (Fanning I., Kiribati, Oceania). Pharm: Toxin. Ref: J. S. Mynderse, et al, Phytochemistry, 1979, 18, 1181



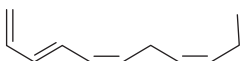
### 36 3Z,6Z,9-Decatrien-1-ol-O-sulfate

**Type:** Unbranched alkenic compounds.  $C_{10}H_{16}O_4S$  **Source:** Ascidian *Halocynthia roretzi* (Japan waters). **Pharm:** Antimicrobial. **Ref:** S. Tsukamoto, et al, JNP, 1994, 57, 1606



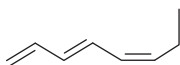
### 37 Finavarrene

(3E,5Z,8Z)-Undeca-1,3,5,8-tetraene **Type:** Unbranched alkenic compounds.  $C_{11}H_{16}$  Liquid,  $n_D^{14} = 1.5285$  **Source:** Brown algae *Ascophyllum nodosum*, *Dictyopteris plagiogramma* and *Spermatochnus paradoxus*. **Pharm:** Smelling principle of gametes of brown algae (genera *Dictyopteris* and *Spermatochnus paradoxus*); sperm attractant. **Ref:** D. G. Müller, et al, Naturwissenschaften, 1981, 67, 478 | D. G. Müller, et al, Science, 1982, 218, 1119



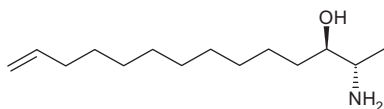
### 38 Fucoserratene

(3E,5Z)-Octa-1,3,5-triene **Type:** Unbranched alkenic compounds.  $C_8H_{12}$  bp<sub>40mmHg</sub> 56 °C. **Source:** Brown alga *Fucus sarratus*. **Pharm:** Female sex attractant. **Ref:** D. G. Müller, et al, FEBS Lett., 1973, 30, 137



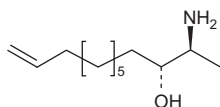
### 39 Halaminol A

(2S)-Amino-13-tetradecen-(3R)-ol **Type:** Unbranched alkenic compounds.  $C_{14}H_{29}NO$   $[\alpha]_D = +1.7^\circ$  ( $c = 0.04$ ,  $CH_2Cl_2$ ). **Source:** Sponge *Haliclona* sp. (Queensland). **Pharm:** Antifungal (standard paper disk assay, *Trichophyton mentagrophytes*, IZD = 10 mm); larval settling inducer (ascidians, rapid, prevents subsequent metamorphosis; for larvae of other phyla, inhibits settlement and was toxic). **Ref:** R. J. Clark, et al, JNP, 2001, 64, 1568. | K. E. Roper, et al, Mar. Biotechnol., 2009, 11, 188.



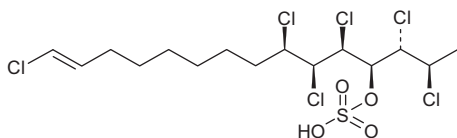
#### 40 Halaminol B 2-Amino-11-dodecen-3-ol

**Type:** Unbranched alkenic compounds.  $C_{12}H_{25}NO$  Oil,  $[\alpha]_D = +2.1^\circ$  ( $c = 0.06$ ,  $CH_2Cl_2$ ).  
**Source:** Sponge *Haliclona* sp. (Queensland). **Pharm:** Antifungal (standard paper disk assay, *Trichophyton mentagrophytes*, IZD = 10 mm). **Ref:** R. J. Clark, et al, JNP, 2001, 64, 1568



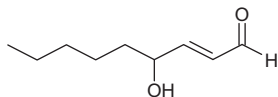
#### 41 Hexachlorosulfolipid

2,3,5,6,7,15-Hexachloro-14-pentadecen-4-ol **Type:** Unbranched alkenic compounds.  $C_{15}H_{24}Cl_6O_4S$   $[\alpha]_D^{25} = +20.4^\circ$  ( $c = 0.0015$ , MeOH). **Source:** Soft coral *Dendronephthya griffin*, mussel *Mytilus galloprovincialis*. **Pharm:** Cytotoxic (J774,  $IC_{50} = 12.1 \mu g/mL$ ; WEHI-164,  $IC_{50} = 16.3 \mu g/mL$ ; P<sub>388</sub>,  $IC_{50} = 10.4 \mu g/mL$ ) (Ciminiello, 2001); **Ref:** P. Ciminiello, et al, JOC, 2001, 66, 578 | C. Nilewski, et al, Nature (London), 2009, 457, 573



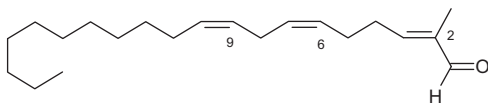
#### 42 4-Hydroxynon-2-enal

**Type:** Unbranched alkenic compounds.  $C_9H_{16}O_2$  Oil,  $bp_{0.3mmHg} 84-87^\circ C$ . **Source:** Red alga *Liagora farinosa*. **Pharm:** Ichthyotoxic. **Ref:** V. J. Paul, et al, Tet. Lett., 1980, 21, 3327



#### 43 (2E,6Z,9Z)-2-Methyl-2,6,9-eicosatrienal

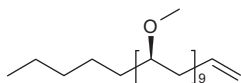
**Type:** Unbranched alkenic compounds.  $C_{21}H_{36}O$  Oil. **Source:** Calcareous sponge *Leucetta microraphis*. **Pharm:** Cytotoxic (moderate). **Ref:** K. Watanabe, et al, JNP, 2000, 63, 258



#### 44 4,6,8,10,12,14,16,18,20-Nonamethoxy-1-pentacosene

**Type:** Unbranched alkenic compounds.  $C_{34}H_{68}O_9$   $[\alpha]_D^{25} = +4.73^\circ$  ( $c = 0.43$ ,  $CHCl_3$ ).

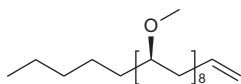
**Source:** Cyanobacteria *Tolypothrix conglutinata* var. *chlorata* (Fanning I.), *Scytonema burmanicum* and *Scytonema mirabile*. **Pharm:** Toxin. **Ref:** J. S. Mynderse, et al, *Phytochemistry*, 1979, 18, 1181 | Y. Mori, et al, *JOC*, 1991, 56, 631



#### 45 4,6,8,10,12,14,16,18-Octamethoxy-1-tricosene

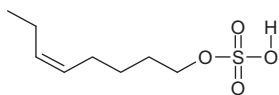
**Type:** Unbranched alkenic compounds.  $C_{31}H_{62}O_8$   $[\alpha]_D^{25} = +5.44^\circ$  ( $c = 0.5$ ,  $CHCl_3$ ).

**Source:** Cyanobacteria *Tolypothrix conglutinata* var. *chlorata* (Fanning I., Kiribati, Oceania), *Scytonema burmanicum* and *Scytonema mirabile*. **Pharm:** Toxin. **Ref:** J. S. Mynderse, et al, *Phytochemistry*, 1979, 18, 1181 | Y. Mori, et al, *JOC*, 1991, 56, 631



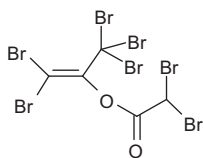
#### 46 (E)-5-Octenyl sulfate

**Type:** Unbranched alkenic compounds.  $C_8H_{16}O_4S$  Colorless amorph. solid. **Source:** Ascidian *Halocynthia papillosa* (Mediterranean Sea). **Pharm:** Cytotoxic (WEHI-164,  $IC_{50} = (12.2 \pm 0.9)\mu g/mL$ ; C6,  $IC_{50} = (515.2 \pm 5.2)\mu g/mL$ ). **Ref:** A. Aiello, et al, *JNP*, 2000, 63, 1590



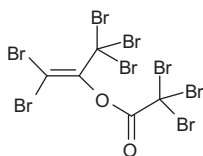
#### 47 Pentabromopropen-2-yl dibromoacetate

Enol dibromoacetate **Type:** Unbranched alkenic compounds.  $C_5HBr_7O_2$  Oil. **Source:** Red alga *Asparagopsis taxiformis*. **Pharm:** Aldose reductase inhibitor. **Ref:** M. Sugano, et al, *Tet. Lett.*, 1990, 31, 7015



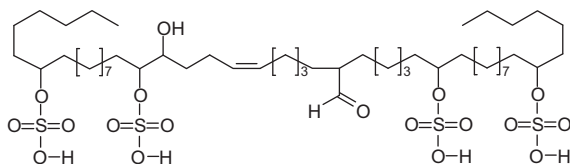
#### 48 Pentabromopropen-2-yl tribromoacetate

**Type:** Unbranched alkenic compounds.  $C_5Br_8O_2$  mp 120–121 °C. **Source:** Red alga *Asparagopsis taxiformis*. **Pharm:** Aldose reductase inhibitor. **Ref:** M. Sugano, et al, Tet. Lett., 1990, 31, 7015



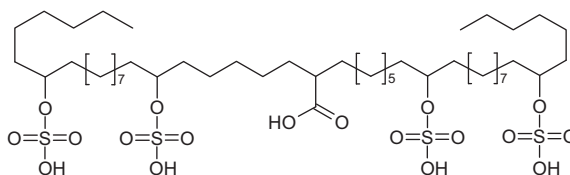
#### 49 Toxadocial C

**Type:** Unbranched alkenic compounds.  $C_{50}H_{98}O_{18}S_4$  Amorph. solid (tetra-Na salt),  $[\alpha]_D^{23} = +2.2^\circ$  ( $c = 0.2$ , MeOH) (tetra-Na salt). **Source:** Sponge *Toxadocia cylindrica*. **Pharm:** Thrombin inhibitor. **Ref:** Y. Nakao, et al, Tetrahedron, 1993, 48, 11183



#### 50 Toxadocic acid

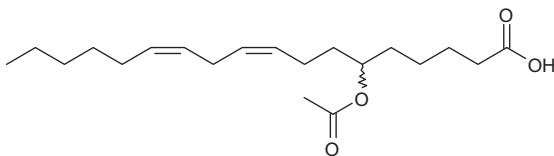
**Type:** Unbranched alkenic compounds.  $C_{48}H_{96}O_{18}S_4$  Amorph. solid,  $[\alpha]_D^{23} = +0.6^\circ$  ( $c = 0.36$ , MeOH). **Source:** Sponge *Toxadocia cylindrica*. **Pharm:** Thrombin inhibitor. **Ref:** Y. Nakao, et al, Tetrahedron, 1993, 48, 11183



#### 51 6-Acetoxylinoleic acid

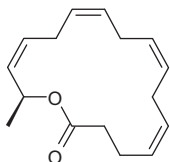
**Type:** Unbranched alkenic acid and lactones.  $C_{20}H_{34}O_4$   $[\alpha]_D^{23} = -1.04^\circ$  ( $c = 0.5$ ,  $CHCl_3$ ). **Source:** Brown alga *Spatoglossum pacificum*. **Pharm:** Pollen growth inhibitor. **Ref:** H. Tazaki, et al, Agric. Biol. Chem., 1991, 55, 2149





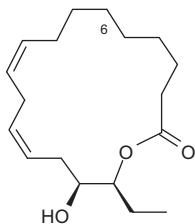
### 52 Aplyolide A

4,7,10,13-Hexadecatetraen-15-olide Type: Unbranched alkenic acid and lactones.  $C_{16}H_{22}O_2$  Oil,  $[\alpha]_D^{25} = -57.9^\circ$  ( $c = 0.4$ ,  $CHCl_3$ ). Source: Sea hare *Aplysia depilans* (Atlantic Coast of Spain, Bay of Naples). Pharm: Ichthyotoxic. Ref: A. Spinella, et al, JOC, 1997, 62, 5471 | T. V. Hansen, et al, Tetrahedron: Asymmetry, 2001, 12, 1407



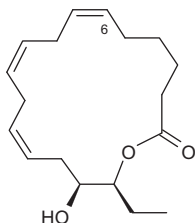
### 53 Aplyolide B

15-Hydroxy-9,12-octadecadien-16-olide Type: Unbranched alkenic acid and lactones.  $C_{18}H_{30}O_3$  Oil,  $[\alpha]_D^{25} = -42.8^\circ$  ( $c = 0.2$ ,  $CHCl_3$ ). Source: Sea hare *Aplysia depilans* (Atlantic Coast of Spain, Bay of Naples). Pharm: Ichthyotoxin. Ref: A. Spinella, et al, JOC, 1997, 62, 5471



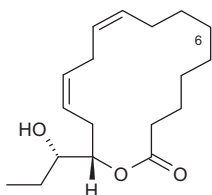
### 54 Aplyolide C

15-Hydroxy-6,9,12-octadecatrien-16-olide Type: Unbranched alkenic acid and lactones.  $C_{18}H_{28}O_3$  Oil,  $[\alpha]_D^{25} = -26.7^\circ$  ( $c = 0.7$ ,  $CHCl_3$ ). Source: Sea hare *Aplysia depilans* (Atlantic Coast of Spain, Bay of Naples). Pharm: Ichthyotoxin. Ref: A. Spinella, et al, JOC, 1997, 62, 5471



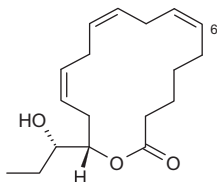
### 55 Aplyolide D

16-Hydroxy-9,12-octadecadien-15-olide Type: Unbranched alkenic acid and lactones.  $C_{18}H_{30}O_3$  Oil,  $[\alpha]_D^{25} = +28^\circ$  ( $c = 0.1$ ,  $CHCl_3$ ). Source: Sea hare *Aplysia depilans* (Atlantic Coast of Spain, Bay of Naples). Pharm: Ichthyotoxic. Ref: A. Spinella, et al, JOC, 1997, 62, 5471



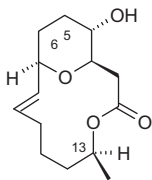
### 56 Aplyolide E

16-Hydroxy-6,9,12-octadecatrien-15-olide Type: Unbranched alkenic acid and lactones.  $C_{18}H_{28}O_3$  Oil,  $[\alpha]_D^{25} = +46.3^\circ$  ( $c = 0.3$ ,  $CHCl_3$ ). Source: Sea hare *Aplysia depilans* (Atlantic Coast of Spain, Bay of Naples). Pharm: Ichthyotoxic. Ref: A. Spinella, et al, JOC, 1997, 62, 5471



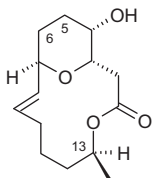
### 57 Aspergillide A

Type: Unbranched alkenic acid and lactones.  $C_{14}H_{22}O_4$  Oil,  $[\alpha]_D^{27} = -59.5^\circ$  ( $c = 0.45$ ,  $CHCl_3$ ). Source: Marine-derived fungus *Aspergillus ostianus* 01F313. Pharm: Cytotoxic ( $L_{1210}$ ,  $IC_{50} = 2.1 \mu\text{g/mL}$ ). Ref: K. Kito, et al, Org. Lett., 2008, 10, 225 | S. M. Hande, et al, Tet. Lett., 2009, 50, 189 | R. Ookura, et al, Chem. Lett., 2009, 38, 384



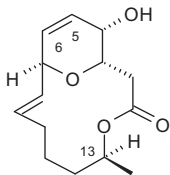
### 58 Aspergillide B

**Type:** Unbranched alkenic acid and lactones.  $C_{14}H_{22}O_4$  Cryst.,  $[\alpha]_D^{31} = -97.2^\circ$  ( $c = 0.27$ , MeOH). **Source:** Marine-derived fungus *Aspergillus ostianus* 01F313. **Pharm:** Cytotoxic ( $L_{1210}$ ,  $IC_{50} = 71.0 \mu\text{g/mL}$ ). **Ref:** K. Kito, et al, Org. Lett., 2008, 10, 225 | S. M. Hande, et al, Tet. Lett., 2009, 50, 189 | R. Ookura, et al, Chem. Lett., 2009, 38, 384



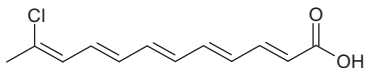
### 59 Aspergillide C

**Type:** Unbranched alkenic acid and lactones.  $C_{14}H_{20}O_4$  Oil,  $[\alpha]_D^{25} = +66.2^\circ$  ( $c = 0.19$ , MeOH). **Source:** Marine-derived fungus *Aspergillus ostianus* 01F313. **Pharm:** Cytotoxic ( $L_{1210}$ ,  $IC_{50} = 2.0 \mu\text{g/mL}$ ). **Ref:** K. Kito, et al, Org. Lett., 2008, 10, 225 | T. Nagasawa, et al, Org. Lett., 2009, 11, 761



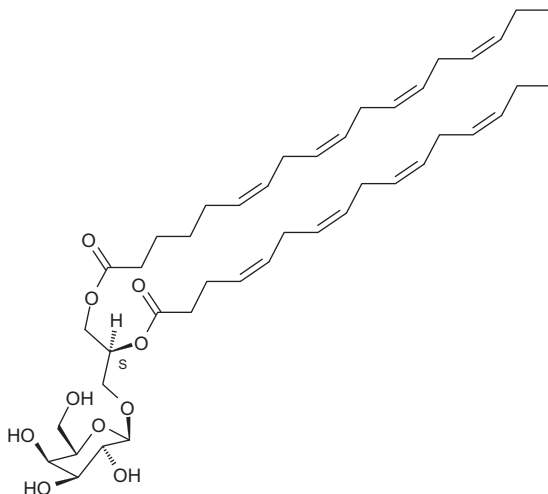
### 60 Aurantioic acid

**Type:** Unbranched alkenic acid and lactones.  $C_{12}H_{13}ClO_2$  Amorph. yellow solid. **Source:** Lithistid sponge *Theonella swinhoei* (depth of 20–50 m, Bunaken Marine Park, North Sulawesi, Indonesia). **Pharm:** Cytotoxic (C6, HeLa, and H9c2,  $MIC = 70 \mu\text{mol/L}$ ). **Ref:** R. F. Angawi, et al, JNP, 2009, 72, 2195 | P. L. Winder, et al, Mar. Drugs, 2011, 9, 2644 (rev)

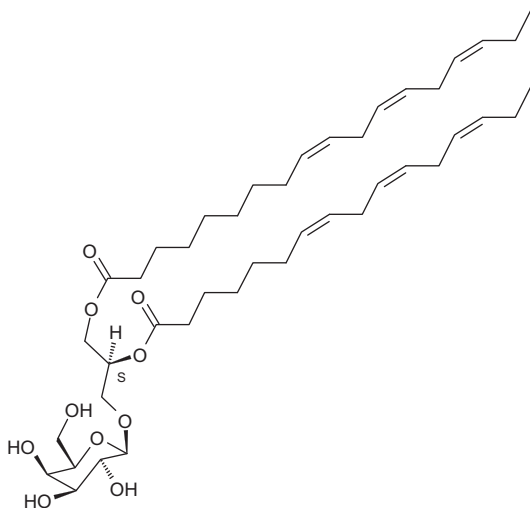


**61 Capsofulvesin A**

**Type:** Unbranched alkenic acid and lactones.  $C_{43}H_{66}O_{10}$  **Source:** Green alga *Capsosiphon fulvescens* (edible). **Pharm:** Hypoglycemic (aldose reductase inhibitor) (rat lens aldose reductase RLAR inhibitor *in vitro* assays,  $IC_{50} = 52.53 \mu\text{mol/L}$ , control Quercetin,  $IC_{50} = 6.80 \mu\text{mol/L}$ ). **Ref:** M. N. Islam, et al, Eur. J. Nutr., 2014, 53, 233

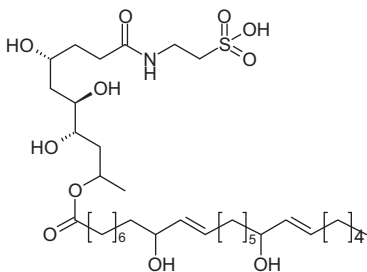
**62 Capsofulvesin B**

**Type:** Unbranched alkenic acid and lactones.  $C_{43}H_{70}O_{10}$  **Source:** Green alga *Capsosiphon fulvescens* (edible). **Pharm:** Hypoglycemic (aldose reductase inhibitor) (rat lens aldose reductase RLAR inhibitor *in vitro* assays,  $IC_{50} = 101.92 \mu\text{mol/L}$ , control Quercetin,  $IC_{50} = 6.80 \mu\text{mol/L}$ ). **Ref:** M. N. Islam, et al, Eur. J. Nutr., 2014, 53, 233

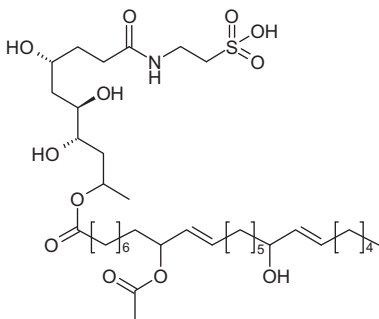


**63 Carteriosulfonic acid A**

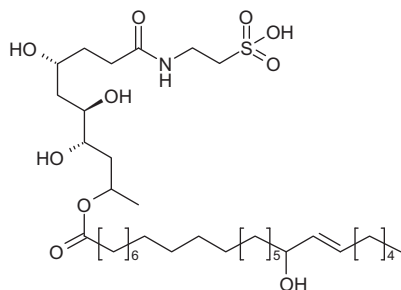
**Type:** Unbranched alkenic acid and lactones.  $C_{36}H_{67}NO_{11}S$  Amorph. solid,  $[\alpha]_D^{25} = -20^\circ$  ( $c = 0.07$ , MeOH). **Source:** Sponge *Carteriospongia* sp. (San Miguel I., Philippines). **Pharm:** Kinase GSK-3 $\beta$  inhibitor ( $^{32}P$  labeling assay,  $IC_{50} = 12.5 \mu\text{mol/L}$ ). **Ref:** M. W. B. McCulloch, et al, JNP, 2009, 72, 1651 | D. Skropeta, et al, Mar. Drugs, 2011, 9, 2131 (rev)

**64 Carteriosulfonic acid B**

**Type:** Unbranched alkenic acid and lactones.  $C_{38}H_{69}NO_{12}S$  Amorph. solid,  $[\alpha]_D^{25} = -13^\circ$  ( $c = 0.1$ , MeOH). **Source:** Sponge *Carteriospongia* sp. (San Miguel I., Philippines). **Pharm:** Kinase GSK-3 $\beta$  inhibitor ( $^{32}P$  labeling assay,  $IC_{50} = 6.8 \mu\text{mol/L}$ ). **Ref:** M. W. B. McCulloch, et al, JNP, 2009, 72, 1651 | D. Skropeta, et al, Mar. Drugs, 2011, 9, 2131 (rev)

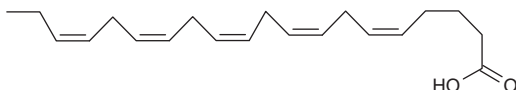
**65 Carteriosulfonic acid C**

**Type:** Unbranched alkenic acid and lactones.  $C_{34}H_{65}NO_{10}S$  Amorph. solid,  $[\alpha]_D^{25} = -43^\circ$  ( $c = 0.12$ , MeOH). **Source:** Sponge *Carteriospongia* sp. (San Miguel I., Philippines). **Pharm:** Kinase GSK-3 $\beta$  inhibitor ( $^{32}P$  labeling assay,  $IC_{50} = 6.8 \mu\text{mol/L}$ ). **Ref:** M. W. B. McCulloch, et al, JNP, 2009, 72, 1651 | D. Skropeta, et al, Mar. Drugs, 2011, 9, 2131 (rev)



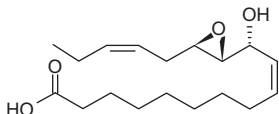
### 66 (5,8,11,14,17)-Eicosapentaenoic acid

EPA; Timnodonic acid; Icosapent Type: Unbranched alkenic acid and lactones.  $C_{20}H_{30}O_2$  Oil. Source: Red alga *Neodilsea yendoana*. Pharm: Antioxidant (nutriceutical); platelet aggregation inhibitor; allelopathic. Ref: M. Suzuki, et al, *Phytochemistry*, 1996, 43, 63



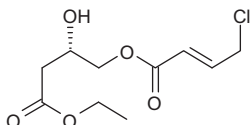
### 67 (9Z,11R,12S,13S,15Z)-12,13-Epoxy-11-hydroxyoctadeca-9,15-dienoic acid

Type: Unbranched alkenic acid and lactones.  $C_{18}H_{30}O_4$  Oil,  $[\alpha]_D^{27} = +40.3^\circ$  ( $c = 1.2$ ,  $CHCl_3$ ). Source: Green alga *Acrosiphonia coalita*. Pharm: Phytoalexin. Ref: M. W. Bernart, et al, *JNP*, 1993, 56, 238



### 68 Honaucin B

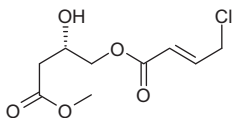
Type: Unbranched alkenic acid and lactones.  $C_{10}H_{15}ClO_5$  Source: Cyanobacterium *Leptolyngbya crossbyana* (Hōnaunau reef, Hawaii). Pharm: Inhibits NO production and expression of several pro-inflammatory cytokines (RAW264.7 cells); inhibits bioluminescence (*Vibrio harveyi*). Ref: H. Choi, et al, *Chem. Biol.*, 2012, 19,589



### 69 Honaucin C

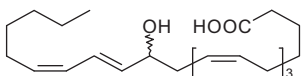
Type: Unbranched alkenic acid and lactones.  $C_9H_{13}ClO_5$  Source: Cyanobacterium *Leptolyngbya crossbyana* (Hōnaunau reef, Hawaii). Pharm: Inhibits NO production

and expression of several pro-inflammatory cytokines (RAW264.7 cells); inhibits bioluminescence (*Vibrio harveyi*). Ref: H. Choi, et al, Chem. Biol., 2012, 19,589



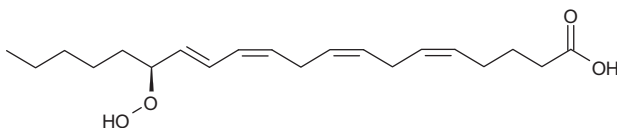
### 70 15-HTPE

(6Z,9Z,12Z,15ξ,16E,18Z)-15-Hydroxy-6,9,12,16,18-tetracosapentaenoic acid Type: Unbranched alkenic acid and lactones. C<sub>24</sub>H<sub>38</sub>O<sub>3</sub> Amorph. solid. Source: Soft coral *Sinularia numerosa* (Kagoshima Prefecture, Japan). Pharm: Antiangiogenic (inhibited tube-formation in hmn endothelial cell line model). Ref: T. Yamashita, et al, BoMC, 2009, 17, 2181



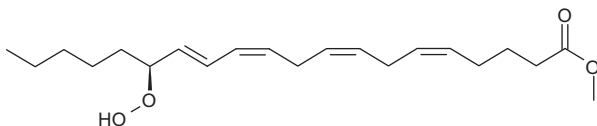
### 71 (5Z,8Z,11Z,13E,15S)-15-Hydroperoxy-5,8,11,13-eicosatetraenoic acid

15-HPETE Type: Unbranched alkenic acid and lactones. C<sub>20</sub>H<sub>32</sub>O<sub>4</sub> [α]<sub>D</sub> = -4.6° (MeOH). Source: Brown alga *Laminaria angustata*. Pharm: Prostacyclin synthase inhibitor. Ref: K. Boonprab, et al, Phytochemistry, 2003, 63, 669



### 72 (5Z,8Z,11Z,13E,15S)-15-Hydroperoxy-5,8,11,13-eicosatetraenoic acid methyl ester

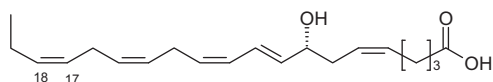
Type: Unbranched alkenic acid and lactones. C<sub>21</sub>H<sub>34</sub>O<sub>4</sub> [α]<sub>D</sub> = -3.5° (MeOH). Source: Brown alga *Laminaria angustata*. Pharm: Prostacyclin synthase inhibitor. Ref: K. Boonprab, et al, Phytochemistry, 2003, 63, 669



### 73 (5Z,8R,9E,11Z,14Z,17Z)-8-Hydroxycicosa-5,9,11,14,17-pentaenoic acid

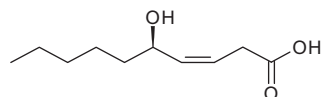
8-HEPE Type: Unbranched alkenic acid and lactones. C<sub>20</sub>H<sub>30</sub>O<sub>3</sub> Oil, [α]<sub>D</sub><sup>24</sup> = +33.4° (c = 2, CHCl<sub>3</sub>) (86%ee). Source: Starfish *Patiria miniata*, black coral *Leiopathes* sp.,

barnacle *Balanus balanoides*. **Pharm:** Hatching factor (barnacles *Balanus balanoides* and *Eliminus modestus*). **Ref:** M. V. D'Auria, et al, *Experientia*, 1988, 44, 719 | A. Guerriero, et al, *Helv. Chim. Acta*, 1988, 71, 1094 | T. K. M. Shing, et al, *Tet. Lett.*, 1994, 35, 1067



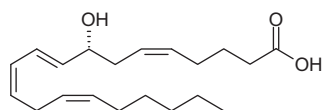
#### 74 (3Z,5R)-5-Hydroxy-3-decenoic acid

**Type:** Unbranched alkenic acid and lactones.  $C_{10}H_{18}O_3$  Oil. **Source:** Marine-derived fungus *Aureobasidium* sp. from marine aquatic plant *Posidonia oceanica*. **Pharm:** Antifungal (*Candida albicans*); antibacterial (*Staphylococcus aureus*, *Escherichia coli* and *Bacillus subtilis*). **Ref:** A. Abdel-Lateff, et al, *Nat. Prod. Commun.*, 2009, 4, 389



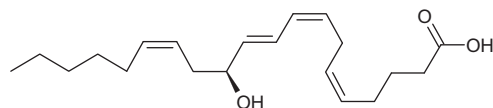
#### 75 (5Z,8R,9E,11Z,14Z)-8-Hydroxy-5,9,11,14-eicosatetraenoic acid

8-HETE **Type:** Unbranched alkenic acid and lactones.  $C_{20}H_{32}O_3$  [ $\alpha_D^{20} = +4^\circ$  ( $c = 0.48$ ,  $CHCl_3$ )]. **Source:** Starfish *Patiria miniata*, black coral *Leiopathes* sp., horseshoe crab *Limulus polyphemus*. **Pharm:** Modulator of immune response in *Limulus polyphemus*. **Ref:** M. V. D'Auria, et al, *Experientia*, 1988, 44, 719 | A. Guerriero, et al, *Helv. Chim. Acta*, 1988, 71, 1094 | J. C. MacPherson, et al, *Biochim. Biophys. Acta*, 1996, 1303, 127



#### 76 (12S)-12-Hydroxyeicosatetraenoic acid

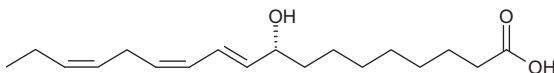
**Type:** Unbranched alkenic acid and lactones.  $C_{20}H_{32}O_3$  **Source:** Red alga *Murrayella pericladus* (Caribbean Sea). **Pharm:** Immunohormone; cell growth inhibitor; proinflammatory agent; toxic (brine shrimp). **Ref:** M. W. Bernart, et al, *Phytochemistry*, 1994, 36, 1233



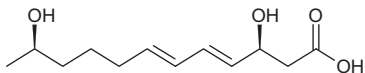


**77 (9R,10E,12Z,15Z)-9-Hydroxy-10,12,15-octadecatrienoic acid**

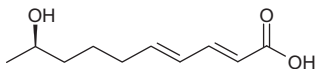
**Type:** Unbranched alkenic acid and lactones.  $C_{18}H_{30}O_3$  **Source:** Cyanobacterium *Anabaena flos-aquae* NIES 74. **Pharm:** Anti-inflammatory. **Ref:** N. Murakami, et al, *Lipids*, 1992, 27, 776

**78 leodomycin C**

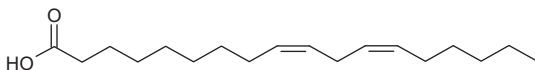
**Type:** Unbranched alkenic acid and lactones.  $C_{12}H_{20}O_4$  Pale amorph. solid,  $[\alpha]_D^{23} = +18^\circ$  ( $c = 0.1$ ,  $CHCl_3$ ). **Source:** Marine-derived bacterium *Bacillus* sp. (sediment, Ieodo, South Korea). **Pharm:** Antibacterial (*Bacillus subtilis* and *Escherichia coli*, MIC = 32–64  $\mu\text{g/mL}$ ); antifungal (yeast *Saccharomyces cerevisiae*, MIC = 256  $\mu\text{g/mL}$ ). **Ref:** M. A. M. Mondol, et al, *JNP*, 2011, 74, 1606

**79 leodomycin D**

**Type:** Unbranched alkenic acid and lactones.  $C_{10}H_{16}O_3$  light yellowish amorph. solid,  $[\alpha]_D^{23} = +15^\circ$  ( $c = 0.8$ ,  $CHCl_3$ ). **Source:** Marine-derived bacterium *Bacillus* sp. (sediment, Ieodo, South Korea). **Pharm:** Antibacterial (*Bacillus subtilis* and *Escherichia coli*, MIC = 32–64  $\mu\text{g/mL}$ ); antifungal (yeast *Saccharomyces cerevisiae*, MIC = 256  $\mu\text{g/mL}$ ). **Ref:** M. A. M. Mondol, et al, *JNP*, 2011, 74, 1606

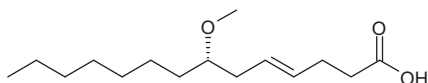
**80 Linoleate**

**Type:** Unbranched alkenic acid and lactones.  $C_{18}H_{32}O_2$  **Source:** Deep-sea fungus *Paecilomyces lilacinus* ZBY-1. **Pharm:** Cytotoxic (100  $\mu\text{g/mL}$ : K562, MCF7, HL60, and BGC823, InRt = 30%–80%). **Ref:** X. Cui, et al, *J. Int. Pharm. Res.*, 2013, 40, 765 (in Chinese)

**81 Lyngbic acid**

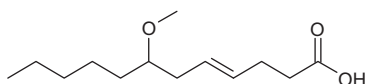
(4E)-7-Methoxytetradec-4-enoic acid **Type:** Unbranched alkenic acid and lactones.  $C_{15}H_{28}O_3$  Oil,  $bp_{0.005\text{mmHg}} 120\text{--}130^\circ\text{C}$ ,  $[\alpha]_D^{23} = -14.1^\circ$  ( $c = 0.34$ ,  $CHCl_3$ ),  $[\alpha]_D^{20} = -11.3^\circ$  ( $c = 5$ ,  $CHCl_3$ ),  $[\alpha]_D^{25} = -4.8^\circ$  ( $c = 0.22$ ,  $CH_2Cl_2$ ). **Source:**

Cyanobacterium *Lyngbya majuscula* (Bush Key, Dry Tortugas, Florida). Pharm: Antibacterial (gram-positive bacteria *Staphylococcus aureus*, *Bacillus subtilis*); toxic (brine shrimp). Ref: J. H. Cardellina, et al, *Phytochemistry*, 1978, 17, 2091 | W. H. Gerwick, et al, *Phytochemistry*, 1987, 26, 1701 | D. Enders, et al, *Tetrahedron*, 1996, 52, 5805 | Y. Kan, et al, *JNP*, 2000, 63, 1599 | H. Gross, et al, *Phytochemistry* 2010, 71, 1729 | J. C. Kwan, et al, *JNP*, 2010, 73, 463



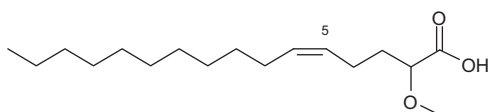
### 82 (-)-7-Methoxydodec-4(E)-enoic acid

Type: Unbranched alkenic acid and lactones.  $C_{13}H_{24}O_3$  Pale yellow oil,  $[\alpha]_D^{20} = -8^\circ$  ( $c = 1.8$ ,  $CHCl_3$ ). Source: Cyanobacterium *Lyngbya majuscula* (Mediterranean Sea, France). Pharm: Immunosuppressive (on culture cells with concanavaline k and LPS,  $ED_{50} = 6 \mu\text{g/mL}$ ). Ref: C. Le, et al, *Chin. J. Mar. Drugs*. 1999, 18(2), 12 | V. Mesguiche, et al, *Tet. Lett.*, 1999, 40, 7473



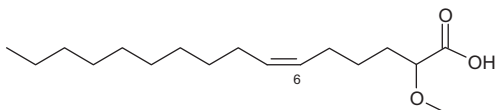
### 83 (Z)-2-Methoxyhexadec-5-enoic acid

Type: Unbranched alkenic acid and lactones.  $C_{17}H_{32}O_3$  Source: Sponge *Mycale laxissima* (Caribbean Sea). Pharm: Antibacterial (gram-positive bacteria, *Staphylococcus aureus*,  $MIC = 0.35 \mu\text{mol/mL}$ , *Streptococcus faecalis*,  $MIC = 0.35 \mu\text{mol/mL}$ ). Ref: N. M. Carballiera et al, *Lipids*, 1992, 27, 72 | N. M. Carballiera, et al, *JNP*, 1998, 61, 1543



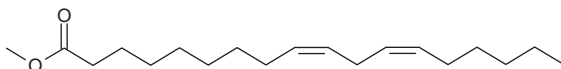
### 84 (Z)-2-Methoxyhexadec-6-enoic acid

Type: Unbranched alkenic acid and lactones.  $C_{17}H_{32}O_3$  Source: Sponge *Sphaciospongia cuspidifera* (Caribbean Sea). Pharm: Antibacterial (gram-positive bacteria, *Staphylococcus aureus*,  $MIC = 0.35 \mu\text{mol/mL}$ , *Streptococcus faecalis*,  $MIC = 0.35 \mu\text{mol/mL}$ ). Ref: N. M. Carballiera et al, *Lipids*, 1992, 27, 72 | N. M. Carballiera, et al, *JNP*, 1998, 61, 1543



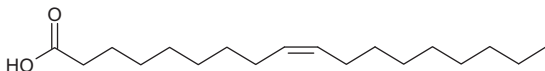
### 85 Methyl linoleate

**Type:** Unbranched alkenic acid and lactones.  $C_{19}H_{34}O_2$  **Source:** Deep-sea fungus *Paecilomyces lilacinus* ZBY-1. **Pharm:** Cytotoxic (100  $\mu\text{g/mL}$ : K562, MCF7, HL60, and BGC823, InRt = 30%–80%). **Ref:** X. Cui, et al, J. Int. Pharm. Res., 2013, 40, 765 (in Chinese)



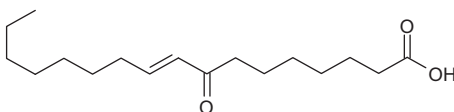
### 86 Oleic acid

**Type:** Unbranched alkenic acid and lactones.  $C_{18}H_{34}O_2$  **Source:** Deep-sea fungus *Paecilomyces lilacinus* ZBY-1. **Pharm:** Cytotoxic (100  $\mu\text{g/mL}$ : K562, MCF7, HL60, and BGC823, InRt = 30%–80%). **Ref:** X. Cui, et al, J. Int. Pharm. Res., 2013, 40, 765 (in Chinese)



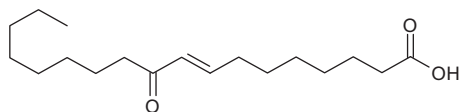
### 87 9-Oxo-10-octadecenoic acid

**Type:** Unbranched alkenic acid and lactones.  $C_{17}H_{30}O_3$  Oil. **Source:** Red alga *Gracilaria verrucosa*. **Pharm:** Anti-inflammatory (modulation of LPS-activated murine macrophages *in vitro*,  $IC_{50}$  (apparent) < 20  $\mu\text{g/mL}$ , MMOA: NO, IL-6 and TNF- $\alpha$  inhibition). **Ref:** H. T. Dang, et al, JNP, 2008, 71, 232



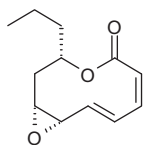
### 88 10-Oxo-8-octadecenoic acid

**Type:** Unbranched alkenic acid and lactones.  $C_{18}H_{32}O_3$  Oil. **Source:** Red alga *Gracilaria verrucosa*. **Pharm:** Anti-inflammatory (modulation of LPS-activated murine macrophages *in vitro*,  $IC_{50}$  (apparent) < 20  $\mu\text{g/mL}$ , MMOA: NO, IL-6 and TNF- $\alpha$  inhibition). **Ref:** H. T. Dang, et al, JNP, 2008, 71, 232



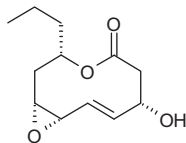
### 89 Phomolide A

**Type:** Unbranched alkenic acid and lactones.  $C_{12}H_{16}O_3$  **Source:** Marine fungus *Phomopsis* sp. hzla01-1. **Pharm:** Antibacterial (*Escherichia coli*, *Candida albicans*, *Saccharomyces cerevisiae*). **Ref:** X. P. Du, et al, J. Antibiot., 2008, 61, 250



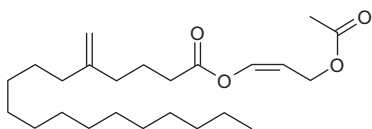
### 90 Phomolide B

**Type:** Unbranched alkenic acid and lactones.  $C_{12}H_{18}O_4$  **Source:** Marine fungus *Phomopsis* sp. hzla01-1. **Pharm:** Antibacterial (*Escherichia coli*, *Candida albicans*, *Saccharomyces cerevisiae*). **Ref:** X. P. Du, et al, J. Antibiot., 2008, 61, 250



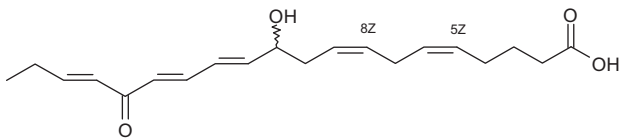
### 91 Propenediester

**Type:** Unbranched alkenic acid and lactones.  $C_{24}H_{42}O_4$  **Source:** Cyanobacteria *Lyngbya majuscula* (New Ireland, Papua New Guinea) and *Oscillatoria* sp. (Isla Canales de Afuera, Coiba National Park, Panama). **Pharm:** Agonist of CB1 cannabinoid receptor ( $IC_{50} > 10 \mu\text{mol/L}$ ). **Ref:** M. Gutiérrez, et al, JNP, 2011, 74, 2313



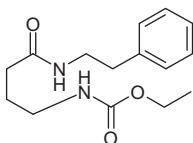
### 92 Ptilodene

**Type:** Unbranched alkenic acid and lactones.  $C_{20}H_{28}O_4$  **Source:** Red alga *Ptilota filicina*. **Pharm:** Antibacterial (inhibits growth of several pathogenic gram-positive and -negative bacteria); 5-lipoxygenase inhibitor (hmn); Na/K-ATPase inhibitor (dog kidney). **Ref:** W. H. Gerwick, et al, Tet. Lett., 1988, 1505



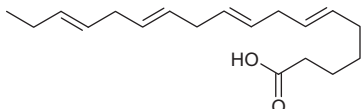
### 93 Santacruzamate A

**Type:** Unbranched alkenic acid and lactones.  $C_{15}H_{22}N_2O_3$  **Source:** Cyanobacterium *Symploca*-like sp. (Santa Cruz I., Coiba National Park, Panama). **Pharm:** Histone deacetylase 4 inhibitor (potent and specific); cytotoxic (several HTCLs). **Ref:** C. M. Pavlik, et al, JNP, 2013, 76, 2026



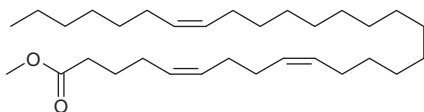
### 94 Stearidonic acid

**Type:** Unbranched alkenic acid and lactones.  $C_{18}H_{28}O_2$  Pale yellow oil, mp  $-57\text{ }^\circ\text{C}$ . **Source:** Brown alga *Undaria pinnatifida*, green alga *Ulva fasciata*, herring and other fish oils. **Pharm:** Anti-inflammatory (inhibition of mouse ear inflammation,  $IC_{50} = 160\text{--}314\text{ }\mu\text{g/ear}$ , MMOA: inhibition of edema, erythema and blood flow). **Ref:** M. A. Alamsjah, et al, Biosci., Biotechnol., Biochem., 2005, 69, 2186 | M. N. Khan, et al, J. Agric. Food Chem. 2007, 55, 6984



### 95 (all-Z)-5,9,13,17-Tetraoctadecatrienoic acid methyl ester

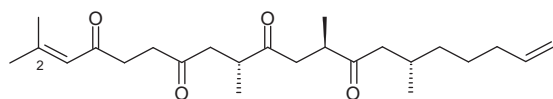
**Type:** Unbranched alkenic acid and lactones.  $C_{31}H_{56}O_2$  Oil. **Source:** Lithistid sponge *Chondrilla nucula*. **Pharm:** Elastase inhibitor. **Ref:** M. Meyer, et al, Lipids, 2002, 37, 1109



### 96 Amphidinoketide I

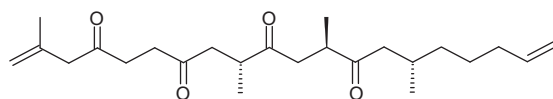
2,9,12,15-Tetramethyl-2,19-eicosadiene-4,7,10,13-tetrone **Type:** Branched alkenic compounds  $C_{24}H_{38}O_4$  Oil,  $[\alpha]_D^{25} = +25.3^\circ$  ( $\text{CH}_2\text{Cl}_2$ ). **Source:** Dinoflagellate *Amphidinium* sp. S1-36-5 (St. Thomas, US Virgin Is.). **Pharm:** Cytotoxic (HCT116,

$IC_{50}$  = 4.98  $\mu\text{g/mL}$ ); cytotoxic (antileukemia). Ref: I. Bauer, et al, Tet. Lett., 1995, 36, 991 | L. M. Walsh, et al, Chem. Comm., 2003, 2616



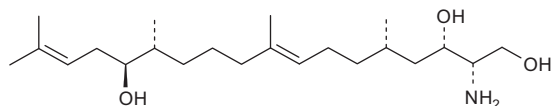
### 97 Amphidinoketide II

Type: Branched alkenic compounds  $C_{24}H_{38}O_4$  Oil,  $[\alpha]_D^{25} = +33.9^\circ$  ( $\text{CH}_2\text{Cl}_2$ ). Source: Dinoflagellate *Amphidinium* sp. S1-36-5 (St. Thomas, US Virgin Is.). Pharm: Cytotoxic (HCT116,  $IC_{50} = 73 \mu\text{g/mL}$ ); cytotoxic (antileukemia). Ref: I. Bauer, et al, Tet. Lett., 1995, 36, 991 | L. M. Walsh, et al, Chem. Comm., 2003, 2616



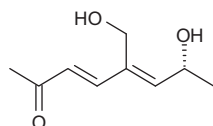
### 98 Apldiasphingosine

Type: Branched alkenic compounds  $C_{22}H_{43}NO_3$  Oil. Source: Ascidians *Aplidium* spp. Pharm: Antimicrobial; antiviral; cytotoxic. Ref: G. T. Carter, et al, JACS, 1978, 100, 7441 | K. Mori, et al, Tet. Lett., 1981, 22, 4429; 4433



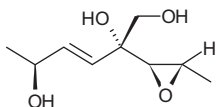
### 99 epi-Aspinonediol

Type: Branched alkenic compounds  $C_9H_{14}O_3$  Colorless oil (MeOH),  $[\alpha]_D^{25} = -5.4^\circ$  ( $c = 0.14$ , MeOH). Source: Deep-sea fungus *Aspergillus* sp. 16-02-1 from sediment (Lau Basin hydrothermal vent, depth of 2255 m, temperature 114  $^\circ\text{C}$ ). Pharm: Cytotoxic (MTT method, HL60,  $IC_{50} = 32.8 \mu\text{g/mL}$  (192.9  $\mu\text{mol/L}$ ); K562,  $IC_{50} = 44.3 \mu\text{g/mL}$  (260.6  $\mu\text{mol/L}$ ); 100  $\mu\text{g/mL}$ : HL60, InRt = 72.5%, control Docetaxol, InRt = 49.9%; HeLa, InRt = 14.9%, Docetaxol, InRt = 45.1%; K562, InRt = 79.7%, Docetaxol, InRt = 55.6%; BGC823, InRt = 21.8%, Docetaxol, InRt = 61.5%). Ref: X. Chen, et al, Mar. Drugs, 2014, 12, 3116

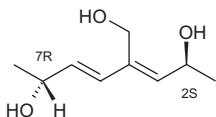


**100 Aspinonene**

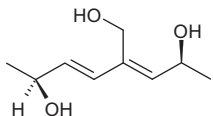
6,7-Epoxy-5-(hydroxymethyl)-3-octene-2,5-diol Type: Branched alkenic compounds  $C_9H_{16}O_4$  Oil. Source: Marine-derived fungus *Aspergillus ostianus* 01F313 from unidentified sponge (Pohnpei I., Federated States of Micronesia), terrestrial fungus (*Aspergillus ochraceus* DSM 7428). Pharm: Cytotoxic ( $L_{1210}$ , 25 ppm, InRt = 27%). Ref: J. Fuchser, et al, Annalen, 1994, 831 | K. Kito, et al, JNP, 2007, 70, 2022

**101 Aspinotriol A**

(2S,3Z,5E,7R)-4-(Hydroxymethyl)-3,5-octadiene-2,7-diol Type: Branched alkenic compounds  $C_9H_{16}O_3$  Oil,  $[\alpha]_D^{25} = -10.1^\circ$  ( $c = 0.23$ , MeOH). Source: Marine-derived fungus *Aspergillus ostianus* 01F313 from unidentified sponge (Pohnpei I., Federated States of Micronesia), deep-sea fungus *Aspergillus* sp. 16-02-1 from sediment (Lau Basin hydrothermal vent, depth of 2255 m, temperature 114 °C). Pharm: Cytotoxic (MTT method, 100  $\mu\text{g/mL}$ : HeLa, InRt = 14.1%, control Docetaxol, InRt = 45.1%; K562, InRt = 17.0%, Docetaxol, InRt = 55.6%). Ref: K. Kito, et al, JNP, 2007, 70, 2022 | X. Chen, et al, Mar. Drugs, 2014, 12, 3116

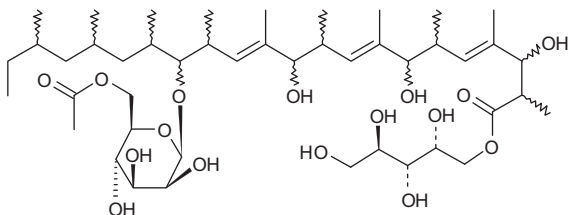
**102 Aspinotriol B**

Type: Branched alkenic compounds  $C_9H_{16}O_3$  Oil,  $[\alpha]_D^{25} = +6.1^\circ$  ( $c = 0.21$ , MeOH). Source: Marine-derived fungus *Aspergillus ostianus* 01F313 from unidentified sponge (Pohnpei I., Federated States of Micronesia), deep-sea fungus *Aspergillus* sp. 16-02-1 from sediment (Lau Basin hydrothermal vent, depth of 2255 m, temperature 114 °C). Pharm: Cytotoxic (MTT method, 100  $\mu\text{g/mL}$ : HL60, InRt = 39.4%, HeLa, InRt = 12.3%, K562, InRt = 20.3%, Docetaxol, InRt = 55.6%; BGC823, InRt = 15.7%). Ref: K. Kito, et al, JNP, 2007, 70, 2022 | X. Chen, et al, Mar. Drugs, 2014, 12, 3116

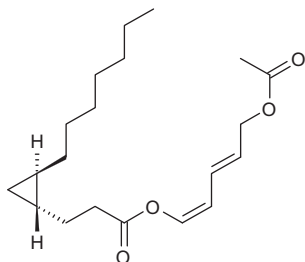


**103 Cladionol A**

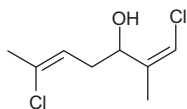
**Type:** Branched alkenic compounds  $C_{45}H_{80}O_{16}$  Amorph. solid,  $[\alpha]_D^{22} = +36^\circ$  ( $c = 0.2$ , MeOH). **Source:** Marine-derived fungus *Gliocladium* sp. L049 (cultured broth) from sea grass *Syringodium isoetifolium* (Maeda Cape, Okinawa Island). **Pharm:** Cytotoxic ( $L_{1210}$ ,  $IC_{50} = 5 \mu\text{g/mL}$ ; KB,  $IC_{50} = 7 \mu\text{g/mL}$ ). **Ref:** Y. Kasai, et al, JNP, 2005, 68, 777 | M. Saleem, et al, NPR, 2007, 24, 1142 (rev)

**104 Debromogrenadiene**

**Type:** Branched alkenic compounds  $C_{20}H_{32}O_4$   $[\alpha]_D = +5^\circ$  ( $c = 0.1$ ,  $CHCl_3$ ). **Source:** Cyanobacterium *Lyngbya majuscula* (macroscopic, Grenada). **Pharm:** Toxic (brine shrimp,  $LD_{50} = 5 \mu\text{g/mL}$ ); cannabinoid receptor binding activity ( $K_i = 4.7 \mu\text{mol/L}$ ). **Ref:** N. Sitachitta, et al, JNP, 1998, 61, 681

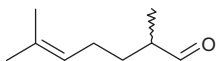
**105 (1E,5Z)-1,6-Dichloro-2-methyl-1,5-heptadien-3-ol**

**Type:** Branched alkenic compounds  $C_8H_{12}Cl_2O$  Oil,  $[\alpha]_D^{28} = -9.8^\circ$  ( $c = 0.01$ ,  $CHCl_3$ ). **Source:** Red alga *Plocamium cruciferum* (New Zealand). **Pharm:** Antimicrobial. **Ref:** J. W. Blunt, et al, Tet. Lett., 1978, 4417 | P. Bates, et al, Aust. J. Chem., 1979, 32, 2545

**106 2,6-Dimethyl-5-heptenal**

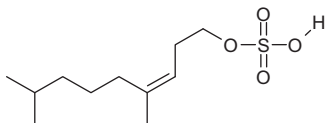
**Type:** Branched alkenic compounds  $C_9H_{16}O$  **Source:** Nudibranch *Malibe leonia* (it feeds upon zooplankton). **Pharm:** Sweet odour. **Ref:** S. W. Ayer, et al, Experientia, 1983, 39, 255





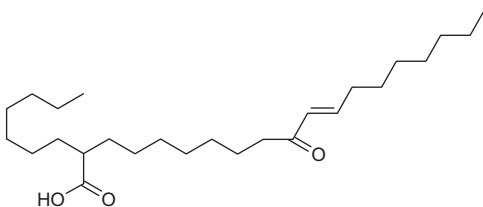
### 107 (3Z)-4,8-Dimethylnon-3-enal sulfate

**Type:** Branched alkenic compounds  $C_{11}H_{22}O_4S$  Powder. **Source:** Ascidian *Microcosmus vulgaris* (Mediterranean Sea), ophiuroid *Ophiocoma echinata* (Columbia). **Pharm:** Antiproliferative (GM7373,  $IC_{50} = 45 \mu\text{g/mL}$ ; J774,  $IC_{50} = 110 \mu\text{g/mL}$ ; WEHI-164,  $IC_{50} = 55 \mu\text{g/mL}$ ; P<sub>388</sub>,  $IC_{50} = 115 \mu\text{g/mL}$ ). **Ref:** A. Aiello, et al, Tetrahedron, 1997, 53, 11489



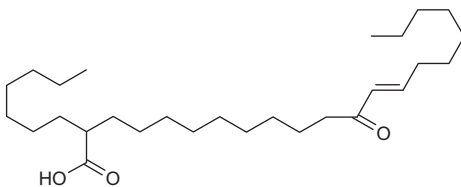
### 108 Ficulinic acid A

**Type:** Branched alkenic compounds  $C_{26}H_{48}O_3$  mp 33–35 °C. **Source:** Sponge *Ficulina ficus*. **Pharm:** Cytotoxic (weak). **Ref:** M. Guyot, et al, JNP, 1986, 49, 307



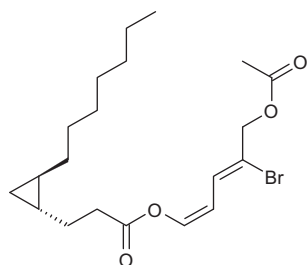
### 109 Ficulinic acid B

**Type:** Branched alkenic compounds  $C_{28}H_{52}O_3$  mp 31–32 °C. **Source:** Sponge *Ficulina ficus*. **Pharm:** Cytotoxic (weak). **Ref:** M. Guyot, et al, JNP, 1986, 49, 307



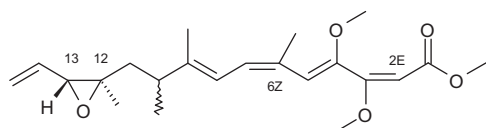
### 110 Grenadadiene

**Type:** Branched alkenic compounds  $C_{20}H_{31}BrO_4$   $[\alpha]_D = -8^\circ$  ( $c = 0.1$ ,  $CHCl_3$ ). **Source:** Cyanobacterium *Lyngbya majuscula* (macroscopic, Grenada). **Pharm:** Cytotoxic (NCI's 60 cell lines, interesting profile of cytotoxicity and has been selected for *in vivo* evaluation). **Ref:** N. Sitachitta, et al, JNP, 1998, 61, 681



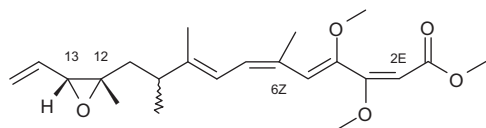
### 111 Haliangicin A

Antibiotic SMP 2 Type: Branched alkenic compounds  $C_{22}H_{32}O_5$  Light yellow oil,  $[\alpha]_D^{22} = +34.6^\circ$  ( $c = 0.3$ , MeOH). Source: Marine myxobacterium *Haliangium ochraceum* AJ13395 Pharm: Antifungal (growth inhibitor of fungi). Ref: R. Fudou, et al, J. Antibiot., 2001, 54, 149; 153 | B. A. Kundim, et al, J. Antibiot., 2003, 56, 630



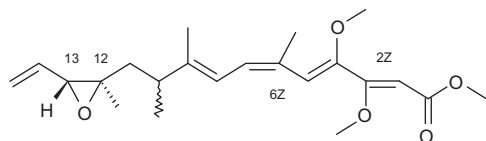
### 112 *cis*-Haliangicin A

Type: Branched alkenic compounds  $C_{22}H_{32}O_5$  Light yellow oil,  $[\alpha]_D^{22} = +29.3^\circ$  ( $c = 0.21$ , MeOH). Source: Marine myxobacterium *Haliangium ochraceum* AJ13395 Pharm: Antifungal. Ref: R. Fudou, et al, J. Antibiot., 2001, 54, 149; 153 | B. A. Kundim, et al, J. Antibiot., 2003, 56, 630

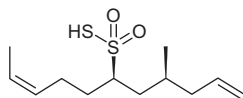


### 113 Haliangicin B

Type: Branched alkenic compounds  $C_{22}H_{32}O_5$  Light yellow oil,  $[\alpha]_D^{22} = +38^\circ$  ( $c = 0.11$ , MeOH). Source: Marine myxobacterium *Haliangium ochraceum* AJ13395 Pharm: Antifungal. Ref: R. Fudou, et al, J. Antibiot., 2001, 54, 149; 153 | B. A. Kundim, et al, J. Antibiot., 2003, 56, 630

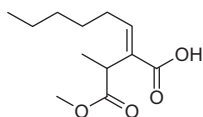






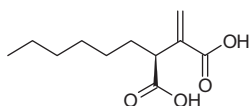
### 118 2-Hexylidene-3-methylsuccinic acid

**Type:** Branched alkenic compounds  $C_{12}H_{20}O_4$  Oil,  $[\alpha]_D^{29} = -15.8^\circ$  ( $c = 0.35$ , MeOH). **Source:** Marine-derived fungus *Halorosellinia oceanica* BCC5149 (Thailand), marine fungus *Halorosellinia oceanica*. **Pharm:** Cytotoxic (KB,  $IC_{50} = 13 \mu\text{g/mL}$ ; BC-1,  $IC_{50} = 5 \mu\text{g/mL}$ ). **Ref:** M. Chinworrungsee, et al, BoMCL, 2001, 11, 1965



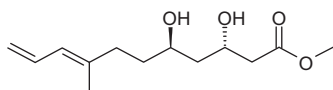
### 119 (S)-Hexylitaconic acid

**Type:** Branched alkenic compounds  $C_{11}H_{18}O_4$  Amorph. solid,  $[\alpha]_D^{23} = -17.9^\circ$  ( $c = 0.5$ , MeOH). **Source:** Marine-derived fungus *Apiospora montagnei* (psychrophilic, cold water, North Sea) from red alga *Polysiphonia violacea* (inner tissue, North Sea). **Pharm:** Inhibits interaction of tumour suppressor p53 with Hdm2 (potentially leading to reactivation of p53 and induction of apoptosis in cancer cells). **Ref:** C. Klemke, et al, JNP, 2004, 67, 1058 | M. D. Lebar, et al, NPR, 2007, 24, 774 (rev)



### 120 leodomycin A

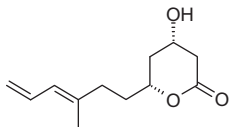
**Type:** Branched alkenic compounds  $C_{13}H_{22}O_4$  Yellowish amorph. solid,  $[\alpha]_D^{23} = +19^\circ$  ( $c = 0.9$ ,  $\text{CHCl}_3$ ). **Source:** Marine-derived bacterium *Bacillus* sp. (sediment, Ieodo, South Korea). **Pharm:** Antibacterial (*Bacillus subtilis* and *Escherichia coli*,  $\text{MIC} = 32\text{--}64 \mu\text{g/mL}$ ); antifungal (yeast *Saccharomyces cerevisiae*,  $\text{MIC} = 256 \mu\text{g/mL}$ ). **Ref:** M. A. M. Mondol, et al, JNP, 2011, 74, 1606



### 121 leodomycin B

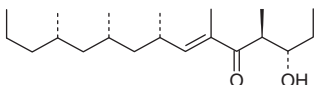
**Type:** Branched alkenic compounds  $C_{12}H_{18}O_3$  White amorph. solid,  $[\alpha]_D^{23} = +21^\circ$  ( $c = 0.9$ ,  $\text{CHCl}_3$ ). **Source:** Marine-derived bacterium *Bacillus* sp. (sediment, Ieodo, South Korea). **Pharm:** Antibacterial (*Bacillus subtilis* and *Escherichia coli*,  $\text{MIC} = 32\text{--}64 \mu\text{g/mL}$ );

antifungal (yeast *Saccharomyces cerevisiae*, MIC = 256 µg/mL). Ref: M. A. M. Mondol, et al, JNP, 2011, 74, 1606



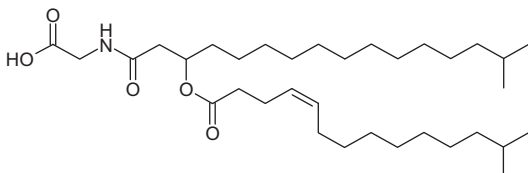
### 122 Isosiphonarienolone

3-Hydroxy-4,6,8,10,12-pentamethyl-6-pentadecen-5-one Type: Branched alkenic compounds C<sub>20</sub>H<sub>38</sub>O<sub>2</sub> Oil, [α]<sub>D</sub><sup>25</sup> = +17.6° (c = 0.17, CHCl<sub>3</sub>). Source: Pulmonate limpet *Siphonaria pectinata* (Cádiz, Spain). Pharm: Cytotoxic (P<sub>388</sub>, A549, HT29 and MEL28, all ED<sub>50</sub> ≥ 10 µg/mL). Ref: M.C. Paul, et al, Tetrahedron, 1997, 53, 2303



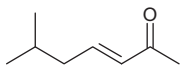
### 123 N-[15-Methyl-3-(13-methyl-4-tetradecenoyloxy)hexadecanoyl]glycine

Type: Branched alkenic compounds C<sub>34</sub>H<sub>63</sub>NO<sub>5</sub> mp 70–71 °C, [α]<sub>D</sub><sup>25</sup> = +0.45° (c = 7.92, CHCl<sub>3</sub>). Source: Marine bacterium *Cytophaga* sp. Pharm: N-type Ca<sup>2+</sup> channel blocker. Ref: T. Morishita, et al, J. Antibiot., 1997, 50, 457



### 124 7-Methyloct-4-en-3-one

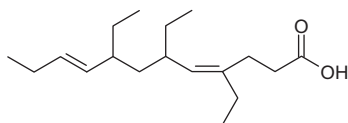
Type: Branched alkenic compounds C<sub>8</sub>H<sub>14</sub>O Oil, bp<sub>30mmHg</sub> 92–94 °C. Source: Sponge *Plakortis zygompha* (Belize). Pharm: Sweet odour. Ref: D. J. Faulkner, et al, Tet. Lett., 1980, 21, 23



### 125 Monotriajaponide A

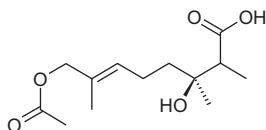
4,6,8-Triethyl-2,4,9-dodecatrienoic acid Type: Branched alkenic compounds C<sub>18</sub>H<sub>32</sub>O<sub>2</sub> Viscous oil, [α]<sub>D</sub> = +63° (c = 0.09, CHCl<sub>3</sub>). Source: sponge *Monotria japonica*. Pharm: Oocyte-lytic activity (selectively lyses immature starfish oocytes *Asterina pectinifera*,

without affecting nuclear morphology, MEC = 50 µg/mL). Ref: M. Yanai, et al, BoMC, 2003, 11, 1715



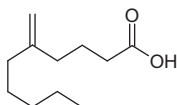
### 126 Penicimonoterpene

Type: Branched alkenic compounds  $C_{13}H_{22}O_5$  Colorless oil,  $[\alpha]_D^{20} = +1.4^\circ$  ( $c = 0.83$ , MeOH). Source: Marine-derived fungus *Penicillium chrysogenum* QEN-24S from red alga *Laurencia* sp. (Weizhou I., Guangxi, China). Pharm: Antifungal (20 µg, *Aspergillus brassicae*, IZD = 17 mm, control Amphotericin B, IZD = 18 mm; *Aspergillus niger*, slight inhibition, Amphotericin B, IZD = 24 mm). Ref: S. -S. Gao, et al, Mar. Drugs, 2011, 9, 59



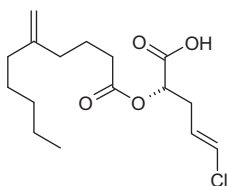
### 127 Pitinoic acid A

Type: Branched alkenic compounds  $C_{11}H_{20}O_2$  Source: Cyanobacterium *Lyngbya-like* sp. (Piti Bay, Guam). Pharm: Inhibits quorum sensing in *Pseudomonas aeruginosa*. Ref: C. M. Pavlik, et al, JNP, 2013, 76, 2026



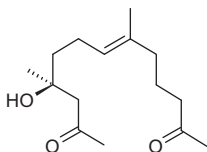
### 128 Pitinoic acid B

Type: Branched alkenic compounds  $C_{16}H_{25}ClO_4$  Source: Cyanobacterium *Lyngbya-like* sp. (Piti Bay, Guam). Pharm: Anti-inflammatory (inhibiting production of pro-inflammatory cytokine expression). Ref: C. M. Pavlik, et al, JNP, 2013, 76, 2026

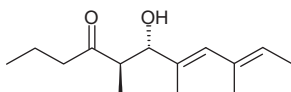


**129 Pseudoalteromone B**

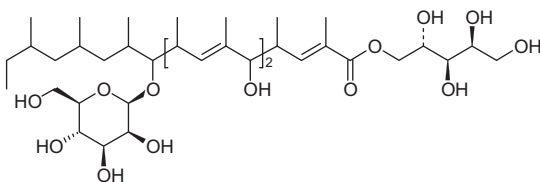
**Type:** Branched alkenic compounds  $C_{15}H_{26}O_3$  Colorless oil,  $[\alpha]_D^{23} = -20^\circ$  ( $c = 0.03$ ,  $CHCl_3$ ). **Source:** Marine-derived bacterium *Pseudoalteromonas* sp. CGH2XX from soft coral *Lobophytum crassum* (cultured-type, Taiwan). **Pharm:** Anti-inflammatory (modest). **Ref:** Y. -H. Chen, et al, Mar. Drugs, 2012, 10, 1566

**130 Pteroenone**

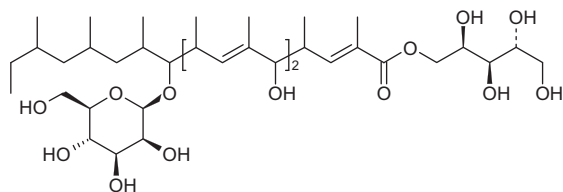
**Type:** Branched alkenic compounds  $C_{14}H_{24}O_2$   $[\alpha]_D = +48^\circ$  ( $c = 0.6$ , hexane). **Source:** Gymnosomata *Clione antarctica* (psychrophilic, cold water, shell-less pelagic mollusc pteropod). **Pharm:** Antifeedant. **Ref:** W. Y. Yoshida, et al, JOC, 1995, 60, 780 | P. J. Bryan, et al, Mar. Biol., 1995, 122, 271 | M. D. Lebar, et al, NPR, 2007, 24, 774 (rev)

**131 Roselipin 1A**

**Type:** Branched alkenic compounds  $C_{40}H_{72}O_{14}$  Powder, mp 36–37 °C,  $[\alpha]_D^{24} = +12^\circ$  ( $c = 0.1$ , MeOH). **Source:** Marine-derived fungus *Gliocladium roseum* KF-1040. **Pharm:** Diacylglycerol acyltransferase (DGAT) inhibitor. **Ref:** S. Omura, et al, J. Antibiot., 1999, 52, 586 | H. Tomoda, et al, J. Antibiot., 1999, 52, 689 | N. Tabata, et al, J. Antibiot., 1999, 52, 815

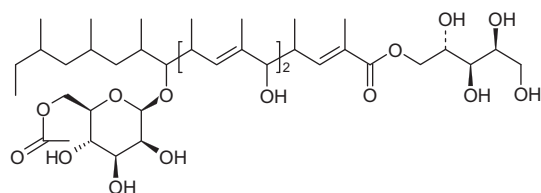
**132 Roselipin 1B**

**Type:** Branched alkenic compounds  $C_{40}H_{72}O_{14}$  Powder, mp 35–36 °C,  $[\alpha]_D^{24} = +8^\circ$  ( $c = 0.1$ , MeOH). **Source:** Marine-derived fungus *Gliocladium roseum* KF-1040. **Pharm:** Diacylglycerol acyltransferase (DGAT) inhibitor. **Ref:** S. Omura, et al, J. Antibiot., 1999, 52, 586 | H. Tomoda, et al, J. Antibiot., 1999, 52, 689 | N. Tabata, et al, J. Antibiot., 1999, 52, 815



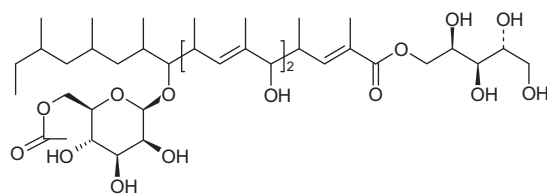
### 133 Roselipin 2A

**Type:** Branched alkenic compounds  $C_{42}H_{74}O_{15}$   $[\alpha]_D^{24} = +22^\circ$  ( $c = 0.1$ , MeOH). **Source:** Marine-derived fungus *Gliocladium roseum* KF-1040. **Pharm:** Diacylglycerol acyltransferase (DGAT) inhibitor. **Ref:** S. Omura, et al, J. Antibiot., 1999, 52, 586 | H. Tomoda, et al, J. Antibiot., 1999, 52, 689 | N. Tabata, et al, J. Antibiot., 1999, 52, 815



### 134 Roselipin 2B

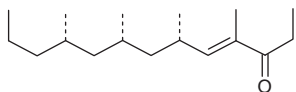
**Type:** Branched alkenic compounds  $C_{42}H_{74}O_{15}$   $[\alpha]_D^{24} = +10^\circ$  ( $c = 0.1$ , MeOH). **Source:** Marine-derived fungus *Gliocladium roseum* KF-1040. **Pharm:** Diacylglycerol acyltransferase (DGAT) inhibitor. **Ref:** S. Omura, et al, J. Antibiot., 1999, 52, 586 | H. Tomoda, et al, J. Antibiot., 1999, 52, 689 | N. Tabata, et al, J. Antibiot., 1999, 52, 815



### 135 Siphonarienone

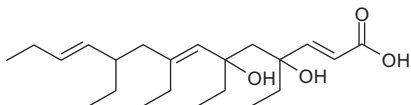
4,6,8,10-Tetramethyl-4-tridecen-3-one **Type:** Branched alkenic compounds  $C_{17}H_{32}O$  Oil,  $[\alpha]_D = +13.3^\circ$  ( $c = 0.7$ ,  $CHCl_3$ ). **Source:** Pulmonate limpets *Siphonaria pectinata* (Cádiz, Spain,  $6^\circ18'W36^\circ32'N$ ) and *Siphonaria grisea*. **Pharm:** Cytotoxic ( $P_{388}$ , A549, HT29 and MEL28, all  $ED_{50} \geq 10 \mu g/mL$ ); antibacterial (gram-positive bacteria). **Ref:** M. Norte, et al, Tetrahedron, 1990, 46, 1669 | M.C. Paul, et al, Tetrahedron, 1997, 53, 2303



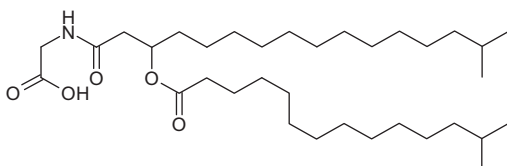
**136 4,6,8,10-Tetraethyl-4,6-dihydroxy-2,7,11-tetradecatrienoic acid**

Type: Branched alkenic compounds  $C_{22}H_{38}O_4$  Oil,  $[\alpha]_D = +1.2^\circ$  ( $c = 0.33$ ,  $CHCl_3$ ).

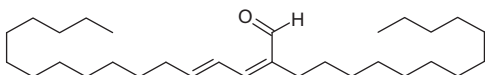
Source: Sponge *Plakortis halichondrioides* (Jamaica). Pharm: Cytotoxic ( $P_{388}$ ,  $IC_{50} = 10 \mu\text{g/mL}$ ). Ref: A. Rudi, et al, JNP, 1993, 56, 1827

**137 Topostin B 567**

Type: Branched alkenic compounds  $C_{34}H_{65}NO_5$  Source: Marine bacteria *Cytophaga johnsone* and *Cytophaga* sp., eubacterium *Flexibacter topostinus*. Pharm: N-type  $Ca^{2+}$  channel blocker. Ref: T. Morishita, et al, J. Antibiot., 1997, 50, 457

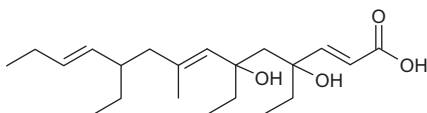
**138 (2E,4E)-2-Tridecyl-heptadeca-2,4-dienal**

Type: Branched alkenic compounds  $C_{30}H_{56}O$  Source: Red alga *Corallina mediterranea* (Alicante Spain). Pharm: Anti-inflammatory; cytotoxic;  $LD_{50} = 125 \mu\text{g/mL}$ . Ref: S. De Rosa, et al, Phytochemistry, 1995, 40, 995

**139 4,6,10-Triethyl-4,6-dihydroxy-8-methyl-2,7,11-tetradecatrienoic acid**

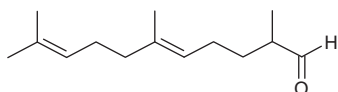
Type: Branched alkenic compounds  $C_{21}H_{36}O_4$  Oil,  $[\alpha]_D = +4.8^\circ$  ( $c = 0.46$ ,  $CHCl_3$ ).

Source: Sponge *Plakortis halichondrioides* (Jamaica). Pharm: Cytotoxic ( $P_{388}$ ,  $IC_{50} = 10 \mu\text{g/mL}$ ). Ref: A. Rudi, et al, JNP, 1993, 56, 1827

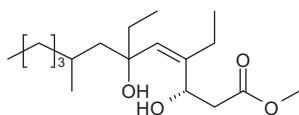


**140 2,6,10-Trimethyl-5,9-undecadienal**

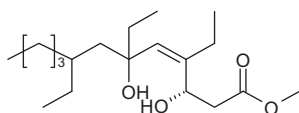
Type: Branched alkenic compounds  $C_{14}H_{24}O$  Sweet smelling oil. Source: Nudibranch *Anisodoris nobilis*. Pharm: Fruity odour. Ref: K. Gustafson, et al, Tetrahedron, 1985, 41, 1101

**141 Woodylide A**

Type: Branched alkenic compounds  $C_{18}H_{34}O_4$  Colorless oil,  $[\alpha]_D^{22} = -15.0^\circ$  ( $c = 0.06$ , MeOH). Source: Sponge *Plakortis simplex* (Yongxing I., South China Sea, China). Pharm: Antifungal (*Cryptococcus neoformans* ATCC 90113,  $IC_{50} = 3.67 \mu\text{g/mL}$ , control Amphotericin B,  $IC_{50} = 0.35 \mu\text{g/mL}$ ; *Candida albicans* Y0109, MIC =  $32 \mu\text{g/mL}$ , control Fluconazole, MIC =  $0.25 \mu\text{g/mL}$ ; *Trichophyton rubrum*, MIC =  $32 \mu\text{g/mL}$ , Fluconazole, MIC =  $2 \mu\text{g/mL}$ ; *Microsporum gypseum*, MIC =  $32 \mu\text{g/mL}$ , Fluconazole, MIC =  $8 \mu\text{g/mL}$ ); cytotoxic (A549,  $IC_{50} = 37.83 \mu\text{g/mL}$ ; HeLa,  $IC_{50} = 11.22 \mu\text{g/mL}$ ; QGY-7703,  $IC_{50} = 25.80 \mu\text{g/mL}$ ; MDA231, inactive); cytotoxic (HeLa,  $IC_{50} = (15.5 \pm 1.2) \mu\text{mol/L}$ ; K562,  $IC_{50} = (23.8 \pm 1.2) \mu\text{mol/L}$ ; A549,  $IC_{50} = (29.3 \pm 2.5) \mu\text{mol/L}$ ; Bel7402,  $IC_{50} > 100 \mu\text{mol/L}$ , control Adriamycin: HeLa,  $IC_{50} = (0.6 \pm 0.0) \mu\text{mol/L}$ ; K562,  $IC_{50} = (0.3 \pm 0.0) \mu\text{mol/L}$ ; A549,  $IC_{50} = (0.2 \pm 0.0) \mu\text{mol/L}$ ) (Zhang, 2013). Ref: H. -B. Yu, et al, Mar. Drugs, 2012, 10, 1027 | J. Zhang, et al, JNP, 2013, 76, 600

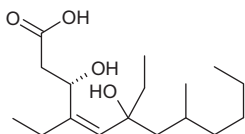
**142 Woodylide B**

Type: Branched alkenic compounds  $C_{19}H_{36}O_4$  Colorless oil,  $[\alpha]_D^{22} = +5.5^\circ$  ( $c = 0.06$ , MeOH). Source: Sponge *Plakortis simplex* (Yongxing I., South China Sea, China). Pharm: Cytotoxic (HeLa,  $IC_{50} = (15.9 \pm 1.1) \mu\text{mol/L}$ ; K562,  $IC_{50} = (20.0 \pm 1.9) \mu\text{mol/L}$ ; A549,  $IC_{50} = (23.6 \pm 1.2) \mu\text{mol/L}$ ; Bel7402,  $IC_{50} > 100 \mu\text{mol/L}$ , control Adriamycin: HeLa,  $IC_{50} = (0.6 \pm 0.0) \mu\text{mol/L}$ ; K562,  $IC_{50} = (0.3 \pm 0.0) \mu\text{mol/L}$ ; A549,  $IC_{50} = (0.2 \pm 0.0) \mu\text{mol/L}$ ) (Zhang, 2013). Ref: H. -B. Yu, et al, Mar. Drugs, 2012, 10, 1027 | J. Zhang, et al, JNP, 2013, 76, 600

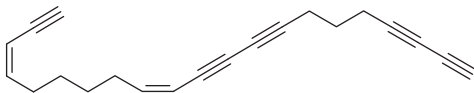


**143 Woodylide C**

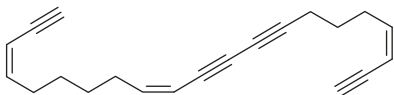
**Type:** Branched alkenic compounds  $C_{17}H_{32}O_4$  Light yellow oil,  $[\alpha]_D^{22} = -11.4^\circ$  ( $c = 0.14$ , MeOH). **Source:** Sponge *Plakortis simplex* (Yongxing I., South China Sea, China). **Pharm:** Antifungal (*Cryptococcus neoformans* ATCC 90113,  $IC_{50} = 10.85 \mu\text{g/mL}$ , control Amphotericin B,  $IC_{50} = 0.35 \mu\text{g/mL}$ ; *Candida albicans* Y0109, inactive, control Fluconazole,  $MIC = 0.25 \mu\text{g/mL}$ ; *Trichophyton rubrum*,  $MIC = 32 \mu\text{g/mL}$ , Fluconazole,  $MIC = 2 \mu\text{g/mL}$ ; *Microsporium gypseum*,  $MIC = 32 \mu\text{g/mL}$ , Fluconazole,  $MIC = 8 \mu\text{g/mL}$ ); cytotoxic (HCT116,  $IC_{50} = 9.4 \mu\text{g/mL}$ ); PTP1B inhibitor ( $IC_{50} = 4.7 \mu\text{g/mL}$ , control Sodium orthovanadate,  $IC_{50} = 88.46 \mu\text{g/mL}$ ). **Ref:** H. -B. Yu, et al, Mar. Drugs, 2012, 10, 1027

**1.3 Acetylenic Compounds****144 Callyberyne A**

Callypentaene; (Z,Z)-12,18-Heneicosadiene-1,3,8,10,20-pentayne **Type:** Acetylenic hydrocarbons.  $C_{21}H_{20}$  Oil **Source:** Sponges *Callyspongia truncata* (Japan waters) and *Callyspongia* sp. **Pharm:** Induces metamorphosis (larvae of ascidian *Halocynthia roretzi*,  $ED_{100} = 0.25 \mu\text{g/mL}$ ). **Ref:** S. Tsukamoto, et al, JNP, 1997, 60, 126

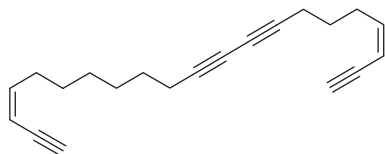
**145 Callyberyne B**

3,12,18-Heneicosatriene-1,8,10,20-tetraene **Type:** Acetylenic hydrocarbons.  $C_{21}H_{22}$  Oil. **Source:** Sponge *Callyspongia* sp. (Japan waters). **Pharm:** Induces metamorphosis (larvae of ascidian *Halocynthia roretzi*,  $ED_{100} = 0.13 \mu\text{g/mL}$ ); antifoulant (barnacle *Balanus amphitrite*,  $ED_{50} = 0.24 \mu\text{g/mL}$ ). **Ref:** A. Umeyama, et al, JNP, 1997, 60, 131

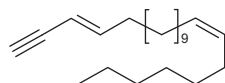


**146 Callytetrayne**

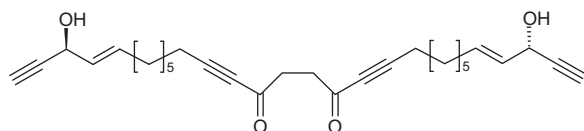
**Type:** Acetylenic hydrocarbons.  $C_{21}H_{24}$  Oil. **Source:** Sponges *Callyspongia truncata* (Japan waters) and *Callyspongia* sp. nov. **Pharm:** Induces metamorphosis (larvae of ascidian *Halocynthia roretzi*,  $ED_{100} = 0.25 \mu\text{g/mL}$ ); antifoulant ( $ED_{50} = 30 \mu\text{g/mL}$ ). **Ref:** S. Tsukamoto, et al, JNP, 1997, 60, 126 | A. Umeyama, et al, JNP, 1997, 60, 131

**147 (3E,15Z)-3,15-Docosadien-1-yne**

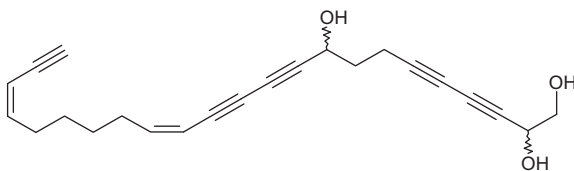
**Type:** Acetylenic hydrocarbons.  $C_{22}H_{38}$  **Source:** Sponge *Cribrochalina vasculum* (Bahamas). **Pharm:** Toxic (brine shrimp). **Ref:** A. Aiello, et al, JNP, 1992, 55, 1275

**148 Adociacetylene D**

3,28-Dihydroxy-4,26-triacontadiene-1,12,18,29-tetrayne-14,17-dione **Type:** Acetylenic alcohols.  $C_{30}H_{38}O_4$  Pale yellow oil,  $[\alpha]_D^{22} = +18.1^\circ$  ( $c = 1$ ,  $\text{CHCl}_3$ ),  $[\alpha]_D^{22} = +6^\circ$  ( $c = 0.1$ ,  $\text{CHCl}_3$ ), **Source:** Sponge *Asocia* sp. (Okinawa). **Pharm:** Cytotoxic (endothelial cell-neutrophil leukocyte adhesin assay, tumor necrosis factor- $\alpha$  (5JRJ/mL)-stimulated endothelial cells,  $1 \mu\text{g/mL}$ ). **Ref:** M. Kobayashi, et al, CPB, 1996, 44, 720

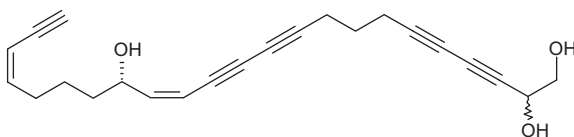
**149 Callytriol A**

14,20-Tricosadiene-3,5,10,12,22-pentayne-1,2,9-triol **Type:** Acetylenic alcohols.  $C_{23}H_{24}O_3$  Yellow oil. **Source:** Sponge *Callyspongia truncata* (Japan waters). **Pharm:** Induces metamorphosis (larvae of ascidian *Halocynthia roretzi*,  $ED_{100} = 0.25 \mu\text{g/mL}$ ); antifoulant (barnacle *Balanus amphitrite*,  $ED_{50} = 4.5 \mu\text{g/mL}$ ). **Ref:** S. Tsukamoto, et al, JNP, 1997, 60, 126



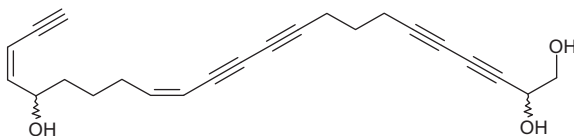
### 150 Callytriol B

**Type:** Acetylenic alcohols.  $C_{23}H_{24}O_3$  Yellow oil,  $[\alpha]_D^{25} = +0.96^\circ$  ( $c = 0.078$ , MeOH).  
**Source:** Sponge *Callyspongia truncata* (Japan waters). **Pharm:** Induces metamorphosis (larvae of ascidian *Halocynthia roretzi*,  $ED_{100} = 1.3 \mu\text{g/mL}$ ); antifoulant (barnacle *Balanus amphitrite*,  $ED_{50} = 0.43 \mu\text{g/mL}$ ). **Ref:** S. Tsukamoto, et al, JNP, 1997, 60, 126



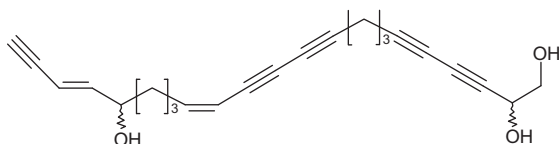
### 151 Callytriol C

**Type:** Acetylenic alcohols.  $C_{23}H_{24}O_3$  Yellow oil,  $[\alpha]_D^{25} = -4.5^\circ$  ( $c = 0.05$ , MeOH).  
**Source:** Sponge *Callyspongia truncata* (Japan waters). **Pharm:** Induces metamorphosis (larvae of ascidian *Halocynthia roretzi*,  $ED_{100} = 1.3 \mu\text{g/mL}$ ); antifoulant (barnacle *Balanus amphitrite*,  $ED_{50} = 0.63 \mu\text{g/mL}$ ). **Ref:** S. Tsukamoto, et al, JNP, 1997, 60, 126



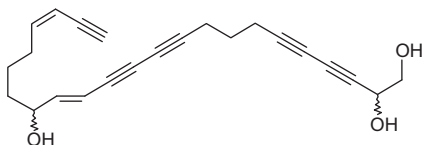
### 152 Callytriol D

**Type:** Acetylenic alcohols.  $C_{23}H_{24}O_3$  Yellow oil,  $[\alpha]_D^{25} = -1.5^\circ$  ( $c = 0.03$ , MeOH).  
**Source:** Sponge *Callyspongia truncata* (Japan waters). **Pharm:** Induces metamorphosis (larvae of ascidian *Halocynthia roretzi*,  $ED_{100} = 0.13 \mu\text{g/mL}$ ); antifoulant (barnacle *Balanus amphitrite*,  $ED_{50} = 0.24 \mu\text{g/mL}$ ). **Ref:** S. Tsukamoto, et al, JNP, 1997, 60, 126

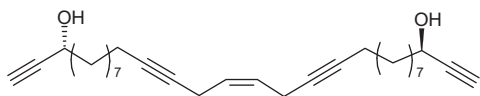


**153 Callytriol E**

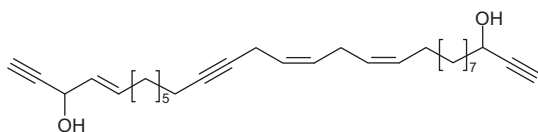
(2*ξ*,14*E*,16*ξ*,20*Z*)-14,20-Tricosadiene-3,5,10,12,22-pentayne-1,2,16-triol **Type:** Acetylenic alcohols.  $C_{23}H_{24}O_3$  Yellow oil,  $[\alpha]_D^{25} = -1.6^\circ$  ( $c = 0.046$ , MeOH). **Source:** Sponge *Callyspongia truncata* (Japan waters). **Pharm:** Induces metamorphosis (larvae of ascidian *Halocynthia roretzi*,  $ED_{100} = 1.3 \mu\text{g/mL}$ ); antifoulant (barnacle *Balanus amphitrite*,  $ED_{50} = 0.38 \mu\text{g/mL}$ ). **Ref:** S. Tsukamoto, et al, JNP, 1997, 60, 126

**154 Dideoxypetrosynol D**

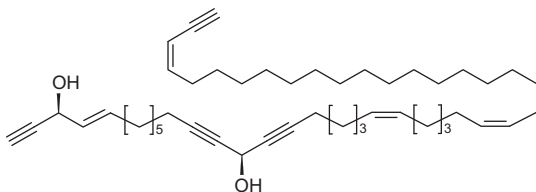
15-Triacontene-1,12,18,29-tetrayne-3,28-diol **Type:** Acetylenic alcohols.  $C_{30}H_{44}O_2$  Amorph. solid,  $[\alpha]_D^{23} = +38^\circ$  ( $c = 0.05$ ,  $\text{CHCl}_3$ ). **Source:** Sponge *Petrosia* sp. (Korea waters). **Pharm:** Cytotoxic (hmn: A549, SK-OV-3, SK-MEL-2, XF498, HCT15). **Ref:** A. Guerriero, et al, Tet. Lett., 1998, 39, 6395 | J. S. Kim, et al, Tetrahedron, 1999, 55, 2113

**155 Dideoxypetrosynol F**

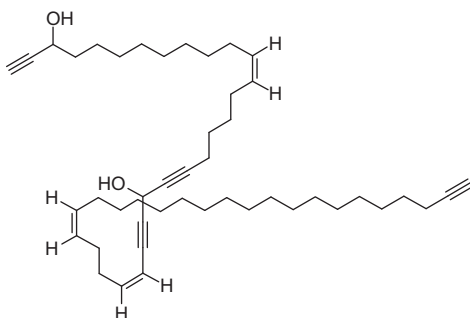
**Type:** Acetylenic alcohols.  $C_{30}H_{44}O_2$  Amorph. solid. **Source:** Sponge *Petrosia* sp. (Korea waters). **Pharm:** Cytotoxic (A549, SK-OV-3, SK-MEL-2, XF498, HCT15, all  $ED_{50s} > 3.0 \mu\text{g/mL}$ ). **Ref:** J. S. Kim, et al, JNP, 1999, 62, 554 | Y. J. Lim, et al, JNP, 1999, 62, 1215

**156 Dihomopetrocortyne A**

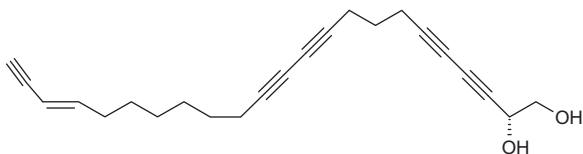
**Type:** Acetylenic alcohols.  $C_{48}H_{74}O_2$  **Source:** Sponge *Petrosia* sp. (Korea waters). **Pharm:** Cytotoxic (A549,  $ED_{50} = 5.2 \mu\text{g/mL}$ ; SK-OV-3,  $ED_{50} = 5.1 \mu\text{g/mL}$ ; SK-MEL-2,  $ED_{50} = 1.6 \mu\text{g/mL}$ ; XF498,  $ED_{50} = 5.8 \mu\text{g/mL}$ ; HCT15,  $ED_{50} = 3.9 \mu\text{g/mL}$ ; control Cisplatin: A549,  $ED_{50} = 0.7 \mu\text{g/mL}$ ; SK-OV-3,  $ED_{50} = 1.3 \mu\text{g/mL}$ ; SK-MEL-2,  $ED_{50} = 1.0 \mu\text{g/mL}$ ; XF498,  $ED_{50} = 0.7 \mu\text{g/mL}$ ; HCT15,  $ED_{50} = 1.1 \mu\text{g/mL}$ ); DNA replication inhibitor (SV40 DNA replication,  $20 \mu\text{mol/L}$ , InRt = 21%;  $40 \mu\text{mol/L}$ , InRt = 38%). **Ref:** Y. J. Lim, et al, JNP, 2001, 64, 1565

**157 4,5-Dihydroisopetroformyne 3**

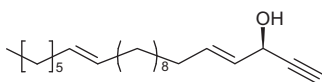
12,23,27-Hexatetracontatriene-1,18,21,45-tetrayne-3,20-diol Type: Acetylenic alcohols.  $C_{46}H_{72}O_2$  Oil,  $[\alpha]_D^{21} = +1.8^\circ$  ( $c = 0.2$ ,  $CHCl_3$ ). Source: Sponge *Petrosia ficiformis* (Mediterranean Sea). Pharm: Toxic (brine shrimp). Ref: Y. Guo, et al, JNP, 1995, 58, 712

**158 14,15-Dihydrosiphonodiol**

Type: Acetylenic alcohols.  $C_{23}H_{26}O_2$  Source: Sponge *Siphonochalina truncata*. Pharm: HK-ATPase inhibitor. Ref: N. Fusetani, et al, Tet. Lett., 1987, 28, 4311

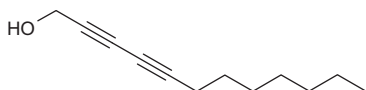
**159 4,15-Docosadien-1-yn-3-ol**

Type: Acetylenic alcohols.  $C_{22}H_{38}O$   $[\alpha]_D = -44^\circ$  ( $c = 0.2$ , MeOH). Source: Sponge *Cribrochalina vasculum*. Pharm: Immunossuppressive; cytotoxic. Ref: S. P. Gunasekera, et al, JOC, 1990, 55, 6223 | A. Aiello, et al, JNP, 1992, 55, 1275 | B. A. Kulkarni, et al, JOC, 1993, 58, 5964 | Y. F. Hallock, et al, JNP, 1995, 58, 1801 | T. Ohtani, et al, JCS Perkin I, 1996, 961

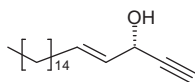


**160 2,4-Dodecadiyn-1-ol**

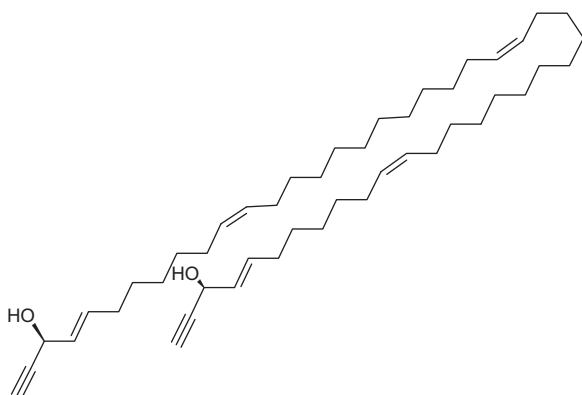
Dodecane-2,4-diyne-1-ol Type: Acetylenic alcohols.  $C_{12}H_{18}O$  mp 34–36 °C. Source: Stony coral *Montipora digitata* (eggs). Pharm: Cytotoxic (A549,  $ED_{50} = 5.48 \mu\text{g/mL}$ ; SK-OV-3,  $ED_{50} = 4.63 \mu\text{g/mL}$ ; SK-MEL-2,  $ED_{50} = 4.45 \mu\text{g/mL}$ ; XF498,  $ED_{50} = 5.59 \mu\text{g/mL}$ ; HCT15,  $ED_{50} = 5.90 \mu\text{g/mL}$ ; control Cisplatin: A549,  $ED_{50} = 0.75 \mu\text{g/mL}$ ; SK-OV-3,  $ED_{50} = 1.09 \mu\text{g/mL}$ ; SK-MEL-2,  $ED_{50} = 2.18 \mu\text{g/mL}$ ; XF498,  $ED_{50} = 1.18 \mu\text{g/mL}$ ; HCT15,  $ED_{50} = 0.85 \mu\text{g/mL}$ ). Ref: J. C. Coll, et al, Mar. Biol. (Berlin), 1994, 118, 177 | N. Alam, et al, JNP, 2001, 64, 1059

**161 (3S,4E)-Eicos-4-en-1-yn-3β-ol**

Type: Acetylenic alcohols.  $C_{20}H_{36}O$  Solid,  $[\alpha]_D = +18.3^\circ$  ( $c = 0.4$ , MeOH) (+3.8°). Source: Sponge *Cribrochalina vasculum*. Pharm: Cytotoxic (H522 and IGROV1). Ref: Y. F. Hallock, et al, JNP, 1995, 58, 1801 | A. Sharma et al, Tetrahedron: Asymmetry, 1998, 9, 2635 | W. Lu, et al, Tetrahedron, 1999, 55, 4649 | J. Garcia, et al, Tetrahedron: Asymmetry, 1999, 10, 2617

**162 Fulvinol**

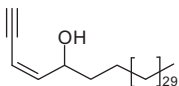
4,11,23,35,42-Hexatetracontapentaene-1,45-diyne-3,44-diol Type: Acetylenic alcohols.  $C_{46}H_{76}O_2$  Cryst. (petrol/EtOAc), mp 35–37 °C,  $[\alpha]_D^{25} = -14.8^\circ$  ( $c = 0.4$ ,  $CHCl_3$ ). Source: Sponge *Reniera fulva* (Spain). Pharm: Cytotoxic ( $P_{388}$ , A549, HT29 and MEL28, all  $ED_{50} = 1 \mu\text{g/mL}$ ). Ref: M. J. Ortega, et al, JNP, 1996, 59, 1069



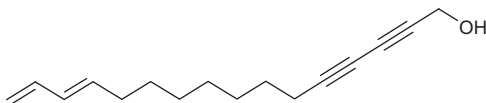


**163 (3Z,5E)-3-Heptatriaconten-1-yn-5-ol**

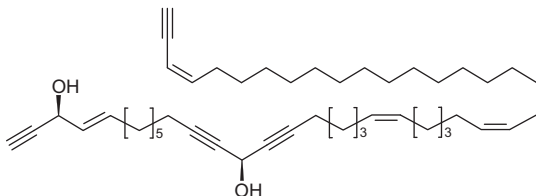
**Type:** Acetylenic alcohols.  $C_{37}H_{70}O$   $[\alpha]_D = -18.3^\circ$  ( $c = 0.8$ , MeOH). **Source:** Sponge *Reniochalina* sp. (Chuuk State, Federated States of Micronesia). **Pharm:** Cytotoxic (ACHN, NCI-H23, MDA-MB-231, HCT15, NUGC-3, and PC3, all  $GI_{50} > 10 \mu\text{g/mL}$ , control Adriamycin,  $GI_{50} = (0.198-0.708) \mu\text{g/mL}$ ). **Ref:** H. -S. Lee, et al, *Lipids*, 2009, 44, 71

**164 13,15-Hexadecadiene-2,4-diyn-1-ol**

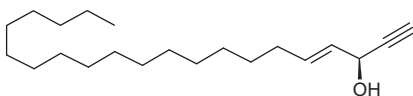
**Type:** Acetylenic alcohols.  $C_{16}H_{22}O$  **Source:** Stony corals *Montipora* sp. and *Pectinia lactuca*. **Pharm:** Ichthyotoxic; antimicrobial. **Ref:** T. Higa, et al, *Chem. Lett.*, 1990, 145

**165 Homo-(3S,14S)-petrocortyne A**

**Type:** Acetylenic alcohols.  $C_{47}H_{72}O_2$  Yellow oil. **Source:** Sponge *Petrosia* sp. (Korea waters). **Pharm:** DNA replication inhibitor (simian virus SV40, 125  $\mu\text{mol/L}$ , InRt = 59%, 250  $\mu\text{mol/L}$ , InRt = 86%, 500  $\mu\text{mol/L}$ , InRt = 100%); cytotoxic (A549,  $ED_{50} = 11.3 \mu\text{g/mL}$ ; SK-OV-3,  $ED_{50} = 2.2 \mu\text{g/mL}$ ; SK-MEL-2,  $ED_{50} = 0.8 \mu\text{g/mL}$ ; XF498,  $ED_{50} = 2.5 \mu\text{g/mL}$ ; HCT15,  $ED_{50} = 1.7 \mu\text{g/mL}$ ; control Cisplatin, A549,  $ED_{50} = 0.6 \mu\text{g/mL}$ ; SK-OV-3,  $ED_{50} = 0.9 \mu\text{g/mL}$ ; SK-MEL-2,  $ED_{50} = 0.7 \mu\text{g/mL}$ ; XF498,  $ED_{50} = 0.6 \mu\text{g/mL}$ ; HCT15,  $ED_{50} = 0.6 \mu\text{g/mL}$ ). **Ref:** Y. J. Lim, et al, *JNP*, 2001, 64, 46

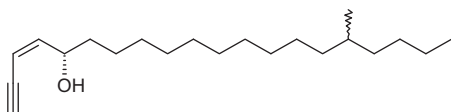
**166 (3S,4E)-3-Hydroxyheeneicos-4-en-1-yne**

**Type:** Acetylenic alcohols.  $C_{21}H_{38}O$  Solid,  $[\alpha]_D = +11.0^\circ$  ( $c = 0.21$ , MeOH). **Source:** Sponge *Cribrochalina vasculum*. **Pharm:** Cytotoxic (*in vitro*, H522 and IGROV1). **Ref:** Y. F. Hallock, et al, *JNP*, 1995, 58, 1801

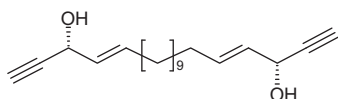


**167 (5S,3Z)-5-Hydroxy-16-methyleicos-3-en-1-yne**

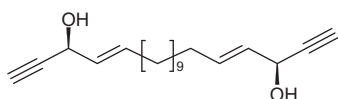
**Type:** Acetylenic alcohols.  $C_{21}H_{38}O$  Oil,  $[\alpha]_D = -23.1^\circ$  ( $c = 0.33$ , MeOH). **Source:** Sponge *Cribrochalina vasculum*. **Pharm:** Cytotoxic (*in vitro*, H522 and IGROV1). **Ref:** Y. F. Hallock, et al, JNP, 1995, 58, 1801

**168 (-)-(3R,4E,16E,18R)-icosa-4,16-diene-1,19-diyne-3,18-diol**

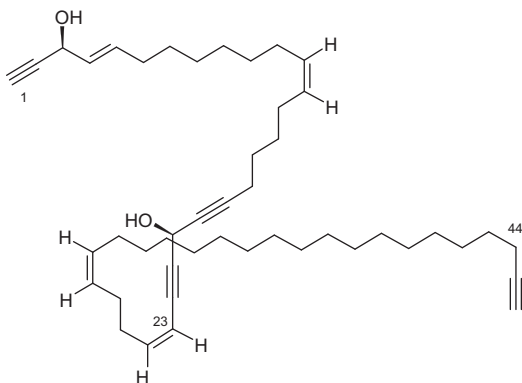
**Type:** Acetylenic alcohols.  $C_{20}H_{30}O_2$  White amorphous powder,  $[\alpha]_D^{24} = -30.0^\circ$  ( $c = 0.13$ , MeOH). **Source:** Sponge *Callyspongia* sp. (Iriomote I., Okinawa, Japan). **Pharm:** Cytotoxic (temperature sensitive rat lymphatic endothelial TR-Le cells,  $IC_{50} = 0.11 \mu\text{mol/L}$ , 1-yne-3-ol moiety as an essential pharmacophore). **Ref:** T. Shirouzu, et al, JNP, 2013, 76, 1337

**169 (+)-(3S,4E,16E,18S)-Icosa-4,16-diene-1,19-diyne-3,18-diol**

**Type:** Acetylenic alcohols.  $C_{20}H_{30}O_2$  White amorphous powder,  $[\alpha]_D^{24} = +24.5^\circ$  ( $c = 0.10$ , MeOH). **Source:** Sponge *Callyspongia* sp. (Iriomote I., Okinawa, Japan). **Pharm:** Cytotoxic (temperature sensitive rat lymphatic endothelial TR-Le cells,  $IC_{50} = 0.47 \mu\text{mol/L}$ , 1-yne-3-ol moiety as an essential pharmacophore). **Ref:** T. Shirouzu, et al, JNP, 2013, 76, 1337

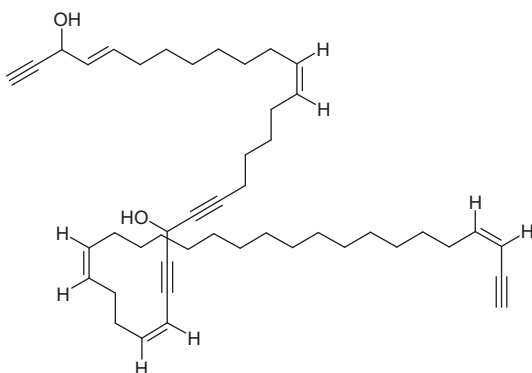
**170 Isopetroformyne 3**

**Type:** Acetylenic alcohols.  $C_{46}H_{70}O_2$  Pale yellow oil,  $[\alpha]_D^{21} = +20^\circ$  ( $c = 0.06$ ,  $CHCl_3$ ). **Source:** Sponge *Petrosia ficiformis* (Mediterranean Sea). **Pharm:** Toxic (brine shrimp). **Ref:** Y. Guo, et al, JNP, 1995, 58, 712

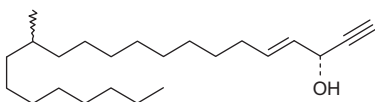
**171 Isopetroformyne 4**

Type: Acetylenic alcohols.  $C_{46}H_{68}O_2$  Pale yellow oil,  $[\alpha]_D^{21} = +25^\circ$  ( $c = 0.10$ ,  $CHCl_3$ ).

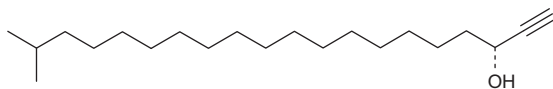
Source: Sponge *Petrosia ficiformis* (Mediterranean Sea). Pharm: Toxic (brine shrimp). Ref: Y. Guo, et al, JNP, 1995, 58, 712

**172 (3R,4E,14E)-14-Methyl-4-docosen-1-yn-3-ol**

Type: Acetylenic alcohols.  $C_{23}H_{42}O$   $[\alpha]_D = +1.8^\circ$  ( $c = 2.5$ , MeOH). Source: Sponge *Cribrochalina vasculum* (Bahamas). Pharm: Toxic (brine shrimp). Ref: A. Aiello, et al, JNP, 1992, 55, 1275

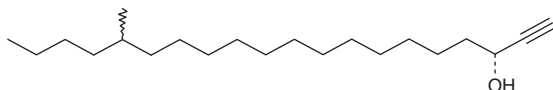
**173 (R)-19-Methyl-1-eicosyn-3-ol**

Type: Acetylenic alcohols.  $C_{23}H_{42}O$   $[\alpha]_D = +1.9^\circ$  ( $c = 2$ , MeOH). Source: Sponge *Cribrochalina vasculum* (Bahamas). Pharm: Toxic (brine shrimp). Ref: A. Aiello, et al, JNP, 1992, 55, 1275



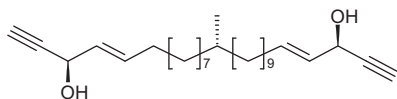
#### 174 (3R,16ξ)-16-Methyl-1-eicosyn-3-ol

**Type:** Acetylenic alcohols.  $C_{23}H_{42}O$   $[\alpha]_D = +2.1^\circ$  ( $c = 1.7$ , MeOH). **Source:** Sponge *Cribrochalina vasculum* (Bahamas). **Pharm:** Toxic (brine shrimp). **Ref:** A. Aiello, et al, JNP, 1992, 55, 1275



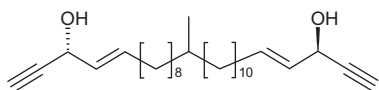
#### 175 Miyakosyne A

**Type:** Acetylenic alcohols.  $C_{29}H_{48}O_2$  Colorless solid,  $[\alpha]_D^{24} = -28^\circ$  ( $c = 0.42$ , MeOH). **Source:** Sponge *Petrosia* sp. **Pharm:** Cytotoxic (HeLa,  $IC_{50} = 0.10 \mu\text{g/mL}$ ). **Ref:** Y. Hitora, et al, Tetrahedron, 2011, 67, 4530 | Y. Hitora, et al, Tetrahedron, 2013, 69, 11070



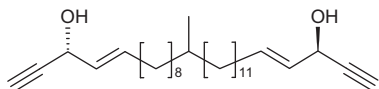
#### 176 Miyakosyne B

**Type:** Acetylenic alcohols.  $C_{30}H_{50}O_2$  Colorless solid,  $[\alpha]_D^{26} = -27^\circ$  ( $c = 0.60$ , MeOH). **Source:** Sponge *Petrosia* sp. **Pharm:** Cytotoxic (HeLa,  $IC_{50} = 0.13 \mu\text{g/mL}$ ). **Ref:** Y. Hitora, et al, Tetrahedron, 2011, 67, 4530



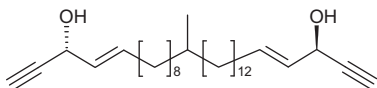
#### 177 Miyakosyne C

**Type:** Acetylenic alcohols.  $C_{31}H_{52}O_2$  Colorless solid,  $[\alpha]_D^{24} = -28^\circ$  ( $c = 0.72$ , MeOH). **Source:** Sponge *Petrosia* sp. **Pharm:** Cytotoxic (HeLa,  $IC_{50} = 0.04 \mu\text{g/mL}$ ). **Ref:** Y. Hitora, et al, Tetrahedron, 2011, 67, 4530

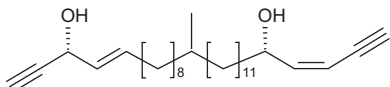


**178 Miyakosyne D**

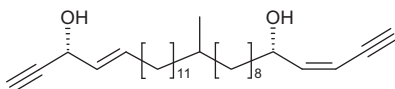
**Type:** Acetylenic alcohols.  $C_{32}H_{54}O_2$  Colorless solid,  $[\alpha]_D^{26} = -25^\circ$  ( $c = 0.35$ , MeOH).  
**Source:** Sponge *Petrosia* sp. **Pharm:** Cytotoxic (HeLa,  $IC_{50} = 0.15$   $\mu\text{g/mL}$ ). **Ref:** Y. Hitora, et al, Tetrahedron, 2011, 67, 4530

**179 Miyakosyne E**

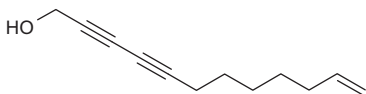
**Type:** Acetylenic alcohols.  $C_{31}H_{52}O_2$  Colorless solid,  $[\alpha]_D^{25} = -34^\circ$  ( $c = 0.32$ , MeOH).  
**Source:** Sponge *Petrosia* sp. **Pharm:** Cytotoxic (mixture with Miyakosyne F, HeLa,  $IC_{50} = 0.30$   $\mu\text{g/mL}$ ). **Ref:** Y. Hitora, et al, Tetrahedron, 2011, 67, 4530

**180 Miyakosyne F**

**Type:** Acetylenic alcohols.  $C_{31}H_{52}O_2$  Colorless solid,  $[\alpha]_D^{25} = -34^\circ$  ( $c = 0.32$ , MeOH).  
**Source:** Sponge *Petrosia* sp. **Pharm:** Cytotoxic (mixture with Miyakosyne E, HeLa,  $IC_{50} = 0.30$   $\mu\text{g/mL}$ ). **Ref:** Y. Hitora, et al, Tetrahedron, 2011, 67, 4530

**181 Montiporyne G**

**Type:** Acetylenic alcohols.  $C_{12}H_{16}O$  Light yellow oil. **Source:** Stony coral *Montipora* sp. **Pharm:** Cytotoxic (A549,  $ED_{50} = 13.78$   $\mu\text{g/mL}$ ; SK-OV-3,  $ED_{50} = 9.79$   $\mu\text{g/mL}$ ; SK-MEL-2,  $ED_{50} = 9.56$   $\mu\text{g/mL}$ ; XF498,  $ED_{50} = 10.78$   $\mu\text{g/mL}$ ; HCT15,  $ED_{50} = 12.93$   $\mu\text{g/mL}$ ; control Cisplatin: A549,  $ED_{50} = 0.75$   $\mu\text{g/mL}$ ; SK-OV-3,  $ED_{50} = 1.09$   $\mu\text{g/mL}$ ; SK-MEL-2,  $ED_{50} = 2.18$   $\mu\text{g/mL}$ ; XF498,  $ED_{50} = 1.18$   $\mu\text{g/mL}$ ; HCT15,  $ED_{50} = 0.85$   $\mu\text{g/mL}$ ). **Ref:** N. Alam, et al, JNP, 2001, 64, 1059

**182 Montiporyne H**

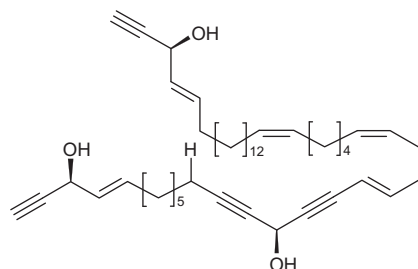
2-(11-Dodecene-2,4-diynyloxy)ethanol **Type:** Acetylenic alcohols.  $C_{14}H_{20}O_2$  Yellow oil. **Source:** Stony coral *Montipora* sp. **Pharm:** Cytotoxic (A549,  $ED_{50} = 22.73$   $\mu\text{g/mL}$ ; SK-OV-3,  $ED_{50} = 17.94$   $\mu\text{g/mL}$ ; SK-MEL-2,  $ED_{50} = 25.08$   $\mu\text{g/mL}$ ; XF498,  $ED_{50} = 16.88$   $\mu\text{g/mL}$ ;

HCT15,  $ED_{50} = 24.05 \mu\text{g/mL}$ ; control Cisplatin: A549,  $ED_{50} = 0.75 \mu\text{g/mL}$ ; SK-OV-3,  $ED_{50} = 1.09 \mu\text{g/mL}$ ; SK-MEL-2,  $ED_{50} = 2.18 \mu\text{g/mL}$ ; XF498,  $ED_{50} = 1.18 \mu\text{g/mL}$ ; HCT15,  $ED_{50} = 0.85 \mu\text{g/mL}$ ). Ref.: N. Alam, et al, JNP, 2001, 64, 1059



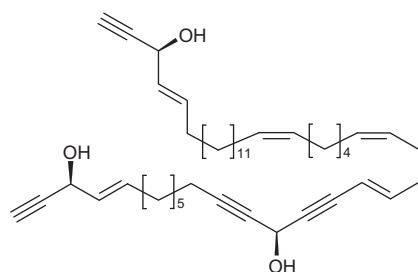
### 183 Neopetroformyne A

4,17,21,27,42-Hexametracontapentaene-1,12,15,45-tetrayne-3,14,44-triol Type: Acetylenic alcohols.  $C_{46}H_{68}O_3$  Yellowish oil,  $[\alpha]_D^{20} = +19^\circ$  ( $c = 0.45$ , MeOH). Source: Sponge *Petrosia* sp. (depth of 150 m, Kurose Hole, Hachijo I., South Korea). Pharm.: Cytotoxic ( $P_{388}$ ,  $IC_{50} = 0.089 \mu\text{g/mL}$ ). Ref.: R. Ueoka, et al, Tetrahedron, 2009, 65, 5204



### 184 Neopetroformyne B

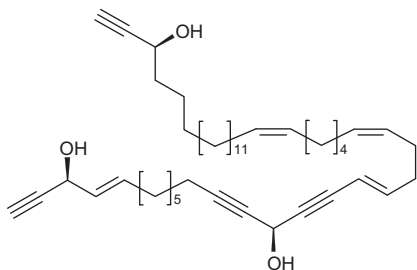
Type: Acetylenic alcohols.  $C_{45}H_{66}O_3$  Yellowish oil,  $[\alpha]_D^{20} = +21^\circ$  ( $c = 0.06$ , MeOH). Source: Sponge *Petrosia* sp. (depth of 150 m, Kurose Hole, Hachijo I., South Korea). Pharm.: Cytotoxic ( $P_{388}$ ,  $IC_{50} = 0.2 \mu\text{g/mL}$ ). Ref.: R. Ueoka, et al, Tetrahedron, 2009, 65, 5204



### 185 Neopetroformyne C

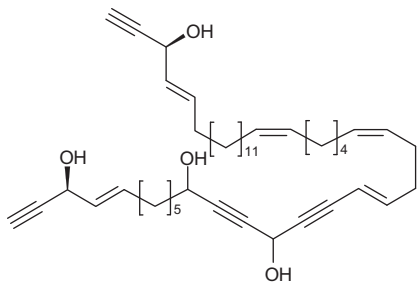
Type: Acetylenic alcohols.  $C_{45}H_{68}O_3$  Oil,  $[\alpha]_D^{22} = -15^\circ$  ( $c = 0.01$ , MeOH). Source: Sponge *Petrosia* sp. (depth of 150 m, Kurose Hole, Hachijo I., South Korea).

**Pharm:** Cytotoxic ( $P_{388}$ ,  $IC_{50} = 0.45 \mu\text{g/mL}$ ). **Ref:** R. Ueoka, et al, *Tetrahedron*, 2009, 65, 5204



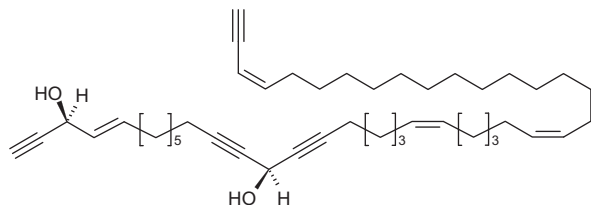
### 186 Neopetroformyne D

**Type:** Acetylenic alcohols.  $C_{45}H_{66}O_4$  Oil,  $[\alpha]_D^{21} = +20^\circ$  ( $c = 0.01$ , MeOH). **Source:** Sponge *Petrosia* sp. (depth of 150 m, Kurose Hole, Hachijo I., South Korea). **Pharm:** Cytotoxic ( $P_{388}$ ,  $IC_{50} = 0.45 \mu\text{g/mL}$ ). **Ref:** R. Ueoka, et al, *Tetrahedron*, 2009, 65, 5204



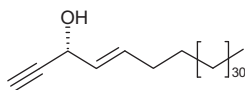
### 187 Nor-(3S,14S)-petrocortyne A

**Type:** Acetylenic alcohols.  $C_{46}H_{68}O_2$  Yellow oil,  $[\alpha]_D^{23} = +10^\circ$  ( $c = 1$ , MeOH). **Source:** Sponge *Petrosia* sp. (Korea waters). **Pharm:** DNA replication inhibitor (simian virus SV40, 125  $\mu\text{mol/L}$ , InRt = 12%, 250  $\mu\text{mol/L}$ , InRt = 47%, 500  $\mu\text{mol/L}$ , InRt = 70%); cytotoxic (A549,  $ED_{50} = 7.3 \mu\text{g/mL}$ ; SK-OV-3,  $ED_{50} = 4.4 \mu\text{g/mL}$ ; SK-MEL-2,  $ED_{50} = 3.8 \mu\text{g/mL}$ ; XF498,  $ED_{50} = 6.1 \mu\text{g/mL}$ ; HCT15,  $ED_{50} = 3.5 \mu\text{g/mL}$ ; control Cisplatin, A549,  $ED_{50} = 0.4 \mu\text{g/mL}$ ; SK-OV-3,  $ED_{50} = 0.6 \mu\text{g/mL}$ ; SK-MEL-2,  $ED_{50} = 0.9 \mu\text{g/mL}$ ; XF498,  $ED_{50} = 0.2 \mu\text{g/mL}$ ; HCT15,  $ED_{50} = 1.8 \mu\text{g/mL}$ ). **Ref:** J. S. Kim, et al, *JNP*, 1999, 62, 554 | Y. J. Lim, et al, *JNP*, 1999, 62, 1215 | Y. J. Lim, et al, *JNP*, 2001, 64, 46



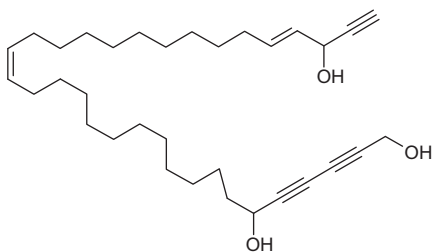
### 188 (3*R*,4*E*)-4-Octatriaconten-1-yn-3-ol

**Type:** Acetylenic alcohols.  $C_{38}H_{72}O$   $[\alpha]_D = -21.2^\circ$  ( $c = 1.2$ , MeOH). **Source:** Sponge *Reniochalina* sp. (Chuuk State, Federated States of Micronesia). **Pharm:** Cytotoxic (ACHN,  $GI_{50} = 0.156$   $\mu\text{g/mL}$ , control Adriamycin,  $GI_{50} = 0.198$   $\mu\text{g/mL}$ ; NCI-H23,  $GI_{50} = 0.117$   $\mu\text{g/mL}$ , Adriamycin,  $GI_{50} = 0.248$   $\mu\text{g/mL}$ ; MDA-MB-231,  $GI_{50} = 0.386$   $\mu\text{g/mL}$ , Adriamycin,  $GI_{50} = 0.278$   $\mu\text{g/mL}$ ; HCT15,  $GI_{50} = 0.345$   $\mu\text{g/mL}$ , Adriamycin,  $GI_{50} = 0.708$   $\mu\text{g/mL}$ ; NUGC-3,  $GI_{50} = 1.493$   $\mu\text{g/mL}$ , Adriamycin,  $GI_{50} = 0.198$   $\mu\text{g/mL}$ ; PC3,  $GI_{50} = 0.732$   $\mu\text{g/mL}$ , Adriamycin,  $GI_{50} = 0.488$   $\mu\text{g/mL}$ ). **Ref:** H. -S. Lee, et al, *Lipids*, 2009, 44, 71



### 189 Pellynol A

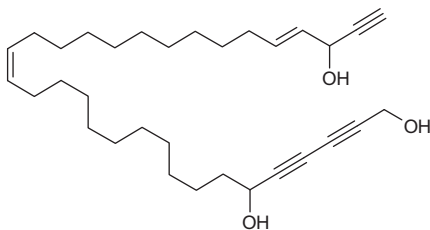
**Type:** Acetylenic alcohols.  $C_{33}H_{52}O_3$   $[\alpha]_D = -8.5^\circ$  ( $c = 1.0$ ,  $\text{CHCl}_3$ ). **Source:** Sponges *Pellina triangulate* (Chuuk Atoll, Federated States of Micronesia) and *Pellina* sp. (South Africa). **Pharm:** Cytotoxic (LOX,  $IC_{50} = 0.39$   $\mu\text{g/mL}$ ; OVCAR-3,  $C_{50} = 2.23$   $\mu\text{g/mL}$ ). **Ref:** X. Fu, et al, *Tetrahedron*, 1997, 53, 799 | M. A. Rashid, et al, *Nat. Prod. Lett.*, 2000, 14, 387



### 190 Pellynol B

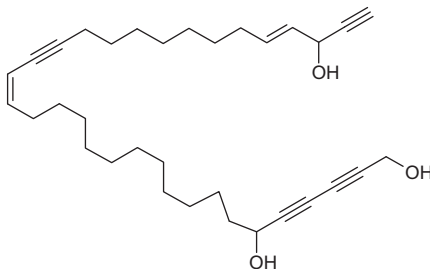
**Type:** Acetylenic alcohols.  $C_{32}H_{50}O_3$   $[\alpha]_D = -7.6^\circ$  ( $c = 0.28$ ,  $\text{CHCl}_3$ ). **Source:** Sponges *Pellina triangulate* (Chuuk Atoll, Federated States of Micronesia) and *Pellina* sp. (South Africa). **Pharm:** Cytotoxic (LOX,  $IC_{50} = 0.15$   $\mu\text{g/mL}$ ; OVCAR-3,  $C_{50} = 1.54$   $\mu\text{g/mL}$ ). **Ref:** X. Fu, et al, *Tetrahedron*, 1997, 53, 799 | M. A. Rashid, et al, *Nat. Prod. Lett.*, 2000, 14, 387





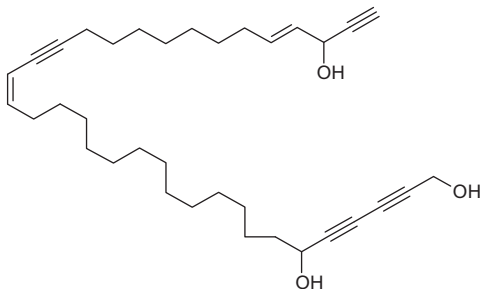
### 191 Pellynol C

**Type:** Acetylenic alcohols.  $C_{33}H_{48}O_3$   $[\alpha]_D = -11.2^\circ$  ( $c = 2.38$ ,  $CHCl_3$ ). **Source:** Sponges *Pellina triangulate* (Chuuk Atoll, Federated States of Micronesia) and *Pellina* sp. (South Africa). **Pharm:** Cytotoxic (LOX,  $IC_{50} = 0.14 \mu\text{g/mL}$ ; OVCAR-3,  $C_{50} = 1.0 \mu\text{g/mL}$ ). **Ref:** X. Fu, et al, Tetrahedron, 1997, 53, 799 | M. A. Rashid, et al, Nat. Prod. Lett., 2000, 14, 387



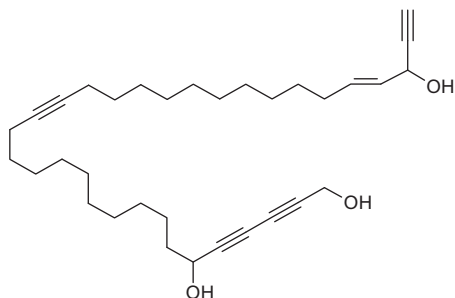
### 192 Pellynol D

**Type:** Acetylenic alcohols.  $C_{35}H_{52}O_3$   $[\alpha]_D = -9.8^\circ$  ( $c = 0.64$ , MeOH). **Source:** Sponges *Pellina triangulate* (Chuuk Atoll, Federated States of Micronesia) and *Pellina* sp. (South Africa). **Pharm:** Cytotoxic (LOX,  $IC_{50} = 0.12 \mu\text{g/mL}$ ; OVCAR-3,  $C_{50} = 1.75 \mu\text{g/mL}$ ). **Ref:** X. Fu, et al, Tetrahedron, 1997, 53, 799 | M. A. Rashid, et al, Nat. Prod. Lett., 2000, 14, 387

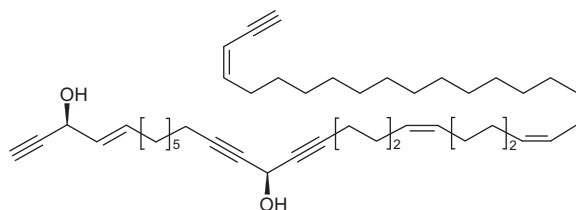


**193 Pellynol F**

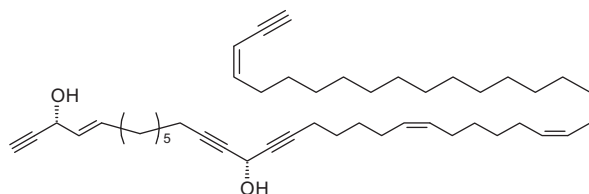
**Type:** Acetylenic alcohols.  $C_{33}H_{50}O_3$  **Source:** Sponge *Pellina* sp. (South Africa), Lithistid sponge *Theonella* sp. (Chuuk Atoll, Federated States of Micronesia). **Pharm:** Cytotoxic (LOX,  $IC_{50} = 0.08 \mu\text{g/mL}$ ; OVCAR-3,  $C_{50} = 1.7 \mu\text{g/mL}$ ). **Ref:** X. Fu, et al, JNP, 1999, 62, 1336 | M. A. Rashid, et al, Nat. Prod. Lett., 2000, 14, 387

**194 (3S,14S)-Petrocortyne A**

**Type:** Acetylenic alcohols.  $C_{46}H_{70}O_2$  Yellow oil,  $[\alpha]_D^{23} = +10.8^\circ$  ( $c = 1.9$ , MeOH). **Source:** Sponge *Petrosia* sp. (Korea waters). **Pharm:** Cytotoxic (A549,  $ED_{50} = 1.1 \mu\text{g/mL}$ , SK-OV-3,  $ED_{50} = 0.6 \mu\text{g/mL}$ , SK-MEL-2,  $ED_{50} = 1.1 \mu\text{g/mL}$ , XF498,  $ED_{50} = 1.7 \mu\text{g/mL}$ , HCT15,  $ED_{50} = 1.0 \mu\text{g/mL}$ ). **Ref:** J. S. Kim, et al, JNP, 1999, 62, 554 | Y. J. Lim, et al, JNP, 1999, 62, 1215

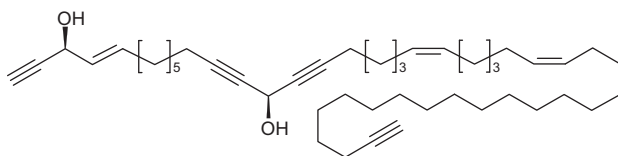
**195 Petrocortyne A**

**Type:** Acetylenic alcohols.  $C_{46}H_{70}O_2$   $[\alpha]_D^{25} = +6.4^\circ$  ( $c = 0.25$ , MeOH). **Source:** Sponge *Petrosia* sp. (Korea waters). **Pharm:** RNA-cleaving activity; PLA<sub>2</sub> inhibitor; Na/K-ATPase inhibitor; toxin (brine shrimp, significant lethality). **Ref:** Y. Seo, et al, Tetrahedron, 1998, 54, 447 | J. Shin, et al, JNP, 1998, 61, 1268

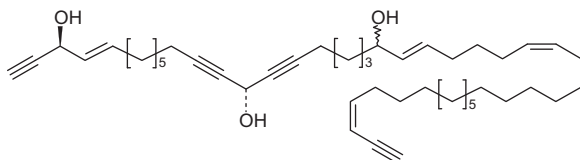


**196 (3S,14S)-Petrocortyne B**

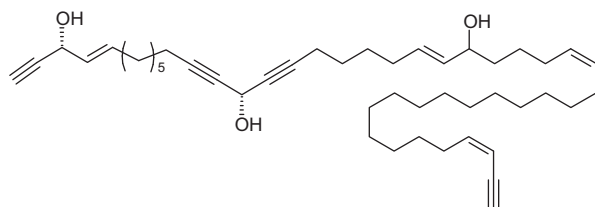
**Type:** Acetylenic alcohols.  $C_{46}H_{72}O_2$  Yellow oil,  $[\alpha]_D^{23} = +2^\circ$  ( $c = 0.26$ , MeOH). **Source:** Sponge *Petrosia* sp. (Korea waters). **Pharm:** DNA replication inhibitor (simian virus SV40, 125  $\mu\text{mol/L}$ , InRt = 40%, 250  $\mu\text{mol/L}$ , InRt = 70%, 500  $\mu\text{mol/L}$ , InRt = 100%); cytotoxic (A549,  $ED_{50} > 10 \mu\text{g/mL}$ ; SK-OV-3,  $ED_{50} = 1.5 \mu\text{g/mL}$ ; SK-MEL-2,  $ED_{50} = 1.5 \mu\text{g/mL}$ ; XF498,  $ED_{50} = 5.8 \mu\text{g/mL}$ ; HCT15,  $ED_{50} = 2.5 \mu\text{g/mL}$ ; control Cisplatin, A549,  $ED_{50} = 0.8 \mu\text{g/mL}$ ; SK-OV-3,  $ED_{50} = 1.2 \mu\text{g/mL}$ ; SK-MEL-2,  $ED_{50} = 1.5 \mu\text{g/mL}$ ; XF498,  $ED_{50} = 0.7 \mu\text{g/mL}$ ; HCT15,  $ED_{50} = 1.5 \mu\text{g/mL}$ ). **Ref:** Y. J. Lim, et al, JNP, 2001, 64, 46

**197 (3S,14R)-Petrocortyne E**

(3S,4E,14R,21 $\xi$ ,22E,27Z,43Z)-4,22,27,43-Hexatetracontatetraene-1,12,15,45-tetraene-3,14,21-triol **Type:** Acetylenic alcohols.  $C_{46}H_{70}O_3$  Gum,  $[\alpha]_D^{25} = +3^\circ$  ( $c = 0.15$ , MeOH). **Source:** Sponge *Petrosia* sp. (Korea waters). **Pharm:** DNA replication inhibitor (simian virus SV40, 125  $\mu\text{mol/L}$ , InRt = 79%, 250  $\mu\text{mol/L}$ , InRt = 94%, 500  $\mu\text{mol/L}$ , InRt = 100%); cytotoxic (A549,  $ED_{50} = 26.3 \mu\text{g/mL}$ ; SK-OV-3,  $ED_{50} = 1.9 \mu\text{g/mL}$ ; SK-MEL-2,  $ED_{50} = 2.3 \mu\text{g/mL}$ ; XF498,  $ED_{50} = 8.0 \mu\text{g/mL}$ ; HCT15,  $ED_{50} = 5.0 \mu\text{g/mL}$ ; control Cisplatin, A549,  $ED_{50} = 0.9 \mu\text{g/mL}$ ; SK-OV-3,  $ED_{50} = 1.6 \mu\text{g/mL}$ ; SK-MEL-2,  $ED_{50} = 1.0 \mu\text{g/mL}$ ; XF498,  $ED_{50} = 0.9 \mu\text{g/mL}$ ; HCT15,  $ED_{50} = 1.9 \mu\text{g/mL}$ ). **Ref:** Y. J. Lim, et al, JNP, 2001, 64, 46 | B. Sui, et al, JOC, 2010, 75, 2942

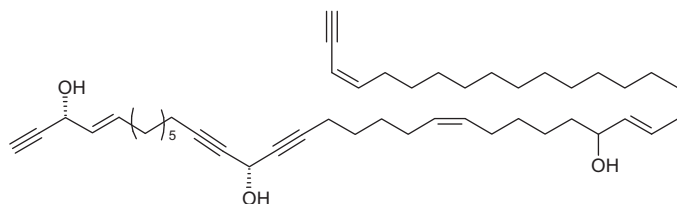
**198 Petrocortyne F**

**Type:** Acetylenic alcohols.  $C_{46}H_{70}O_3$  Gum,  $[\alpha]_D^{25} = +8.5^\circ$  ( $c = 0.03$ , MeOH). **Source:** Sponge *Petrosia* sp. (Korea waters). **Pharm:** Cytotoxic (A549,  $ED_{50} = 10.0 \mu\text{g/mL}$ ; SK-OV-3,  $ED_{50} = 1.8 \mu\text{g/mL}$ ; SK-MEL-2,  $ED_{50} = 1.3 \mu\text{g/mL}$ ; XF498,  $ED_{50} = 4.7 \mu\text{g/mL}$ ; HCT15,  $ED_{50} = 4.0 \mu\text{g/mL}$ ; control Cisplatin: A549,  $ED_{50} = 0.7 \mu\text{g/mL}$ ; SK-OV-3,  $ED_{50} = 1.3 \mu\text{g/mL}$ ; SK-MEL-2,  $ED_{50} = 1.0 \mu\text{g/mL}$ ; XF498,  $ED_{50} = 0.7 \mu\text{g/mL}$ ; HCT15,  $ED_{50} = 1.1 \mu\text{g/mL}$ ); DNA replication inhibitor (SV40 DNA replication, 20  $\mu\text{mol/L}$ , InRt = 9%; 40  $\mu\text{mol/L}$ , InRt = 36%). **Ref:** Y. J. Lim, et al, JNP, 2001, 64, 1565



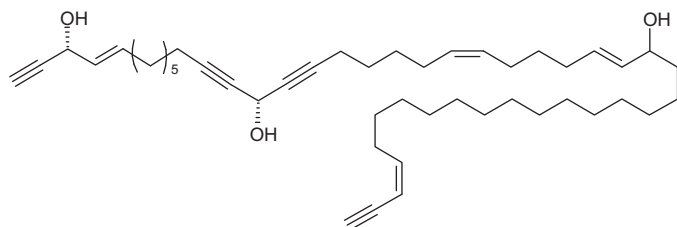
### 199 Petrocortyne G

**Type:** Acetylenic alcohols.  $C_{46}H_{70}O_3$  Gum,  $[\alpha]_D^{25} = +8.3^\circ$  ( $c = 0.04$ , MeOH). **Source:** Sponge *Petrosia* sp. (Korea waters). **Pharm:** Cytotoxic (A549,  $ED_{50} = 4.0 \mu\text{g/mL}$ ; SK-OV-3,  $ED_{50} = 1.2 \mu\text{g/mL}$ ; SK-MEL-2,  $ED_{50} = 0.5 \mu\text{g/mL}$ ; XF498,  $ED_{50} = 3.5 \mu\text{g/mL}$ ; HCT15,  $ED_{50} = 1.4 \mu\text{g/mL}$ ; control Cisplatin: A549,  $ED_{50} = 0.7 \mu\text{g/mL}$ ; SK-OV-3,  $ED_{50} = 1.3 \mu\text{g/mL}$ ; SK-MEL-2,  $ED_{50} = 1.0 \mu\text{g/mL}$ ; XF498,  $ED_{50} = 0.7 \mu\text{g/mL}$ ; HCT15,  $ED_{50} = 1.1 \mu\text{g/mL}$ ); DNA replication inhibitor (SV40 DNA replication,  $20 \mu\text{mol/L}$ , InRt = 8%;  $40 \mu\text{mol/L}$ , InRt = 55%). **Ref:** Y. J. Lim, et al, JNP, 2001, 64, 1565



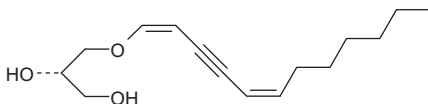
### 200 Petrocortyne H

**Type:** Acetylenic alcohols.  $C_{46}H_{70}O_3$  Gum,  $[\alpha]_D^{25} = +4.4^\circ$  ( $c = 0.07$ , MeOH). **Source:** Sponge *Petrosia* sp. (Korea waters). **Pharm:** Cytotoxic (A549,  $ED_{50} = 4.0 \mu\text{g/mL}$ ; SK-OV-3,  $ED_{50} = 1.2 \mu\text{g/mL}$ ; SK-MEL-2,  $ED_{50} = 0.5 \mu\text{g/mL}$ ; XF498,  $ED_{50} = 3.5 \mu\text{g/mL}$ ; HCT15,  $ED_{50} = 1.4 \mu\text{g/mL}$ ; control Cisplatin: A549,  $ED_{50} = 0.7 \mu\text{g/mL}$ ; SK-OV-3,  $ED_{50} = 1.3 \mu\text{g/mL}$ ; SK-MEL-2,  $ED_{50} = 1.0 \mu\text{g/mL}$ ; XF498,  $ED_{50} = 0.7 \mu\text{g/mL}$ ; HCT15,  $ED_{50} = 1.1 \mu\text{g/mL}$ ); DNA replication inhibitor (SV40 DNA replication,  $20 \mu\text{mol/L}$ , InRt = 8%;  $40 \mu\text{mol/L}$ , InRt = 55%). **Ref:** Y. J. Lim, et al, JNP, 2001, 64, 1565

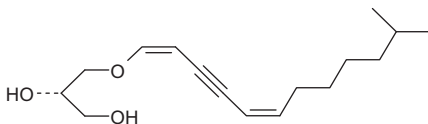


**201 Petroraspailyne A<sub>1</sub>**

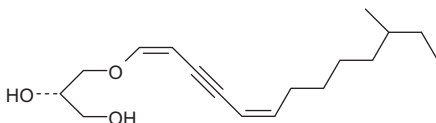
Type: Acetylenic alcohols.  $C_{15}H_{24}O_3$   $[\alpha]_D^{25} = -3.2^\circ$  ( $c = 0.08$ , MeOH). Source: Sponge *Petrosia* sp. (Korea waters). Pharm: Cytotoxic (K562,  $LC_{50} = 9.2 \mu\text{g/mL}$ ). Ref: Y. Seo, et al, JNP, 1999, 62, 122

**202 Petroraspailyne A<sub>2</sub>**

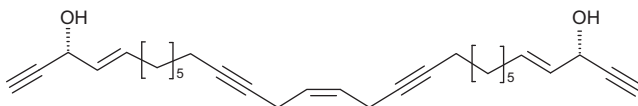
Type: Acetylenic alcohols.  $C_{16}H_{26}O_3$   $[\alpha]_D^{25} = -3.2^\circ$  ( $c = 0.40$ , MeOH). Source: Sponge *Petrosia* sp. (Korea waters). Pharm: Cytotoxic (K562,  $LC_{50} = 57 \mu\text{g/mL}$ ). Ref: Y. Seo, et al, JNP, 1999, 62, 122

**203 Petroraspailyne A<sub>3</sub>**

Type: Acetylenic alcohols.  $C_{17}H_{28}O_3$   $[\alpha]_D^{25} = +2.6^\circ$  ( $c = 0.05$ , MeOH). Source: Sponge *Petrosia* sp. (Korea waters). Pharm: Cytotoxic (K562,  $LC_{50} = 29 \mu\text{g/mL}$ ). Ref: Y. Seo, et al, JNP, 1999, 62, 122

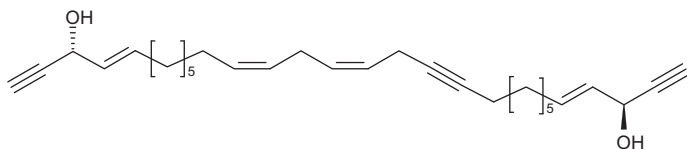
**204 Petrosiacetylene A**

Dideoxypetrosynol A Type: Acetylenic alcohols.  $C_{30}H_{40}O_2$   $[\alpha]_D^{25} = 0^\circ$  ( $c = 0.63$ , MeOH). Source: Sponge *Petrosia* sp. (Korea waters). Pharm: RNA-cleaving activity;  $PLA_2$  inhibitor; Na/K-ATPase inhibitor; cytotoxic (hmn: A549, SK-OV-3, SK-MEL-2, XF498, HCT15); toxin (brine shrimp, significant lethality). Ref: Y. Seo, et al, Tetrahedron, 1998, 54, 447 | J. S. Kim, et al, Tetrahedron, 1999, 55, 2113

**205 Petrosiacetylene B**

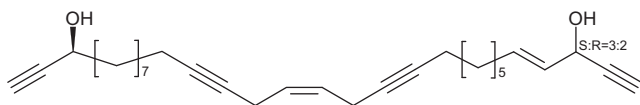
Dideoxypetrosynol C Type: Acetylenic alcohols.  $C_{30}H_{42}O_2$   $[\alpha]_D^{25} = 0.3^\circ$  ( $c = 0.49$ , MeOH). Source: Sponge *Petrosia* sp. (Korea waters). Pharm: RNA-cleaving activity;

PLA<sub>2</sub> inhibitor; Na/K-ATPase inhibitor; cytotoxic (hmn: A549, SK-OV-3, SK-MEL-2, XF498, HCT15); toxin (brine shrimp, significant lethality). Ref: Y. Seo, et al, Tetrahedron, 1998, 54, 447 | J.S. Kim, et al, Tetrahedron, 1999, 55, 2113



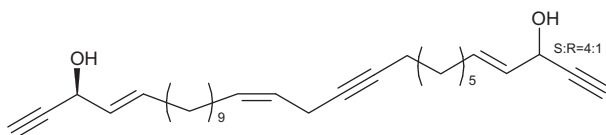
### 206 Petrosiacetylene C

Dideoxypetrosynol B Type: Acetylenic alcohols. C<sub>30</sub>H<sub>42</sub>O<sub>2</sub> [ $\alpha$ ]<sub>D</sub><sup>25</sup> = 0.2° (c = 0.15, MeOH). Source: Sponge *Petrosia* sp. (Korea waters). Pharm: RNA-cleaving activity; PLA<sub>2</sub> inhibitor; Na/K-ATPase inhibitor; cytotoxic (hmn: A549, SK-OV-3, SK-MEL-2, XF498, HCT15); toxin (brine shrimp, significant lethality). Ref: Y. Seo, et al, Tetrahedron, 1998, 54, 447 | J.S. Kim, et al, Tetrahedron, 1999, 55, 2113



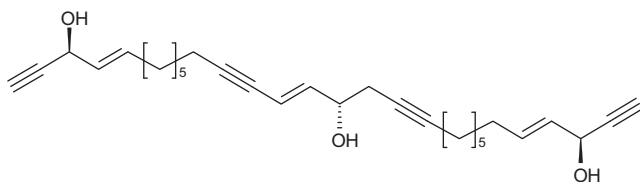
### 207 Petrosiacetylene D

Type: Acetylenic alcohols. C<sub>30</sub>H<sub>44</sub>O<sub>2</sub> [ $\alpha$ ]<sub>D</sub><sup>25</sup> = +5.2° (c = 0.27, MeOH). Source: Sponge *Petrosia* sp. (Korea waters). Pharm: RNA-cleaving activity; PLA<sub>2</sub> inhibitor; Na/K-ATPase inhibitor; toxic (lethality to brine shrimp). Ref: Y. Seo, et al, Tetrahedron, 1998, 54, 447



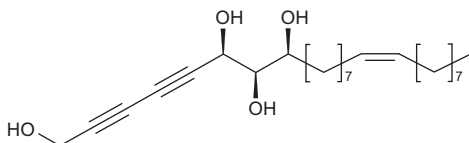
### 208 Petrosiacetylene E

Type: Acetylenic alcohols. C<sub>30</sub>H<sub>40</sub>O<sub>3</sub> Source: Sponge *Petrosia* sp. (Dokdo I., South Korea). Pharm: Cytotoxic (multiple HTCLs, low  $\mu$ mol/L inhibitor). Ref: Y. -J. Lee, et al, Lipids, 2013, 48, 87

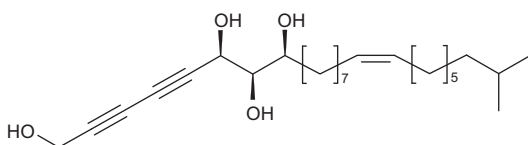


**209 Petrosiol A**

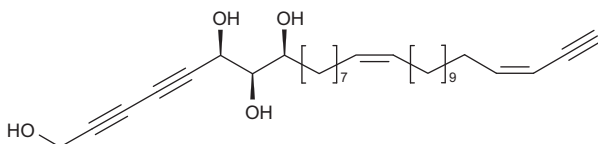
**Type:** Acetylenic alcohols.  $C_{25}H_{42}O_4$  **Source:** Sponge *Petrosia strongylata* (Ishigaki I., Okinawa). **Pharm:** Inducer of nerve growth factor-like (neuronal differentiation in PC12 cells); inhibits proliferation and migration of platelet derived growth factor-induced vascular smooth muscle cells and hence could be used as a lead for vascular disorders. **Ref:** K. Horikawa, et al, Tetrahedron, 2013, 69, 101 | B. -K. Choi, et al, Bioorg. Med. Chem., 2013, 21, 1804

**210 Petrosiol B**

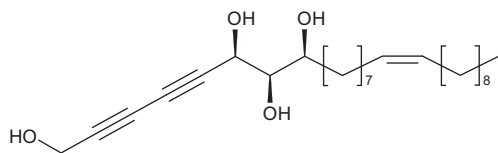
**Type:** Acetylenic alcohols.  $C_{26}H_{44}O_4$  **Source:** Sponge *Petrosia strongylata* (Ishigaki I., Okinawa). **Pharm:** Inducer of nerve growth factor-like (neuronal differentiation in PC12 cells). **Ref:** K. Horikawa, et al, Tetrahedron, 2013, 69, 101

**211 Petrosiol C**

**Type:** Acetylenic alcohols.  $C_{31}H_{48}O_4$  **Source:** Sponge *Petrosia strongylata* (Ishigaki I., Okinawa). **Pharm:** Inducer of nerve growth factor-like (neuronal differentiation in PC12 cells). **Ref:** K. Horikawa, et al, Tetrahedron, 2013, 69, 101

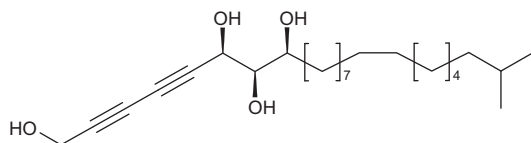
**212 Petrosiol D**

**Type:** Acetylenic alcohols.  $C_{26}H_{44}O_4$  **Source:** Sponge *Petrosia strongylata* (Ishigaki I., Okinawa). **Pharm:** Inducer of nerve growth factor-like (neuronal differentiation in PC12 cells). **Ref:** K. Horikawa, et al, Tetrahedron, 2013, 69, 101 | A. S. Reddy, et al, Tet. Lett., 2013, 54, 6370



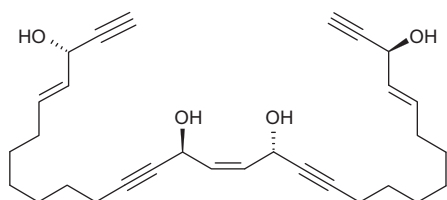
### 213 Petrosiol E

**Type:** Acetylenic alcohols.  $C_{25}H_{44}O_4$  **Source:** Sponge *Petrosia strongylata* (Ishigaki I., Okinawa). **Pharm:** Inducer of nerve growth factor-like (neuronal differentiation in PC12 cells). **Ref:** K. Horikawa, et al, Tetrahedron, 2013, 69, 101



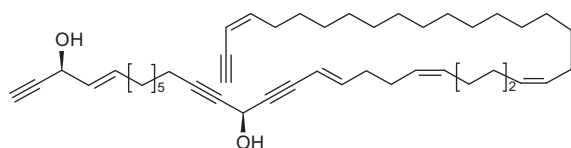
### 214 Petrosynol

4,15,26-Triacontatriene-1,12,18,29-tetraol **Type:** Acetylenic alcohols.  $C_{30}H_{40}O_4$  Oil,  $[\alpha]_D^{23} = +107^\circ$  ( $c = 0.37$ ,  $CHCl_3$ ),  $[\alpha]_D^{22} = +111^\circ$  ( $c = 1.3$ ,  $CHCl_3$ ). **Source:** Sponges *Petrosia* sp. (Okinawa; Red Sea) and *Adocia* sp. **Pharm:** HIV reverse transcriptase inhibitor; antifungal; cell division inhibitor (fertilized eggs of sea urchin *Pseudocentrotus depressus*, 1  $\mu\text{g}/\text{mL}$ ). **Ref:** N. Fusetani, et al, Tet. Lett., 1983, 24, 2771; 1987, 28, 4313 | S. Isaacs, et al, Tetrahedron, 1993, 49, 10435



### 215 Petrotetraandiol A

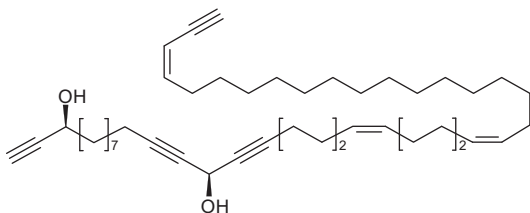
**Type:** Acetylenic alcohols.  $C_{46}H_{68}O_2$  Yellow oil,  $[\alpha]_D^{23} = +7.3^\circ$  ( $c = 0.12$ , MeOH). **Source:** Sponge *Petrosia* sp. (Korea waters). **Pharm:** Cytotoxic (A549,  $ED_{50} = 1.6 \mu\text{g}/\text{mL}$ , SK-OV-3,  $ED_{50} = 0.5 \mu\text{g}/\text{mL}$ , SK-MEL-2,  $ED_{50} = 0.9 \mu\text{g}/\text{mL}$ , XF498,  $ED_{50} = 1.7 \mu\text{g}/\text{mL}$ , HCT15,  $ED_{50} = 1.0 \mu\text{g}/\text{mL}$ ). **Ref:** J. S. Kim, et al, JNP, 1999, 62, 554 | Y. J. Lim, et al, JNP, 1999, 62, 1215



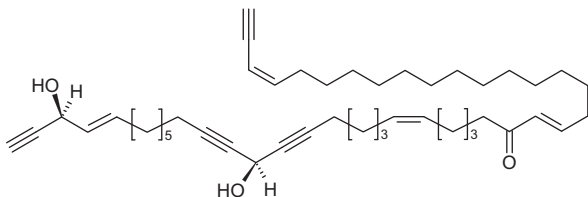


**216 Petrotetrayndiol B**

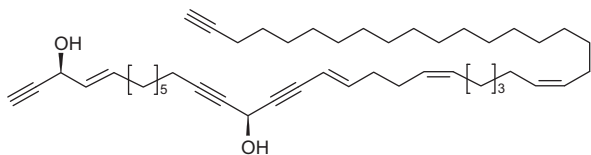
**Type:** Acetylenic alcohols.  $C_{46}H_{72}O_2$  Oil,  $[\alpha]_D^{23} = +3.8^\circ$  ( $c = 0.17$ , MeOH). **Source:** Sponge *Petrosia* sp. (Korea waters). **Pharm:** Cytotoxic (A549,  $ED_{50} = 1.7 \mu\text{g/mL}$ , SK-OV-3,  $ED_{50} = 2.2 \mu\text{g/mL}$ , SK-MEL-2,  $ED_{50} = 1.9 \mu\text{g/mL}$ , XF498,  $ED_{50} > 3.0 \mu\text{g/mL}$ , HCT15,  $ED_{50} = 3.7 \mu\text{g/mL}$ ). **Ref:** J. S. Kim, et al, JNP, 1999, 62, 554 | Y. J. Lim, et al, JNP, 1999, 62, 1215

**217 Petrotetrayndiol C**

**Type:** Acetylenic alcohols.  $C_{46}H_{68}O_3$  Oil. **Source:** Sponge *Petrosia* sp. (Korea waters). **Pharm:** DNA replication inhibitor (simian virus SV40, 125  $\mu\text{mol/L}$ , InRt = 45%, 250  $\mu\text{mol/L}$ , InRt = 46%, 500  $\mu\text{mol/L}$ , InRt = 81%); cytotoxic (A549,  $ED_{50} > 10 \mu\text{g/mL}$ ; SK-OV-3,  $ED_{50} = 4.2 \mu\text{g/mL}$ ; SK-MEL-2,  $ED_{50} = 4.1 \mu\text{g/mL}$ ; XF498,  $ED_{50} = 12.7 \mu\text{g/mL}$ ; HCT15,  $ED_{50} = 5.7 \mu\text{g/mL}$ ; control Cisplatin, A549,  $ED_{50} = 0.4 \mu\text{g/mL}$ ; SK-OV-3,  $ED_{50} = 0.6 \mu\text{g/mL}$ ; SK-MEL-2,  $ED_{50} = 0.9 \mu\text{g/mL}$ ; XF498,  $ED_{50} = 0.2 \mu\text{g/mL}$ ; HCT15,  $ED_{50} = 1.8 \mu\text{g/mL}$ ). **Ref:** J. S. Kim, et al, JNP, 1999, 62, 554 | Y. J. Lim, et al, JNP, 1999, 62, 1215 | Y. J. Lim, et al, JNP, 2001, 64, 46

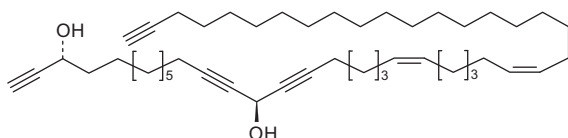
**218 Petrotetrayndiol E**

(3S,4E,14S,17E,21Z,27Z)-4,17,21,27-Hexatetracontatetraene-1,12,15,45-tetraene-3,14-diol  
**Type:** Acetylenic alcohols.  $C_{46}H_{70}O_2$  Oil. **Source:** Sponge *Petrosia* sp. (Korea waters). **Pharm:** DNA replication inhibitor (simian virus SV40, 125  $\mu\text{mol/L}$ , InRt = 62%, 250  $\mu\text{mol/L}$ , InRt = 83%, 500  $\mu\text{mol/L}$ , InRt = 100%); cytotoxic (A549,  $ED_{50} = 24.5 \mu\text{g/mL}$ ; SK-OV-3,  $ED_{50} = 1.7 \mu\text{g/mL}$ ; SK-MEL-2,  $ED_{50} = 1.1 \mu\text{g/mL}$ ; XF498,  $ED_{50} = 3.4 \mu\text{g/mL}$ ; HCT15,  $ED_{50} = 1.8 \mu\text{g/mL}$ ; control Cisplatin, A549,  $ED_{50} = 0.6 \mu\text{g/mL}$ ; SK-OV-3,  $ED_{50} = 0.9 \mu\text{g/mL}$ ; SK-MEL-2,  $ED_{50} = 0.7 \mu\text{g/mL}$ ; XF498,  $ED_{50} = 0.6 \mu\text{g/mL}$ ; HCT15,  $ED_{50} = 0.6 \mu\text{g/mL}$ ). **Ref:** Y. J. Lim, et al, JNP, 2001, 64, 46



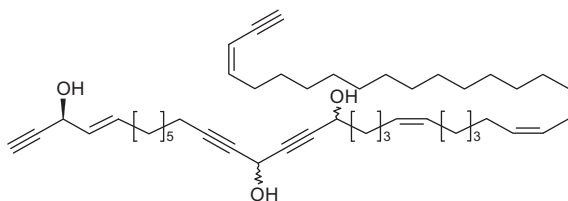
### 219 Petrotetrayndiol F

**Type:** Acetylenic alcohols.  $C_{47}H_{76}O_2$  Yellow oil. **Source:** Sponge *Petrosia* sp. (Korea waters). **Pharm:** Cytotoxic (A549,  $ED_{50} = 3.7 \mu\text{g/mL}$ ; SK-OV-3,  $ED_{50} = 3.8 \mu\text{g/mL}$ ; SK-MEL-2,  $ED_{50} = 1.1 \mu\text{g/mL}$ ; XF498,  $ED_{50} = 4.3 \mu\text{g/mL}$ ; HCT15,  $ED_{50} = 3.4 \mu\text{g/mL}$ ; control Cisplatin: A549,  $ED_{50} = 0.7 \mu\text{g/mL}$ ; SK-OV-3,  $ED_{50} = 1.3 \mu\text{g/mL}$ ; SK-MEL-2,  $ED_{50} = 1.0 \mu\text{g/mL}$ ; XF498,  $ED_{50} = 0.7 \mu\text{g/mL}$ ; HCT15,  $ED_{50} = 1.1 \mu\text{g/mL}$ ); DNA replication inhibitor (SV40 DNA replication,  $20 \mu\text{mol/L}$ , InRt = 16%;  $40 \mu\text{mol/L}$ , InRt = 48%). **Ref:** Y. J. Lim, et al, JNP, 2001, 64, 1565



### 220 Petrotetrayntriol A

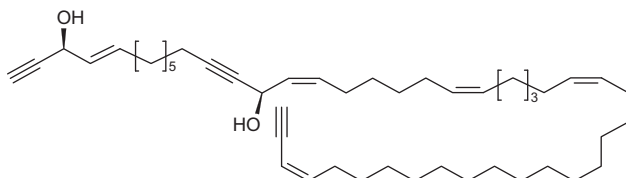
(3S,4E,14ξ,17ξ,21Z,27Z,43Z)-4,21,27,43-Hexatetracontatetraene-1,12,15,45-tetrayne-3,14,17-triol **Type:** Acetylenic alcohols.  $C_{46}H_{70}O_3$  Yellow oil,  $[\alpha]_D^{23} = +7.3^\circ$  ( $c = 0.12$ , MeOH). **Source:** Sponge *Petrosia* sp. (Korea waters). **Pharm:** DNA replication inhibitor (simian virus SV40,  $125 \mu\text{mol/L}$ , InRt = 63%,  $250 \mu\text{mol/L}$ , InRt = 77%,  $500 \mu\text{mol/L}$ , InRt = 100%); cytotoxic (A549,  $ED_{50} > 30 \mu\text{g/mL}$ ; SK-OV-3,  $ED_{50} = 4.2 \mu\text{g/mL}$ ; SK-MEL-2,  $ED_{50} = 3.9 \mu\text{g/mL}$ ; XF498,  $ED_{50} = 18.5 \mu\text{g/mL}$ ; HCT15,  $ED_{50} = 12.9 \mu\text{g/mL}$ ; control Cisplatin, A549,  $ED_{50} = 0.9 \mu\text{g/mL}$ ; SK-OV-3,  $ED_{50} = 1.6 \mu\text{g/mL}$ ; SK-MEL-2,  $ED_{50} = 1.0 \mu\text{g/mL}$ ; XF498,  $ED_{50} = 0.9 \mu\text{g/mL}$ ; HCT15,  $ED_{50} = 1.9 \mu\text{g/mL}$ ). **Ref:** Y. J. Lim, et al, JNP, 2001, 64, 46



### 221 Petrotriyndiol A

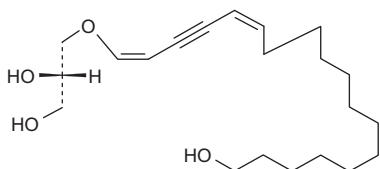
(3S,4E,14R,15Z,21Z,27Z,43Z)-form 4,15,21,27,43-Hexatetracontapentaene-1,12,45-triyn-3,14-diol **Type:** Acetylenic alcohols.  $C_{46}H_{72}O_2$  Yellow oil,  $[\alpha]_D^{23} = +7^\circ$  ( $c = 0.05$ , MeOH). **Source:** Sponge *Petrosia* sp. (Korea waters). **Pharm:** DNA replication inhibitor

(simian virus SV40, 125  $\mu\text{mol/L}$ , InRt = 62%, 250  $\mu\text{mol/L}$ , InRt = 90%, 500  $\mu\text{mol/L}$ , InRt = 100%); cytotoxic (A549,  $\text{ED}_{50}$  = 1.8  $\mu\text{g/mL}$ ; SK-OV-3,  $\text{ED}_{50}$  = 0.8  $\mu\text{g/mL}$ ; SK-MEL-2,  $\text{ED}_{50}$  = 0.6  $\mu\text{g/mL}$ ; XF498,  $\text{ED}_{50}$  = 1.3  $\mu\text{g/mL}$ ; HCT15,  $\text{ED}_{50}$  = 0.8  $\mu\text{g/mL}$ ; control Cisplatin, A549,  $\text{ED}_{50}$  = 0.6  $\mu\text{g/mL}$ ; SK-OV-3,  $\text{ED}_{50}$  = 0.9  $\mu\text{g/mL}$ ; SK-MEL-2,  $\text{ED}_{50}$  = 0.7  $\mu\text{g/mL}$ ; XF498,  $\text{ED}_{50}$  = 0.6  $\mu\text{g/mL}$ ; HCT15,  $\text{ED}_{50}$  = 0.6  $\mu\text{g/mL}$ ). Ref: Y. J. Lim, et al, JNP, 2001, 64, 46



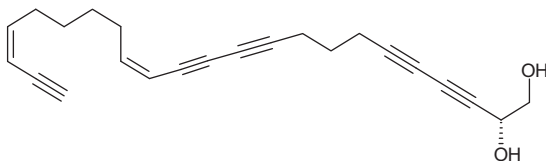
### 222 Raspaillyne A

3-(18-Hydroxy-1,5-octadecadien-3-ynyl)oxy-1,2-propanediol Type: Acetylenic alcohols.  $\text{C}_{21}\text{H}_{36}\text{O}_4$  Amorph. solid (MeOH), mp 54–55  $^{\circ}\text{C}$ ,  $[\alpha]_{\text{D}}^{25}$  = +5.6 $^{\circ}$  ( $c$  = 0.9, MeOH). Source: Sponges *Raspailia pumila* and *Raspailia ramosa*. Pharm: Herbicide. Ref: G. Guella, et al, Chem. Comm., 1986, 77 | Guella, G. et al, Helv. Chim. Acta, 1987, 70, 1050



### 223 Siphonodiol

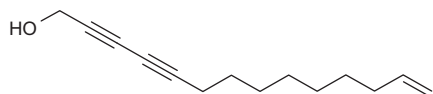
(2R,14Z,20Z)-14,20-Tricosadiene-3,5,10,12,22-pentayne-1,2-diol Type: Acetylenic alcohols.  $\text{C}_{23}\text{H}_{24}\text{O}_2$  Cryst., mp 31–32  $^{\circ}\text{C}$  Source: Sponges *Siphonochalina truncata*. and *Callyspongia* sp. Pharm: Antibacterial; HK-ATPase inhibitor. Ref: N. Fusetani, et al, Tet. Lett., 1987, 28, 4311 | S. Umeyana, et al, JNP, 1997, 60, 131



### 224 13-Tetradecene-2,4-diyn-1-ol

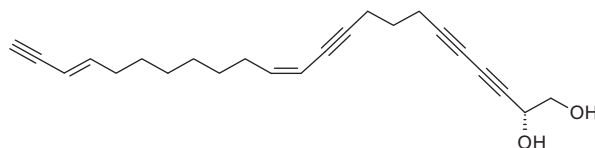
Type: Acetylenic alcohols.  $\text{C}_{14}\text{H}_{20}\text{O}$  Source: Stony corals *Montipora* spp. and *Pectinia lactuca*. Pharm: Cytotoxic (A549,  $\text{ED}_{50}$  = 3.90  $\mu\text{g/mL}$ ; SK-OV-3,  $\text{ED}_{50}$  = 3.23  $\mu\text{g/mL}$ ; SK-MEL-2,  $\text{ED}_{50}$  = 3.94  $\mu\text{g/mL}$ ; XF498,  $\text{ED}_{50}$  = 5.26  $\mu\text{g/mL}$ ; HCT15,  $\text{ED}_{50}$  = 3.32  $\mu\text{g/mL}$ ;

control Cisplatin: A549,  $ED_{50} = 0.75 \mu\text{g/mL}$ ; SK-OV-3,  $ED_{50} = 1.09 \mu\text{g/mL}$ ; SK-MEL-2,  $ED_{50} = 2.18 \mu\text{g/mL}$ ; XF498,  $ED_{50} = 1.18 \mu\text{g/mL}$ ; HCT15,  $ED_{50} = 0.85 \mu\text{g/mL}$ ; ichthyotoxicity; antibacterial (some bacteria); antifungal (some fungi). Ref: T. Higa, et al, Chem. Lett., 1990, 145 | N. Alam, et al, JNP, 2001, 64, 1059



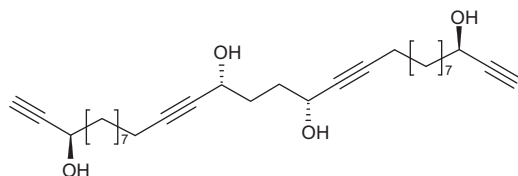
### 225 12,13,14,15-Tetrahydrosiphonodiol

Type: Acetylenic alcohols.  $C_{23}H_{28}O_2$  Source: Sponge *Siphonochalina truncata*. Pharm: HK-ATPase inhibitor. Ref: N. Fusetani, et al, Tet. Lett., 1987, 28, 4311



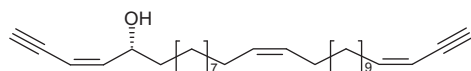
### 226 (all-*R*)-1,12,18,29-Triacontatetrayne-3,14,17,28-tetrol

Type: Acetylenic alcohols.  $C_{30}H_{46}O_4$  Amorph. Solid,  $[\alpha]_D^{22} = +10^\circ$  ( $c = 0.1$ ,  $CHCl_3$ ). Source: Sponge *Petrosia* sp. (Japan waters). Pharm: Cell division inhibitor (fertilized ascidian eggs); toxic (brine shrimp). Ref: M. Ochi, et al, Chem. Lett., 1994, 89



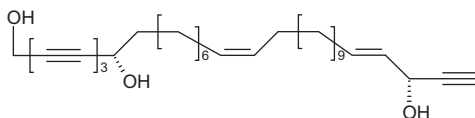
### 227 3*Z*,15*Z*,27*Z*-Triacontatriene-1,29-diyne-5*S*-ol

Type: Acetylenic alcohols.  $C_{30}H_{48}O$  Pale yellow oil,  $[\alpha]_D^{20} = -14^\circ$  ( $c = 0.3$ ,  $CHCl_3$ ). Source: Sponge *Petrosia* sp. (Japan waters). Pharm: Cell division inhibitor (fertilized ascidian eggs); toxic (brine shrimp). Ref: M. Ochi, et al, Chem. Lett., 1994, 89

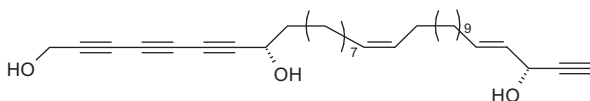


**228 Triangulyne A**

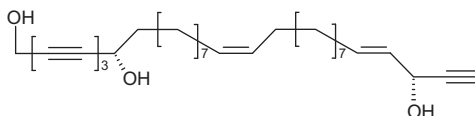
**Type:** Acetylenic alcohols.  $C_{32}H_{46}O_3$  Powder,  $[\alpha]_D = -15^\circ$  ( $c = 1.6$ ,  $CHCl_3$ ). **Source:** Sponge *Pellina triangulata* (Truk, Federated States of Micronesia). **Pharm:** Cytotoxic (NCI hmn tumor cell line panel, leukemia, colon, and melanoma tumor lines showed greater sensitivity; mean panel  $GI_{50} = 0.5 \mu\text{mol/L}$ ,  $TGI = 2.0 \mu\text{mol/L}$ , and  $LC_{50} = 12 \mu\text{mol/L}$ ; for detail data, see Dai, 1996). **Ref:** J. -R. Dai, et al, JNP, 1996, 59, 860

**229 Triangulyne B**

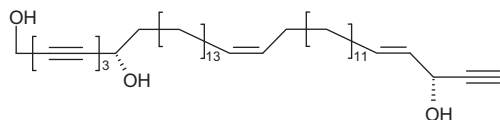
**Type:** Acetylenic alcohols.  $C_{33}H_{48}O_3$  Powder,  $[\alpha]_D = -14^\circ$  ( $c = 0.8$ ,  $CHCl_3$ ). **Source:** Sponge *Pellina triangulata* (Truk, Federated States of Micronesia). **Pharm:** Cytotoxic (NCI hmn tumor cell line panel, leukemia, colon, and melanoma tumor lines showed greater sensitivity). **Ref:** J. -R. Dai, et al, JNP, 1996, 59, 860

**230 Triangulyne C**

**Type:** Acetylenic alcohols.  $C_{31}H_{44}O_3$  Powder,  $[\alpha]_D = -19^\circ$  ( $c = 0.7$ ,  $CHCl_3$ ). **Source:** Sponge *Pellina triangulata* (Truk, Federated States of Micronesia). **Pharm:** Cytotoxic (NCI hmn tumor cell line panel, leukemia, colon, and melanoma tumor lines showed greater sensitivity). **Ref:** J. -R. Dai, et al, JNP, 1996, 59, 860

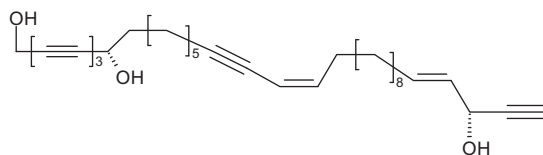
**231 Triangulyne D**

**Type:** Acetylenic alcohols.  $C_{41}H_{64}O_3$  Oil,  $[\alpha]_D = -10.7^\circ$  ( $c = 0.01$ ,  $CHCl_3$ ). **Source:** Sponge *Pellina triangulata* (Truk, Federated States of Micronesia). **Pharm:** Cytotoxic (NCI hmn tumor cell line panel, leukemia, colon, and melanoma tumor lines showed greater sensitivity). **Ref:** J. -R. Dai, et al, JNP, 1996, 59, 860



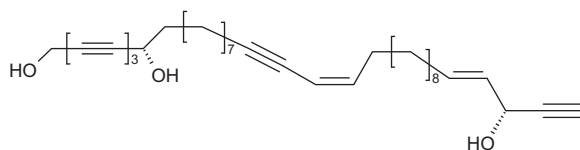
### 232 Triangulyne E

**Type:** Acetylenic alcohols.  $C_{32}H_{42}O_3$  Powder,  $[\alpha]_D = -11.4^\circ$  ( $c = 0.4$ ,  $CHCl_3$ ). **Source:** Sponge *Pellina triangulata* (Truk, Federated States of Micronesia). **Pharm:** Cytotoxic (NCI hmn tumor cell line panel, leukemia, colon, and melanoma tumor lines showed greater sensitivity). **Ref:** J. -R. Dai, et al, JNP, 1996, 59, 860



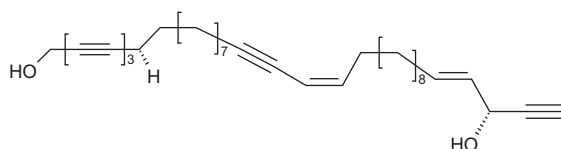
### 233 Triangulyne F

**Type:** Acetylenic alcohols.  $C_{34}H_{46}O_3$  Powder,  $[\alpha]_D = -10.6^\circ$  ( $c = 1.1$ ,  $CHCl_3$ ). **Source:** Sponge *Pellina triangulata* (Truk, Federated States of Micronesia). **Pharm:** Cytotoxic (NCI hmn tumor cell line panel, leukemia, colon, and melanoma tumor lines showed greater sensitivity). **Ref:** J. -R. Dai, et al, JNP, 1996, 59, 860



### 234 Triangulyne G

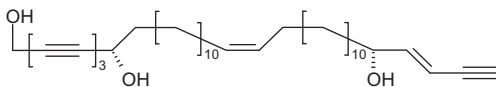
**Type:** Acetylenic alcohols.  $C_{34}H_{46}O_2$  Powder,  $[\alpha]_D = -10.5^\circ$  ( $c = 0.4$ ,  $CHCl_3$ ). **Source:** Sponge *Pellina triangulata* (Truk, Federated States of Micronesia). **Pharm:** Cytotoxic (NCI hmn tumor cell line panel, leukemia, colon, and melanoma tumor lines showed greater sensitivity). **Ref:** J. -R. Dai, et al, JNP, 1996, 59, 860



### 235 Triangulyne H

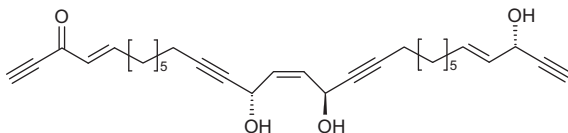
**Type:** Acetylenic alcohols.  $C_{37}H_{56}O_3$  Oil,  $[\alpha]_D = -23.7^\circ$  ( $c = 0.3$ ,  $CHCl_3$ ). **Source:** Sponge *Pellina triangulata* (Truk, Federated States of Micronesia). **Pharm:**

Cytotoxic (NCI hmn tumor cell line panel, leukemia, colon, and melanoma tumor lines showed greater sensitivity). Ref: J. -R. Dai, et al, JNP, 1996, 59, 860



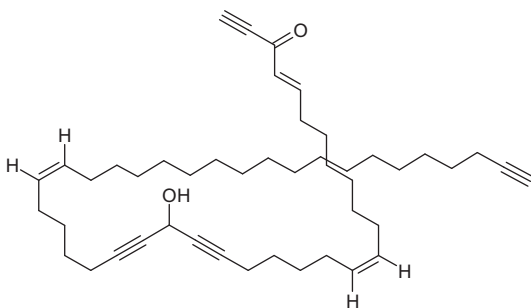
### 236 Adociacetylene A

14,17,28-Trihydroxy-4,15,26-triacontatriene-1,12,18,29-tetraen-3-one Type: Acetylenic ketones.  $C_{30}H_{38}O_4$   $[\alpha]_D^{22} = +110^\circ$  ( $c = 0.33$ ,  $CHCl_3$ ). Source: Sponge *Asocia* sp. (Okinawa). Pharm: Cytotoxic (endothelial cell-neutrophil leukocyte adhesin assay, tumor necrosis factor- $\alpha$  (5 JRU/mL)-stimulated endothelial cells, 1  $\mu\text{g/mL}$ ); cytotoxic (KB,  $IC_{50} = 0.8 \mu\text{g/mL}$ ); antibacterial (50  $\mu\text{g/disk}$  (IZD = 8 mm), *Escherichia coli*, IZD = 10 mm; *Bacillus subtilis*, IZD = 11 mm). Ref: M. Kobayashi, et al, CPB, 1996, 44, 720



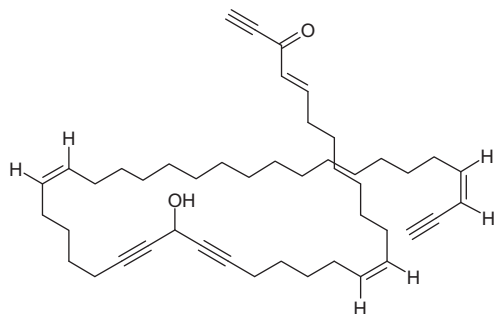
### 237 23,24-Dihydropetroformyne 6

Type: Acetylenic ketones.  $C_{46}H_{70}O_2$  Pale yellow oil,  $[\alpha]_D^{21} = -3.8^\circ$  ( $c = 0.42$ ,  $CHCl_3$ ). Source: Sponge *Petrosia ficiformis* (Mediterranean Sea). Pharm: Toxic (brine shrimp). Ref: Y. Guo, et al, JNP, 1995, 58, 712



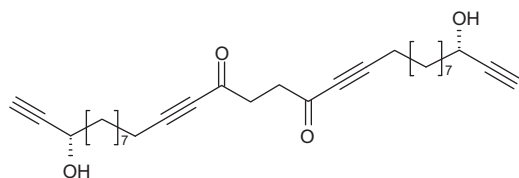
### 238 23,24-Dihydropetroformyne 7

Type: Acetylenic ketones.  $C_{46}H_{68}O_2$  Pale yellow oil,  $[\alpha]_D^{21} = -16.4^\circ$  ( $c = 0.24$ ,  $CHCl_3$ ). Source: Sponge *Petrosia ficiformis* (Mediterranean Sea). Pharm: Toxic (brine shrimp). Ref: Y. Guo, et al, JNP, 1995, 58, 712



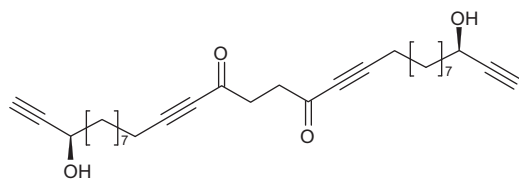
**239 3 $\alpha$ ,28 $\alpha$ -Dihydroxy-1,12,18,29-Triacontatetrayne-14,17-dione**

Type: Acetylenic ketones. C<sub>30</sub>H<sub>42</sub>O<sub>4</sub> Source: Sponge *Petrosia* sp. (Japan waters).  
Pharm: Cell division inhibitor (fertilized ascidian eggs); toxic (brine shrimp). Ref:  
 M. Ochi, et al, Chem. Lett., 1994, 89



**240 3 $\beta$ ,28 $\beta$ -Dihydroxy-1,12,18,29-Triacontatetrayne-14,17-dione**

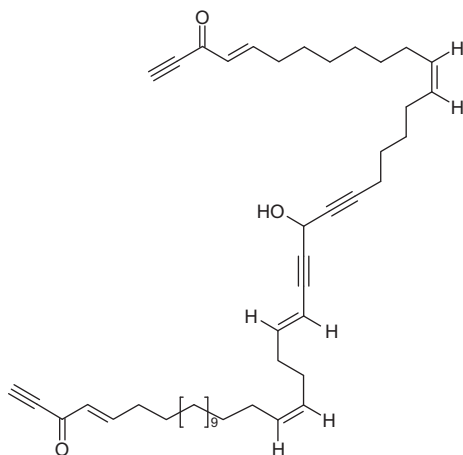
Type: Acetylenic ketones. C<sub>30</sub>H<sub>42</sub>O<sub>4</sub> Source: Sponge *Petrosia* sp. (Japan waters).  
Pharm: Cell division inhibitor (fertilized ascidian eggs); toxic (brine shrimp). Ref:  
 M. Ochi, et al, Chem. Lett., 1994, 89



**241 3,44-Dioxopetroformyne 1**

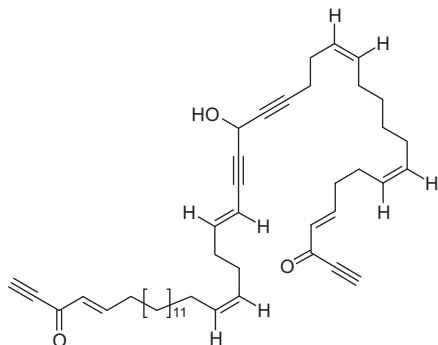
Type: Acetylenic ketones. C<sub>46</sub>H<sub>64</sub>O<sub>3</sub> Pale yellow oil,  $[\alpha]_D^{21} = -2.5^\circ$  ( $c = 0.86$ , CHCl<sub>3</sub>).  
Source: Sponge *Petrosia ficiformis* (Mediterranean Sea). Pharm: Toxic (brine shrimp). Ref: Y. Guo, et al, JNP, 1995, 58, 712





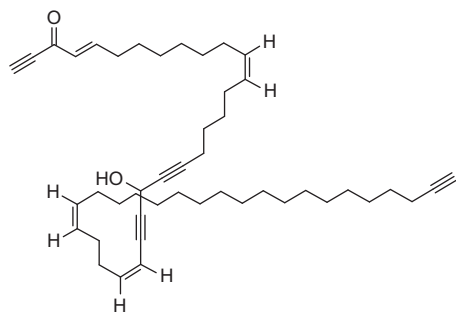
### 242 3,44-Dioxopetroformyne 2

Type: Acetylenic ketones.  $C_{46}H_{62}O_3$  Oil,  $[\alpha]_D^{21} = +2.3^\circ$  ( $c = 0.57$ ,  $CHCl_3$ ). Source: Sponge *Petrosia ficiformis* (Mediterranean Sea). Pharm: Toxic (brine shrimp). Ref: Y. Guo, et al, JNP, 1995, 58, 712



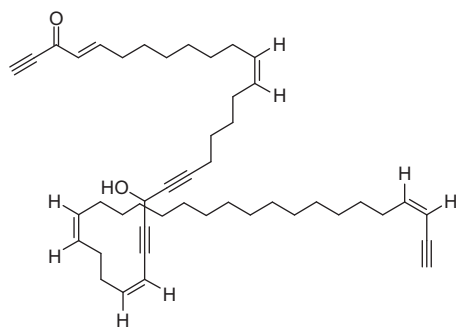
### 243 Isopetroformyne 6

Type: Acetylenic ketones.  $C_{46}H_{68}O_2$   $[\alpha]_D^{21} = +2.6^\circ$  ( $c = 0.27$ ,  $CHCl_3$ ). Source: Sponge *Petrosia ficiformis* (Mediterranean Sea). Pharm: Toxic (brine shrimp). Ref: Y. Guo, et al, JNP, 1995, 58, 712



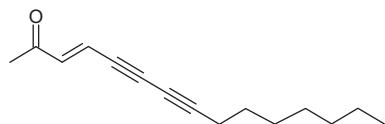
#### 244 Isopetroformyne 7

Type: Acetylenic ketones.  $C_{46}H_{66}O_2$   $[\alpha]_D^{21} = +2.5^\circ$  ( $c = 0.13$ ,  $CHCl_3$ ). Source: Sponge *Petrosia ficiformis* (Mediterranean Sea). Pharm: Toxic (brine shrimp). Ref: Y. Guo, et al, JNP, 1995, 58, 712



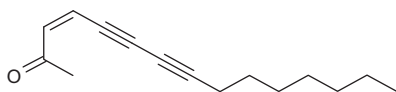
#### 245 Montiporyne A

3E-Pentadecaene-5,7-diyn-2-one Type: Acetylenic ketones.  $C_{15}H_{20}O$  Yellow gum. Source: Stony coral *Montipora* sp. (along shore of Mundo, Cheju, Korea, depth of 8m, on Nov. 4, 1996). Pharm: Cytotoxic (hmn solid carcinoma cells *in vitro*: A549  $ED_{50} > 50$   $\mu\text{g/mL}$ , SK-OV-3  $ED_{50} = 3.2$   $\mu\text{g/mL}$ , SK-MEL-2  $ED_{50} = 1.4$   $\mu\text{g/mL}$ , XF498  $ED_{50} = 1.9$   $\mu\text{g/mL}$ , HCT15  $ED_{50} = 3.7$   $\mu\text{g/mL}$ ; control Cisplatin,  $ED_{50} = 0.8$   $\mu\text{g/mL}$ , 1.2  $\mu\text{g/mL}$ , 1.5  $\mu\text{g/mL}$ , 0.7  $\mu\text{g/mL}$ , and 1.5  $\mu\text{g/mL}$  respectively); cell cycle inhibitor (flow cytometry, HCT116 cells were treated with 100  $\mu\text{g/mL}$  *E*-Pentadecaene-5,7-diyn-2-one for 24 h, apoptotic fraction was increased by 19%). Ref: N. Alam, et al, JNP, 2000, 63, 1511; 2001, 64, 1059

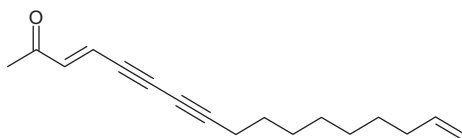


**246 Montiporyne B**

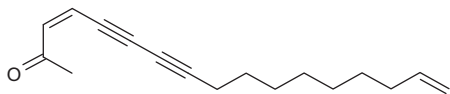
**Type:** Acetylenic ketones.  $C_{15}H_{20}O$  Yellow gum. **Source:** Stony coral *Montipora* sp. (along shore of Mundo, Cheju, Korea, depth of 8 m, on Nov. 4, 1996). **Pharm:** Cytotoxic (hmn solid carcinoma cells *in vitro*: A549  $ED_{50} > 50 \mu\text{g/mL}$ , SK-OV-3  $ED_{50} = 25.9 \mu\text{g/mL}$ , SK-MEL-2  $ED_{50} = 42.6 \mu\text{g/mL}$ , XF498  $ED_{50} > 50 \mu\text{g/mL}$ , HCT15  $ED_{50} > 50 \mu\text{g/mL}$ ; control Cisplatin,  $ED_{50} = 0.6 \mu\text{g/mL}$ ,  $0.9 \mu\text{g/mL}$ ,  $0.7 \mu\text{g/mL}$ ,  $0.6 \mu\text{g/mL}$ , and  $0.6 \mu\text{g/mL}$  respectively). **Ref:** B. H. Bae, et al, JNP, 2000, 63, 1511

**247 Montiporyne C**

**Type:** Acetylenic ketones.  $C_{17}H_{22}O$  Yellow oil. **Source:** Stony coral *Montipora* sp. (along shore of Mundo, Cheju, Korea, depth of 8 m, on Nov. 4, 1996). **Pharm:** Cytotoxic (hmn solid carcinoma cells *in vitro*: A549  $ED_{50} > 50 \mu\text{g/mL}$ , SK-OV-3  $ED_{50} = 2.5 \mu\text{g/mL}$ , SK-MEL-2  $ED_{50} = 1.5 \mu\text{g/mL}$ , XF498  $ED_{50} = 3.2 \mu\text{g/mL}$ , HCT15  $ED_{50} = 5.2 \mu\text{g/mL}$ ; control Cisplatin,  $ED_{50} = 0.8 \mu\text{g/mL}$ ,  $1.2 \mu\text{g/mL}$ ,  $1.5 \mu\text{g/mL}$ ,  $0.7 \mu\text{g/mL}$ , and  $1.5 \mu\text{g/mL}$  respectively). **Ref:** B. H. Bae, et al, JNP, 2000, 63, 1511

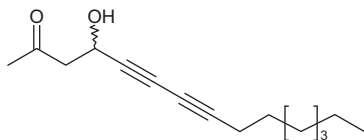
**248 Montiporyne D**

**Type:** Acetylenic ketones.  $C_{17}H_{22}O$  Pale yellow oil. **Source:** Stony coral *Montipora* sp. (along shore of Mundo, Cheju, Korea, depth of 8 m, on Nov. 4, 1996). **Pharm:** Cytotoxic (hmn solid carcinoma cells *in vitro*: A549  $ED_{50} > 50 \mu\text{g/mL}$ , SK-OV-3  $ED_{50} = 45.1 \mu\text{g/mL}$ , SK-MEL-2  $ED_{50} = 43.1 \mu\text{g/mL}$ , XF498  $ED_{50} > 50 \mu\text{g/mL}$ , HCT15  $ED_{50} > 50 \mu\text{g/mL}$ ; control Cisplatin,  $ED_{50} = 0.6 \mu\text{g/mL}$ ,  $0.9 \mu\text{g/mL}$ ,  $0.7 \mu\text{g/mL}$ ,  $0.6 \mu\text{g/mL}$ , and  $0.6 \mu\text{g/mL}$  respectively). **Ref:** B. H. Bae, et al, JNP, 2000, 63, 1511

**249 Montiporyne I**

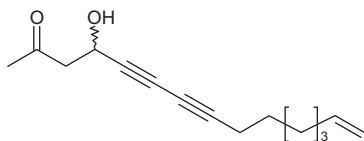
4-Hydroxy-5,7-pentadecadiyn-2-one **Type:** Acetylenic ketones.  $C_{15}H_{22}O_2$  Light yellow oil. **Source:** Stony coral *Montipora* sp. **Pharm:** Cytotoxic (A549,  $ED_{50} = 4.17 \mu\text{g/mL}$ ; SK-OV-3,  $ED_{50} = 1.81 \mu\text{g/mL}$ ; SK-MEL-2,  $ED_{50} = 1.40 \mu\text{g/mL}$ ; XF498,  $ED_{50} = 3.70 \mu\text{g/mL}$ ; HCT15,  $ED_{50} = 3.73 \mu\text{g/mL}$ ; control Cisplatin: A549,  $ED_{50} = 0.75 \mu\text{g/mL}$ ; SK-OV-3,

ED<sub>50</sub> = 1.09 µg/mL; SK-MEL-2, ED<sub>50</sub> = 2.18 µg/mL; XF498, ED<sub>50</sub> = 1.18 µg/mL; HCT15, ED<sub>50</sub> = 0.85 µg/mL). Ref: N. Alam, et al, JNP, 2001, 64, 1059



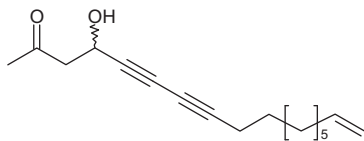
### 250 Montiporyne J

4-Hydroxy-14-pentadecene-5,7-diyn-2-one Type: Acetylenic ketones. C<sub>15</sub>H<sub>20</sub>O<sub>2</sub> Light yellow oil Source: Stony coral *Montipora* sp. Pharm: Cytotoxic (A549, ED<sub>50</sub> = 4.97 µg/mL; SK-OV-3, ED<sub>50</sub> = 3.85 µg/mL; SK-MEL-2, ED<sub>50</sub> = 3.74 µg/mL; XF498, ED<sub>50</sub> = 3.87 µg/mL; HCT15, ED<sub>50</sub> = 3.42 µg/mL; control Cisplatin: A549, ED<sub>50</sub> = 0.75 µg/mL; SK-OV-3, ED<sub>50</sub> = 1.09 µg/mL; SK-MEL-2, ED<sub>50</sub> = 2.18 µg/mL; XF498, ED<sub>50</sub> = 1.18 µg/mL; HCT15, ED<sub>50</sub> = 0.85 µg/mL). Ref: N. Alam, et al, JNP, 2001, 64, 1059



### 251 Montiporyne K

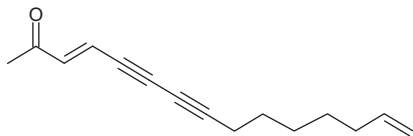
4-Hydroxy-16-heptadecene-5,7-diyn-2-one Type: Acetylenic ketones. C<sub>17</sub>H<sub>24</sub>O<sub>2</sub> Light yellow oil. Source: Stony coral *Montipora* sp. Pharm: Cytotoxic (A549, ED<sub>50</sub> = 4.91 µg/mL; SK-OV-3, ED<sub>50</sub> = 3.34 µg/mL; SK-MEL-2, ED<sub>50</sub> = 3.52 µg/mL; XF498, ED<sub>50</sub> = 4.45 µg/mL; HCT15, ED<sub>50</sub> = 4.18 µg/mL; control Cisplatin: A549, ED<sub>50</sub> = 0.75 µg/mL; SK-OV-3, ED<sub>50</sub> = 1.09 µg/mL; SK-MEL-2, ED<sub>50</sub> = 2.18 µg/mL; XF498, ED<sub>50</sub> = 1.18 µg/mL; HCT15, ED<sub>50</sub> = 0.85 µg/mL). Ref: N. Alam, et al, JNP, 2001, 64, 1059



### 252 Montiporyne L

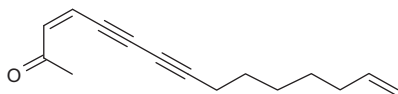
3E,14-Pentadecadiene-5,7-diyn-2-one Type: Acetylenic ketones. C<sub>15</sub>H<sub>18</sub>O Light yellow oil. Source: Stony coral *Montipora* sp. Pharm: Cytotoxic (A549, ED<sub>50</sub> = 6.39 µg/mL; SK-OV-3, ED<sub>50</sub> = 3.52 µg/mL; SK-MEL-2, ED<sub>50</sub> = 4.21 µg/mL; XF498, ED<sub>50</sub> = 5.50 µg/mL; HCT15, ED<sub>50</sub> = 4.56 µg/mL; control Cisplatin: A549, ED<sub>50</sub> = 0.75 µg/mL; SK-OV-3,

ED<sub>50</sub> = 1.09 µg/mL; SK-MEL-2, ED<sub>50</sub> = 2.18 µg/mL; XF498, ED<sub>50</sub> = 1.18 µg/mL; HCT15, ED<sub>50</sub> = 0.85 µg/mL). Ref: N. Alam, et al, JNP, 2001, 64, 1059



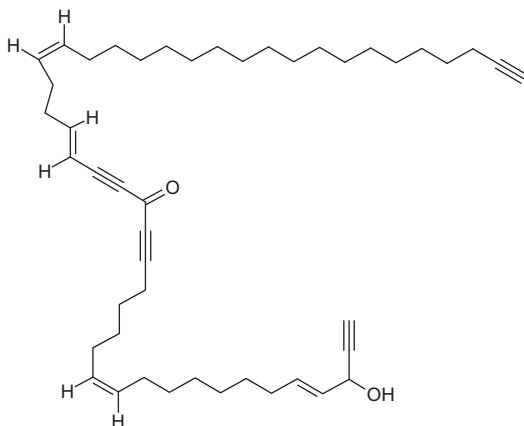
### 253 Montiporyne M

3Z,14-Pentadecadiene-5,7-diyn-2-one Type: Acetylenic ketones. C<sub>15</sub>H<sub>18</sub>O Light yellow oil. Source: Stony coral *Montipora* sp. Pharm: Cytotoxic (A549, ED<sub>50</sub> > 30 µg/mL; SK-OV-3, ED<sub>50</sub> = 5.23 µg/mL; SK-MEL-2, ED<sub>50</sub> = 4.61 µg/mL; XF498, ED<sub>50</sub> = 29.16 µg/mL; HCT15, ED<sub>50</sub> = 11.30 µg/mL; control Cisplatin: A549, ED<sub>50</sub> = 0.75 µg/mL; SK-OV-3, ED<sub>50</sub> = 1.09 µg/mL; SK-MEL-2, ED<sub>50</sub> = 2.18 µg/mL; XF498, ED<sub>50</sub> = 1.18 µg/mL; HCT15, ED<sub>50</sub> = 0.85 µg/mL). Ref: N. Alam, et al, JNP, 2001, 64, 1059



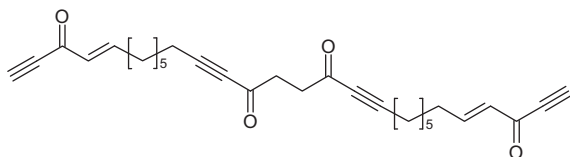
### 254 20-Oxopetroformyne 3

Type: Acetylenic ketones. C<sub>46</sub>H<sub>68</sub>O<sub>2</sub> Pale yellow oil, [α]<sub>D</sub><sup>20</sup> = -1.0° (c = 0.3, CHCl<sub>3</sub>). Source: Sponge *Petrosia ficiformis* (Mediterranean Sea). Pharm: Toxic (brine shrimp). Ref: Y. Guo, et al, JNP, 1995, 58, 712

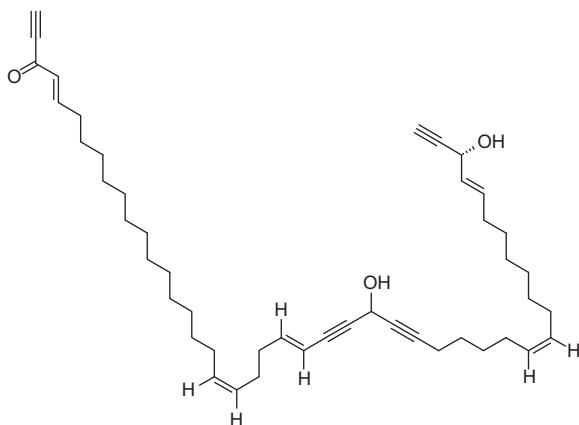


**255 Petroacetylene**

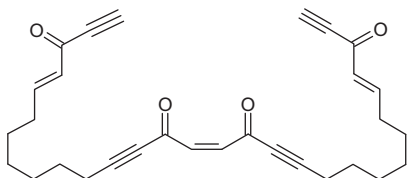
**Type:** Acetylenic ketones.  $C_{30}H_{34}O_4$  **Source:** Sponge *Petrosia solida* (Amami-Oshima, Japan). **Pharm:** Inhibits starfish embryo blastulation. **Ref:** S. Ohta, et al, Nat. Prod. Res., 2013, 27, 1842

**256 Petroformyne 10**

**Type:** Acetylenic ketones.  $C_{46}H_{66}O_3$  Pale yellow oil,  $[\alpha]_D^{21} = -3.5^\circ$  ( $c = 1.0$ ,  $CHCl_3$ ). **Source:** Sponge *Petrosia ficiformis* (Mediterranean Sea). **Pharm:** Toxic (brine shrimp). **Ref:** Y. Guo, et al, JNP, 1995, 58, 712

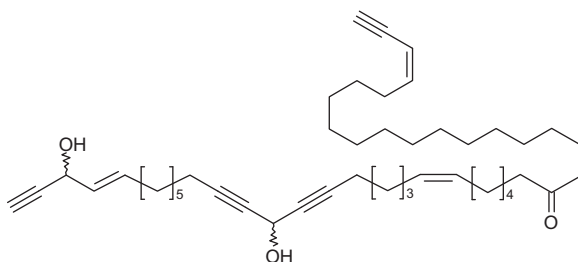
**257 Petrosynone**

4,15,26-Triacontatriene-1,12,18,29-tetrayne-3,14,17,28-tetrone **Type:** Acetylenic ketones.  $C_{30}H_{32}O_4$  Yellow oil. **Source:** Sponge *Petrosia* sp. **Pharm:** Antibacterial (*Bacillus subtilis*). **Ref:** M. Ochi, et al, Chem. Lett., 1994, 89

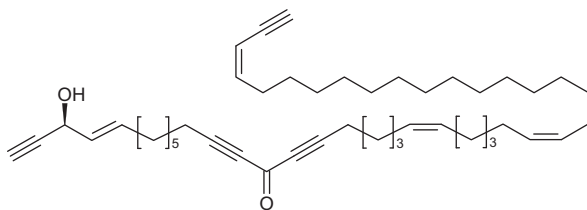


**258 Petrotetraol D**

**Type:** Acetylenic ketones.  $C_{46}H_{70}O_3$  Yellow oil. **Source:** Sponge *Petrosia* sp. (Korea waters). **Pharm:** DNA replication inhibitor (simian virus SV40, 125  $\mu\text{mol/L}$ , InRt = 66%, 250  $\mu\text{mol/L}$ , InRt = 80%, 500  $\mu\text{mol/L}$ , InRt = 100%); cytotoxic (A549,  $ED_{50} > 10 \mu\text{g/mL}$ ; SK-OV-3,  $ED_{50} > 10 \mu\text{g/mL}$ ; SK-MEL-2,  $ED_{50} > 10 \mu\text{g/mL}$ ; XF498,  $ED_{50} > 10 \mu\text{g/mL}$ ; HCT15,  $ED_{50} > 10 \mu\text{g/mL}$ ; control Cisplatin, A549,  $ED_{50} = 0.8 \mu\text{g/mL}$ ; SK-OV-3,  $ED_{50} = 1.2 \mu\text{g/mL}$ ; SK-MEL-2,  $ED_{50} = 1.5 \mu\text{g/mL}$ ; XF498,  $ED_{50} = 0.7 \mu\text{g/mL}$ ; HCT15,  $ED_{50} = 1.5 \mu\text{g/mL}$ ). **Ref:** Y. J. Lim, et al, JNP, 2001, 64, 46

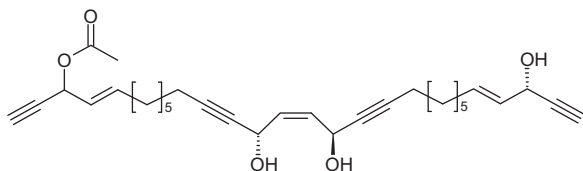
**259 Petrotetraol A**

**Type:** Acetylenic ketones.  $C_{46}H_{68}O_2$  Yellow oil. **Source:** Sponge *Petrosia* sp. (Korea waters). **Pharm:** DNA replication inhibitor (simian virus SV40, 125  $\mu\text{mol/L}$ , InRt = 76%, 250  $\mu\text{mol/L}$ , InRt = 100%, 500  $\mu\text{mol/L}$ , InRt = 100%); cytotoxic (A549,  $ED_{50} > 30 \mu\text{g/mL}$ ; SK-OV-3,  $ED_{50} = 4.6 \mu\text{g/mL}$ ; SK-MEL-2,  $ED_{50} = 5.2 \mu\text{g/mL}$ ; XF498,  $ED_{50} > 30 \mu\text{g/mL}$ ; HCT15,  $ED_{50} > 30 \mu\text{g/mL}$ ; control Cisplatin, A549,  $ED_{50} = 0.6 \mu\text{g/mL}$ ; SK-OV-3,  $ED_{50} = 0.9 \mu\text{g/mL}$ ; SK-MEL-2,  $ED_{50} = 0.7 \mu\text{g/mL}$ ; XF498,  $ED_{50} = 0.6 \mu\text{g/mL}$ ; HCT15,  $ED_{50} = 0.6 \mu\text{g/mL}$ ). **Ref:** Y. J. Lim, et al, JNP, 2001, 64, 46

**260 Adociacetylene C**

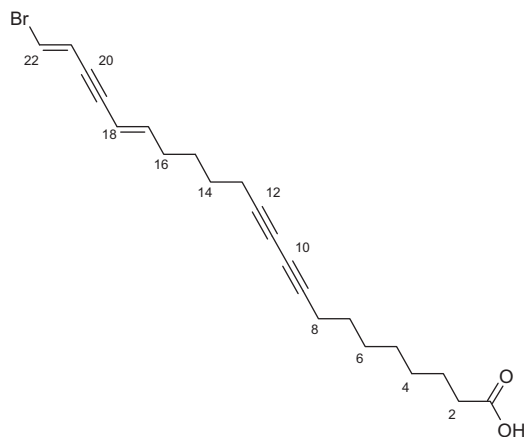
**Type:** Acetylenic acids and esters.  $C_{32}H_{42}O_5$   $[\alpha]_D^{20} = +90^\circ$  ( $c = 0.5$ ,  $\text{CHCl}_3$ ). **Source:** Sponge *Asocia* sp. (Okinawa). **Pharm:** Cytotoxic (endothelial cell-neutrophil

leukocyte adhesion assay, tumor necrosis factor- $\alpha$  (5 JRU/mL)-stimulated endothelial cells, 1  $\mu\text{g/mL}$ ). Ref: M. Kobayashi, et al, CPB, 1996, 44, 720



### 261 22-Bromo-17E,21E-docosadiene-9,11,19-triynoic acid

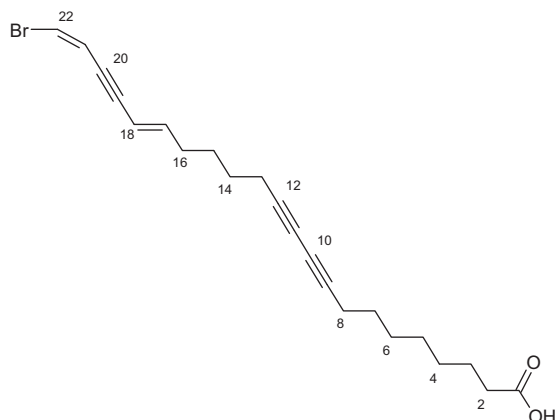
Type: Acetylenic acids and esters.  $\text{C}_{22}\text{H}_{27}\text{BrO}_2$  Amorphous powder. Source: Sponge *Xestospongia testudinaria*. Pharm: Stimulator of adipogenesis (preadipocyte differentiation-inducing activity (30  $\mu\text{mol/L}$ , 3+, 130  $\mu\text{mol/L}$ , 3+)). Ref: T. Akiyama, et al, Tetrahedron, 2013, 69, 6560



### 262 22-Bromo-17E,21Z-docosadiene-9,11,19-triynoic acid

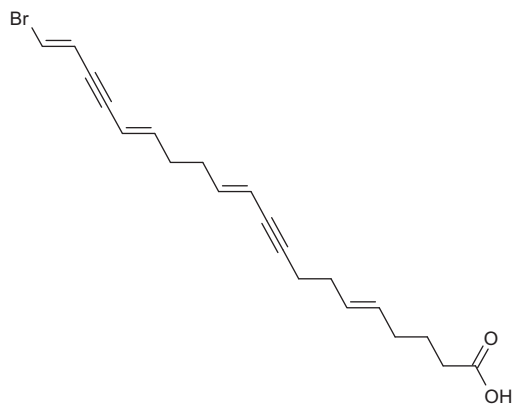
Type: Acetylenic acids and esters.  $\text{C}_{22}\text{H}_{27}\text{BrO}_2$  Amorphous powder. Source: Sponge *Xestospongia testudinaria*. Pharm: Stimulator of adipogenesis (preadipocyte differentiation-inducing activity (130  $\mu\text{mol/L}$ , 3+)). Ref: T. Akiyama, et al, Tetrahedron, 2013, 69, 6560





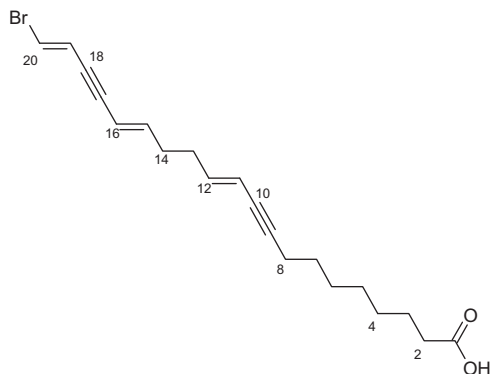
**263 (all-*E*)-20-Bromo-5,11,15,19-eicosatetraene-9,17-diynoic acid**

Type: Acetylenic acids and esters.  $C_{20}H_{23}BrO_2$  Amorph. powder. Source: Sponges *Xestospongia* sp. (an association of sponge cells and bacteria) and *Xestospongia testudinaria*. Pharm: Stimulator of adipogenesis (preadipocyte differentiation-inducing activity (8  $\mu\text{mol/L}$ , 3+, 30  $\mu\text{mol/L}$ , 3+, 130  $\mu\text{mol/L}$ , 3+); responsible for production of trichloroleucine metabolites in sponge *Dysidea herbacea*). Ref: S. E. Brantley, et al, Tetrahedron, 1995, 51, 7667 | T. Akiyama, et al, Tetrahedron, 2013, 69, 6560



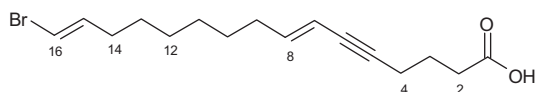
**264 (all-*E*)-20-Bromo-11,15,19-eicosatriene-9,17-diynoic acid**

Type: Acetylenic acids and esters.  $C_{20}H_{25}BrO_2$  Amorphous powder. Source: Sponge *Xestospongia testudinaria*. Pharm: Stimulator of adipogenesis (preadipocyte differentiation-inducing activity (2  $\mu\text{mol/L}$ , 2+, 8  $\mu\text{mol/L}$ , 3+, 30  $\mu\text{mol/L}$ , 3+, 130  $\mu\text{mol/L}$ , 3+)). Ref: T. Akiyama, et al, Tetrahedron, 2013, 69, 6560



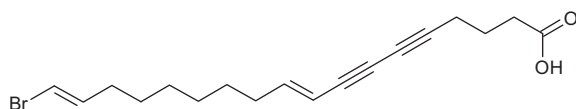
### 265 16-Bromo-7,15-hexadecadiene-5-ynoic acid

**Type:** Acetylenic acids and esters.  $C_{16}H_{23}BrO_2$  Colorless oil. **Source:** Sponge *Xestospongia testudinaria*. **Pharm:** Stimulator of adipogenesis (preadipocyte differentiation-inducing activity (30  $\mu\text{mol/L}$ , 2+, 130  $\mu\text{mol/L}$ , 3+)). **Ref:** T. Akiyama, et al, Tetrahedron, 2013, 69, 6560



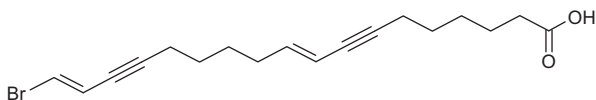
### 266 18-Bromo-9E,17E-octadecadiene-5,7-diynoic acid

**Type:** Acetylenic acids and esters.  $C_{18}H_{23}BrO_2$  Needles. **Source:** Sponge *Xestospongia muta* (Bahamas). **Pharm:** HIV-1 protease inhibitor (inhibits HIV-1 protease-catalyzed proteolysis of lactate dehydrogenase,  $IC_{50} = 12 \mu\text{mol/L}$ ). **Ref:** A. D. Patil, et al, JNP, 1992, 55, 1170



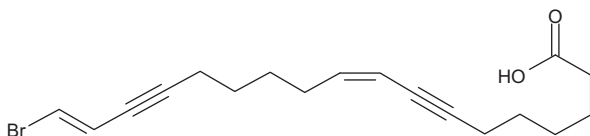
### 267 18-Bromo-9E,17E-octadecadiene-7,15-diynoic acid

**Type:** Acetylenic acids and esters.  $C_{18}H_{23}BrO_2$  Cryst. (MeOH aq), mp 66–67 °C, Sol. MeOH,  $CHCl_3$ ; poorly sol.  $H_2O$ . **Source:** Sponges *Xestospongia testudinaria* (Australia) and *Xestospongia testudinaria*. **Pharm:** Stimulator of adipogenesis (preadipocyte differentiation-inducing activity (8  $\mu\text{mol/L}$ , +, 30  $\mu\text{mol/L}$ , 3+, 130  $\mu\text{mol/L}$ , 3+)). **Ref:** R. J. Quinn, et al, Tet. Lett., 1985, 26, 1671 | T. Akiyama, et al, Tetrahedron, 2013, 69, 6560



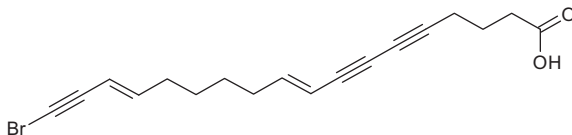
**268 18-Bromo-9Z,17E-octadecadiene-7,15-diynoic acid**

Type: Acetylenic acids and esters.  $C_{18}H_{23}BrO_2$  Source: Sponge *Xestospongia testudinaria*. Pharm: Stimulator of adipogenesis (preadipocyte differentiation-inducing activity (30  $\mu\text{mol/L}$ , 3+, 130  $\mu\text{mol/L}$ , 3+)). Ref: R. J. Quinn, et al, JNP, 1991, 54, 290 | T. Akiyama, et al, Tetrahedron, 2013, 69, 6560



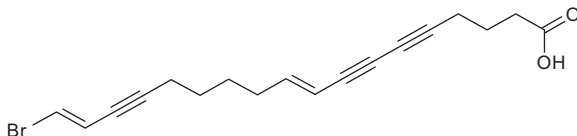
**269 18-Bromo-9E,15E-octadecadiene-5,7,17-triynoic acid**

Type: Acetylenic acids and esters.  $C_{18}H_{19}BrO_2$  Brown powder. Source: Sponge *Xestospongia muta* (Bahamas). Pharm: HIV-1 protease inhibitor (inhibits HIV-1 protease-catalyzed proteolysis of lactate dehydrogenase,  $IC_{50} = 7 \mu\text{mol/L}$ ). Ref: A. D. Patil, et al, JNP, 1992, 55, 1170



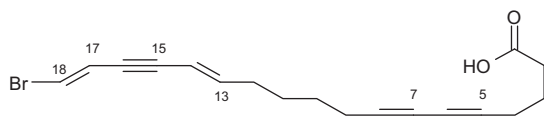
**270 18-Bromo-9E,17E-octadecadiene-5,7,15-triynoic acid**

Type: Acetylenic acids and esters.  $C_{18}H_{19}BrO_2$  Powder. Source: Sponge *Xestospongia muta* (Bahamas). Pharm: HIV-1 protease inhibitor (inhibits HIV-1 protease-catalyzed proteolysis of lactate dehydrogenase,  $IC_{50} = 8 \mu\text{mol/L}$ ). Ref: A. D. Patil, et al, JNP, 1992, 55, 1170



**271 18-Bromo-13E,17E-octadecadiene-5,7,15-triynoic acid**

Type: Acetylenic acids and esters.  $C_{18}H_{19}BrO_2$  Oil. Source: Sponge *Petrosia volcano* (Japan waters). Pharm: Antifungal. Ref: N. Fusetani, et al, Tetrahedron, 1993, 49, 1203



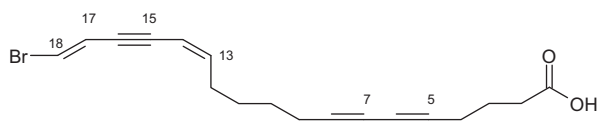
**272 18-Bromo-13E,17Z-octadecadiene-5,7,15-triynoic acid**

Type: Acetylenic acids and esters.  $C_{18}H_{19}BrO_2$  Oil. Source: Sponge *Petrosia volcano* (Japan waters). Pharm: Antifungal. Ref: N. Fusetani, et al, Tetrahedron, 1993, 49, 1203



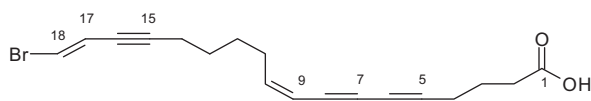
**273 18-Bromo-13Z,17E-octadecadiene-5,7,15-triynoic acid**

Type: Acetylenic acids and esters.  $C_{18}H_{19}BrO_2$  Oil. Source: Sponge *Petrosia volcano* (Japan waters). Pharm: Antifungal. Ref: N. Fusetani, et al, Tetrahedron, 1993, 49, 1203



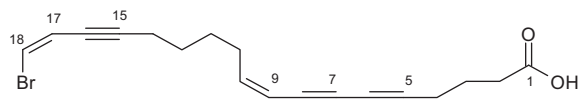
**274 18-Bromo-9,17E-octadecadiene-5,7,15-triynoic acid**

Type: Acetylenic acids and esters.  $C_{18}H_{19}BrO_2$  Oil. Source: Sponge *Petrosia volcano* (Japan waters). Pharm: Antifungal. Ref: N. Fusetani, et al, Tetrahedron, 1993, 49, 1203



**275 18-Bromo-9,17Z-octadecadiene-5,7,15-triynoic acid**

Type: Acetylenic acids and esters.  $C_{18}H_{19}BrO_2$  Oil. Source: Sponge *Petrosia volcano* (Japan waters). Pharm: Antifungal. Ref: N. Fusetani, et al, Tetrahedron, 1993, 49, 1203

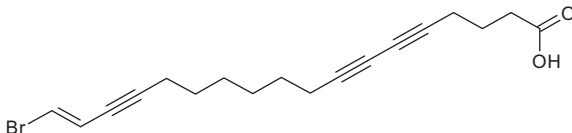


**276 18-Bromo-17Z-octadecadiene-5,7,15-triynoic acid**

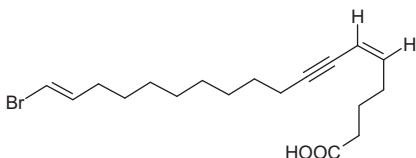
Type: Acetylenic acids and esters.  $C_{18}H_{21}BrO_2$  Oil. Source: Sponge *Petrosia volcano* (Japan waters). Pharm: Antifungal. Ref: N. Fusetani, et al, Tetrahedron, 1993, 49, 1203

**277 18-Bromo-17E-octadecadiene-5,7,15-triynoic acid**

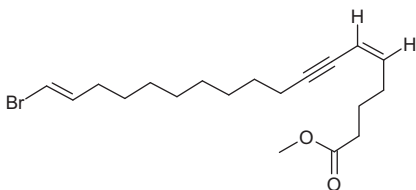
Xestospongic acid Type: Acetylenic acids and esters.  $C_{18}H_{21}BrO_2$  Source: Sponge *Xestospongia testudinaria* (Mayotte) and *Xestospongia testudinaria*. Pharm: Antibacterial (*Staphylococcus aureus*, 100  $\mu$ g/disk, IZD = 12 mm, weak); stimulator of adipogenesis (preadipocyte differentiation-inducing activity (130  $\mu$ mol/L, 3+)). Ref: M. L. Bourguet-Kondracki, et al, Tet. Lett., 1992, 33, 225 | T. Akiyama, et al, Tetrahedron, 2013, 69, 6560

**278 18-Bromo-5Z,17E-octadecadien-7-ynoic acid**

Type: Acetylenic acids and esters.  $C_{18}H_{27}BrO_2$  Source: Sponge *Xestospongia* sp. (Okinawa). Pharm: Cytotoxic ( $L_{1210}$  and KB). Ref: Y. Li, et al, J. Chem. Res. (S), 1995, 126; J. Chem. Res. (M), 1995, 0901

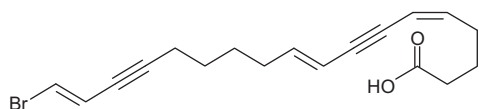
**279 18-Bromo-5Z,17E-octadecadien-7-ynoic acid methyl ester**

Type: Acetylenic acids and esters.  $C_{19}H_{29}BrO_2$  Source: Sponge *Xestospongia* sp. (Okinawa). Pharm: Cytotoxic ( $L_{1210}$  and KB). Ref: Y. Li, et al, J. Chem. Res. (S), 1995, 126; J. Chem. Res. (M), 1995, 0901

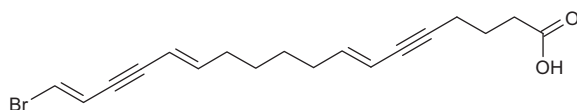


**280 18-Bromo-5Z,9E,17E-octadecatriene-7,15-diynoic acid**

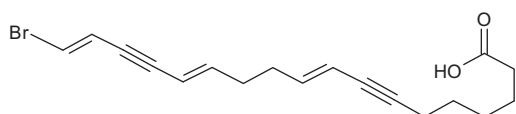
Type: Acetylenic acids and esters.  $C_{18}H_{21}BrO_2$  Source: Sponge *Xestospongia testudinaria*. Pharm: Stimulator of adipogenesis (preadipocyte differentiation-inducing activity (8  $\mu\text{mol/L}$ , +, 30  $\mu\text{mol/L}$ , 3+, 130  $\mu\text{mol/L}$ , 3+)). Ref: M. Taniguchi, et al, CPB, 2008, 56, 378 | T. Akiyama, et al, Tetrahedron, 2013, 69, 6560

**281 18-Bromo-7E,13E,17E-octadecatriene-5,15-diynoic acid**

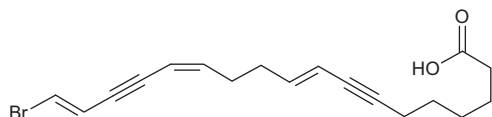
Type: Acetylenic acids and esters.  $C_{18}H_{21}BrO_2$  Powder. Source: Sponge *Xestospongia muta* (Bahamas). Pharm: HIV-1 protease inhibitor (inhibits HIV-1 protease-catalyzed proteolysis of lactate dehydrogenase,  $IC_{50} = 10 \mu\text{mol/L}$ ). Ref: A. D. Patil, et al, JNP, 1992, 55, 1170

**282 18-Bromo-9E,13E,17E-octadecatriene-7,15-diynoic acid**

Type: Acetylenic acids and esters.  $C_{18}H_{21}BrO_2$  Source: Sponge *Xestospongia testudinaria*. Pharm: Stimulator of adipogenesis (preadipocyte differentiation-inducing activity (8  $\mu\text{mol/L}$ , 3+, 30  $\mu\text{mol/L}$ , 3+, 130  $\mu\text{mol/L}$ , 3+)). Ref: M. Taniguchi, et al, CPB, 2008, 56, 378 | T. Akiyama, et al, Tetrahedron, 2013, 69, 6560

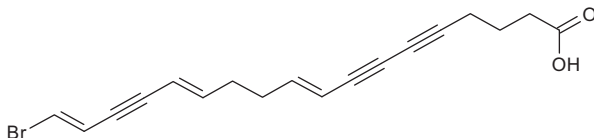
**283 18-Bromo-9E,13Z,17E-octadecatriene-7,15-diynoic acid**

Type: Acetylenic acids and esters.  $C_{18}H_{21}BrO_2$  Source: Sponge *Xestospongia testudinaria*. Pharm: Stimulator of adipogenesis (preadipocyte differentiation-inducing activity (30  $\mu\text{mol/L}$ , +, 130  $\mu\text{mol/L}$ , 3+)). Ref: M. Taniguchi, et al, CPB, 2008, 56, 378 | T. Akiyama, et al, Tetrahedron, 2013, 69, 6560

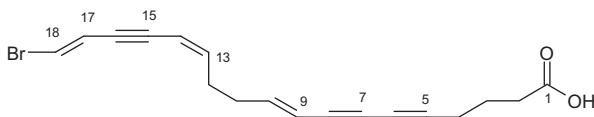


**284 18-Bromo-9E,13E,17E-octadecatriene-5,7,15-triynoic acid**

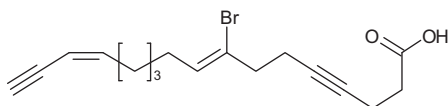
Type: Acetylenic acids and esters.  $C_{18}H_{17}BrO_2$  Amorph. powder. Source: Sponge *Xestospongia muta* (Bahamas). Pharm: HIV-1 protease inhibitor (inhibits HIV-1 protease-catalyzed proteolysis of lactate dehydrogenase,  $IC_{50} = 6 \mu\text{mol/L}$ ). Ref: A. D. Patil, et al, JNP, 1992, 55, 1170

**285 18-Bromo-9,13,17-octadecatriene-5,7,15-triynoic acid**

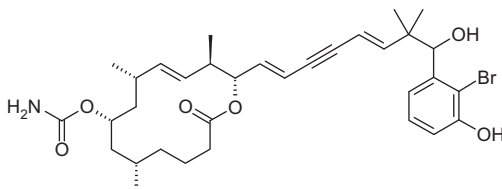
Type: Acetylenic acids and esters.  $C_{18}H_{17}BrO_2$  Oil. Source: Sponge *Petrosia volcano* (Japan waters). Pharm: Antifungal. Ref: N. Fusetani, et al, Tetrahedron, 1993, 49, 1203

**286 Bromotheoynic acid**

Type: Acetylenic acids and esters.  $C_{17}H_{21}BrO_2$  Source: Lithistid sponge *Theonella swinhoei* (Tanegashima, Kagoshima, Japan). Pharm: Inhibitor of starfish egg maturation. Ref: N. Aoki, et al, Nat. Prod. Res., 2013, 27, 117

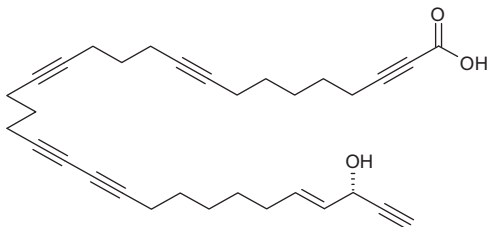
**287 Callyspongiolide**

Type: Acetylenic acids and esters.  $C_{33}H_{44}BrNO_6$  Source: Sponge *Callyspongia* sp. (Ambon, Indonesia). Pharm: Cytotoxic (three HTCLs,  $IC_{50} = 60\text{--}320 \text{ nmol/L}$ , potent, notably, the viability of cell lines treated with callyspongiolide was not affected by QVD-OPh, a known caspase-inhibitor, suggesting the test compound induces cellular toxicity in a caspase-independent manner). Ref: C. -D. Pham, et al, Org. Lett., 2014, 16, 266

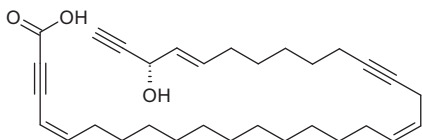


**288 Callyspongynic acid**

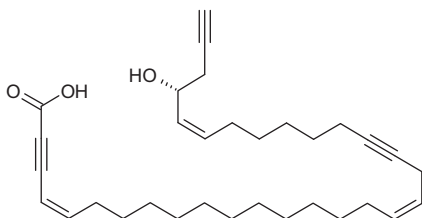
(*S,E*)-30-Hydroxy-28-dotriacontene-2,9,14,19,21,31-hexynoic acid Type: Acetylenic acids and esters.  $C_{32}H_{38}O_3$  Oil,  $[\alpha]_D = +5.4^\circ$  ( $c = 0.5$ , EtOH). Source: Sponge *Callyspongia truncata*. Pharm:  $\alpha$ -Glucosidase inhibitor. Ref: Y. Nakao, et al, JNP, 2002, 65, 922

**289 Corticatic acid A**

(4*Z*,17*Z*,27*E*,29*R*)-29-Hydroxy-4,17,27-hentriacontatriene-2,20,30-triynoic acid Type: Acetylenic acids and esters.  $C_{31}H_{44}O_3$  Oil,  $[\alpha]_D^{23} = +28^\circ$  ( $c = 0.1$ ,  $CHCl_3$ ). Source: Sponge *Pertosia corticata* (Japan waters). Pharm: Antifungal (*Mortierella ramanniana*). Ref: H. -Y. Li, et al, JNP, 1994, 57, 1464

**290 Corticatic acid B**

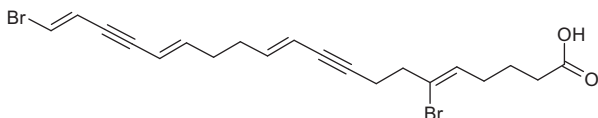
Type: Acetylenic acids and esters.  $C_{31}H_{44}O_3$  Oil,  $[\alpha]_D^{23} = +9^\circ$  ( $c = 0.04$ ,  $CHCl_3$ ). Source: Sponge *Pertosia corticata* (Japan waters). Pharm: Antifungal (*Mortierella ramanniana*). Ref: H. -Y. Li, et al, JNP, 1994, 57, 1464

**291 (5*Z*,11*E*,15*E*,19*E*)-6,20-Dibromoicosa-5,11,15,19-tetraen-9,17-diynoic acid**

Type: Acetylenic acids and esters.  $C_{20}H_{22}Br_2O_2$  Amorph. powder. Source: Eubacteria *Eubacteria* sp. (India western Ocean) from sponge *Xestospongia* sp. (tissues), sponge *Xestospongia testudinaria*. Pharm: Stimulator of adipogenesis (preadipocyte differentiation-inducing activity (8  $\mu\text{mol/L}$ , +, 30  $\mu\text{mol/L}$ , 3+, 130  $\mu\text{mol/L}$ , 3+);

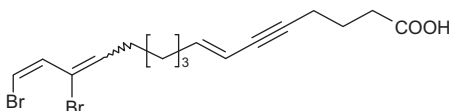


responsible for production of trichloroleucine metabolites in sponge *Dysidea herbacea*). Ref: S. E. Brantley, et al, Tetrahedron, 1995, 51, 7667 | T. Akiyama, et al, Tetrahedron, 2013, 69, 6560



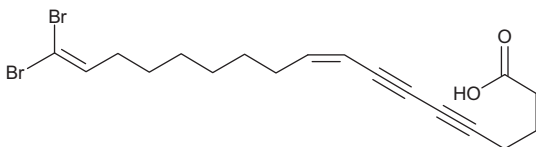
### 292 (7E,15Z)-14,16-Dibromo-7,13,15-hexadecatrien-5-ynoic acid

Type: Acetylenic acids and esters.  $C_{16}H_{20}Br_2O_2$  Oil. Source: Sponge *Xestospongia muta*. Pharm: Cytotoxic; CNS activity (*in vivo*). Ref: F. J. Schmitz, et al, Tet. Lett., 1978, 3637



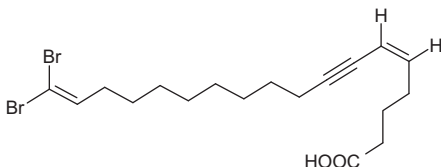
### 293 18,18-Dibromo-9Z,17E-octadecadiene-5,7-diynoic acid

Type: Acetylenic acids and esters.  $C_{18}H_{22}Br_2O_2$  Source: Sponge *Xestospongia testudinaria*. Pharm: Stimulator of adipogenesis (preadipocyte differentiation-inducing activity (30  $\mu\text{mol/L}$ , +, 130  $\mu\text{mol/L}$ , 3+)). Ref: M. Taniguchi, et al, CPB, 2008, 56, 378 | T. Akiyama, et al, Tetrahedron, 2013, 69, 6560



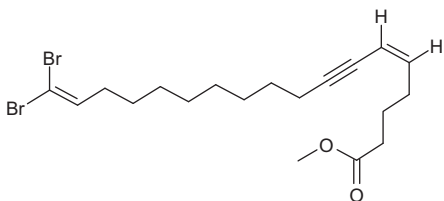
### 294 (Z)-18,18-Dibromo-5,17-octadecadien-7-ynoic acid

Type: Acetylenic acids and esters.  $C_{18}H_{26}Br_2O_2$  Source: Sponge *Xestospongia* sp. (Okinawa). Pharm: Cytotoxic ( $L_{1210}$  and KB). Ref: Y. Li, et al, J. Chem. Res. (S), 1995, 126 | J. Chem. Res. (M), 1995, 0901

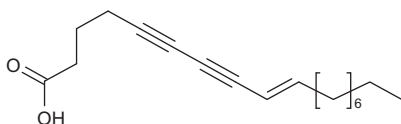


**295 18,18-Dibromo-5Z,17-octadecadien-7-ynoic acid methyl ester**

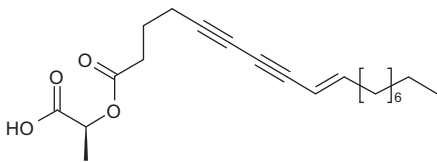
Type: Acetylenic acids and esters.  $C_{19}H_{28}Br_2O_2$  Source: Sponge *Xestospongia* sp. (Okinawa). Pharm: Cytotoxic (L<sub>1210</sub> and KB). Ref: Y. Li, et al, J. Chem. Res. (S), 1995, 126; J. Chem. Res. (M), 1995, 0901

**296 Heterofibrin A<sub>1</sub>**

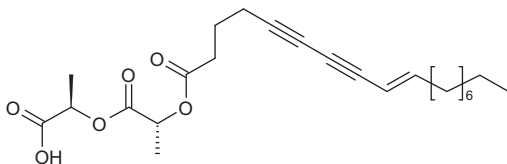
Type: Acetylenic acids and esters.  $C_{18}H_{26}O_2$  Pale yellow oil. Source: Sponge *Spongia* sp. (Great Australian Bight). Pharm: Lipid droplet (cytoplasmic organelles containing neutral lipid found in eukaryotic cells) formation inhibitor (fibroblasts, 10  $\mu\text{mol/L}$ , InRt = 52%, not cytotoxic at similar concentration); cytotoxic inactive (fibroblasts, HeLa and MDA-MB-231, 30  $\mu\text{mol/L}$ , such inhibitor have potential application in management of obesity, diabetes and atherosclerosis); antibacterial (*Escherichia coli*,  $IC_{90} > 50 \mu\text{mol/L}$ , *Bacillus subtilis*,  $IC_{90} = 22 \mu\text{mol/L}$ , *Staphylococcus aureus*,  $IC_{90} = 45 \mu\text{mol/L}$ ); antifungal (*Candida albicans* and *Pseudomonas aeruginosa*,  $IC_{90} > 50 \mu\text{mol/L}$ ). Ref: A. A. Salim, et al, Org. Biomol. Chem., 2010, 8, 3188

**297 Heterofibrin A<sub>2</sub>**

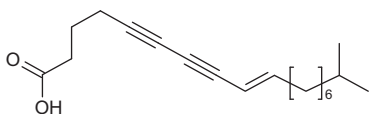
Type: Acetylenic acids and esters.  $C_{21}H_{30}O_4$  Pale yellow oil,  $[\alpha]_D^{20} = -9.2^\circ$  ( $c = 0.25$ ,  $\text{CHCl}_3$ ). Source: Sponge *Spongia* sp. (Great Australian Bight). Pharm: Lipid droplet formation inhibitor (fibroblasts, 10  $\mu\text{mol/L}$ , InRt = 0%; cytotoxic inactive (fibroblasts, HeLa and MDA-MB-231, 30  $\mu\text{mol/L}$ , such inhibitor have potential application in management of obesity, diabetes and atherosclerosis); antibacterial (*Escherichia coli*,  $IC_{90} > 50 \mu\text{mol/L}$ , *Bacillus subtilis*,  $IC_{90} = 26 \mu\text{mol/L}$ , *Staphylococcus aureus*,  $IC_{90} > 50 \mu\text{mol/L}$ ); antifungal (*Candida albicans* and *Pseudomonas aeruginosa*,  $IC_{90} > 50 \mu\text{mol/L}$ ). Ref: A. A. Salim, et al, Org. Biomol. Chem., 2010, 8, 3188

**298 Heterofibrin A<sub>3</sub>**

**Type:** Acetylenic acids and esters. C<sub>24</sub>H<sub>34</sub>O<sub>6</sub> Pale yellow oil,  $[\alpha]_D^{20} = +11^\circ$  ( $c = 0.05$ , CHCl<sub>3</sub>). **Source:** Sponge *Spongia* sp. (Great Australian Bight). **Pharm:** Lipid droplet formation inhibitor (fibroblasts, 10 μmol/L, InRt = 14%; cytotoxic inactive (fibroblasts, HeLa and MDA-MB-231, 30 μmol/L, such inhibitor have potential application in management of obesity, diabetes and atherosclerosis); antibacterial (*Escherichia coli*, IC<sub>90</sub> > 50 μmol/L, *Bacillus subtilis*, IC<sub>90</sub> = 29 μmol/L), *Staphylococcus aureus*, IC<sub>90</sub> > 50 μmol/L); antifungal (*Candida albicans* and *Pseudomonas aeruginosa*, IC<sub>90</sub> > 50 μmol/L). **Ref:** A. A. Salim, et al, Org. Biomol. Chem., 2010, 8, 3188

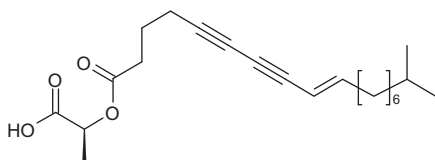
**299 Heterofibrin B<sub>1</sub>**

**Type:** Acetylenic acids and esters. C<sub>19</sub>H<sub>28</sub>O<sub>2</sub> Pale yellow oil. **Source:** Sponge *Spongia* sp. (Great Australian Bight). **Pharm:** Lipid droplet formation inhibitor (fibroblasts, 10 μmol/L, InRt = 60%, not cytotoxic at similar concentration); cytotoxic inactive (fibroblasts, HeLa and MDA-MB-231, 30 μmol/L, such inhibitor have potential application in management of obesity, diabetes and atherosclerosis); antibacterial (*Escherichia coli*, IC<sub>90</sub> > 50 μmol/L, *Bacillus subtilis*, IC<sub>90</sub> = 10 μmol/L, *Staphylococcus aureus*, IC<sub>90</sub> = 21 μmol/L); antifungal (*Candida albicans* and *Pseudomonas aeruginosa*, IC<sub>90</sub> > 50 μmol/L). **Ref:** A. A. Salim, et al, Org. Biomol. Chem., 2010, 8, 3188

**300 Heterofibrin B<sub>2</sub>**

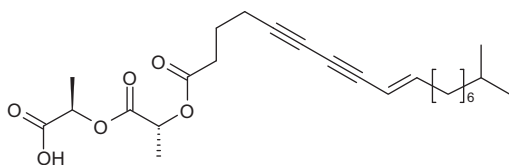
**Type:** Acetylenic acids and esters. C<sub>22</sub>H<sub>32</sub>O<sub>4</sub> Pale yellow oil,  $[\alpha]_D^{20} = -10^\circ$  ( $c = 0.13$ , CHCl<sub>3</sub>). **Source:** Sponge *Spongia* sp. (Great Australian Bight). **Pharm:** Lipid droplet formation inhibitor (fibroblasts, 10 μmol/L, InRt = 24%; cytotoxic inactive (fibroblasts, HeLa and MDA-MB-231, 30 μmol/L, such inhibitor have potential application in management of obesity, diabetes and atherosclerosis); antibacterial (*Escherichia*

*coli*,  $IC_{90} > 50 \mu\text{mol/L}$ , *Bacillus subtilis*,  $IC_{90} = 17 \mu\text{mol/L}$ , *Staphylococcus aureus*,  $IC_{90} > 50 \mu\text{mol/L}$ ; antifungal (*Candida albicans* and *Pseudomonas aeruginosa*,  $IC_{90} > 50 \mu\text{mol/L}$ ). Ref: A. A. Salim, et al, *Org. Biomol. Chem.*, 2010, 8, 3188



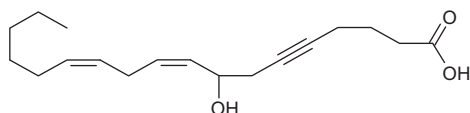
### 301 Heterofibrin B<sub>3</sub>

Type: Acetylenic acids and esters.  $C_{25}H_{36}O_6$  Pale yellow oil,  $[\alpha]_D^{20} = +16^\circ$  ( $c = 0.13$ ,  $CHCl_3$ ). Source: Sponge *Spongia* sp. (Great Australian Bight). Pharm: Lipid droplet formation inhibitor (fibroblasts,  $10 \mu\text{mol/L}$ ,  $InRt = 24\%$ ; cytotoxic inactive (fibroblasts, HeLa and MDA-MB-231,  $30 \mu\text{mol/L}$ , such inhibitor have potential application in management of obesity, diabetes and atherosclerosis); antibacterial (*Escherichia coli*,  $IC_{90} > 50 \mu\text{mol/L}$ , *Bacillus subtilis*,  $IC_{90} = 27 \mu\text{mol/L}$ , *Staphylococcus aureus*,  $IC_{90} > 50 \mu\text{mol/L}$ ); antifungal (*Candida albicans* and *Pseudomonas aeruginosa*,  $IC_{90} > 50 \mu\text{mol/L}$ ). Ref: A. A. Salim, et al, *Org. Biomol. Chem.*, 2010, 8, 3188



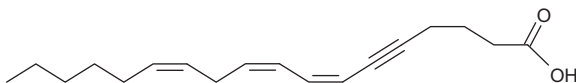
### 302 (9Z,12Z)-7-Hydroxyoctadeca-9,12-dien-5-ynoic acid

Type: Acetylenic acids and esters.  $C_{18}H_{28}O_3$   $[\alpha]_D = +6.8^\circ$  ( $c = 1.5$ ,  $CHCl_3$ ). Source: Red alga *Liagora farinosa*. Pharm: Ichthyotoxic. Ref: V. J. Paul, et al, *Tet. Lett.*, 1980, 21, 3327



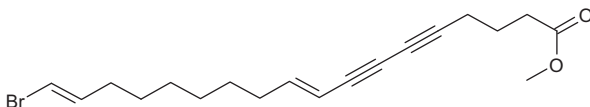
### 303 Liagoric acid

Type: Acetylenic acids and esters.  $C_{18}H_{26}O_2$  Berdy sol: sol.  $CHCl_3$ , hexane; poorly sol.  $H_2O$ . Source: Red alga *Liagora farinosa*. Pharm: Ichthyotoxic; prostaglandin biosynthesis inhibitor. Ref: V. J. Paul, et al, *Tet. Lett.*, 1980, 21, 3327



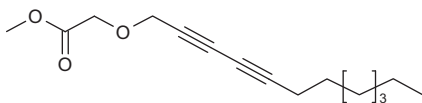
### 304 Methyl-18-Bromo-9E,17E-octadecadiene-5,7-diyynoate

Type: Acetylenic acids and esters.  $C_{19}H_{25}BrO_2$  Needles. Source: Sponge *Xestospongia muta* (Bahamas). Pharm: Inhibits HIV-1 protease-catalyzed proteolysis of lactate dehydrogenase ( $IC_{50} = 10 \mu\text{mol/L}$ ). Ref: A. D. Patil, et al, JNP, 1992, 55, 1170



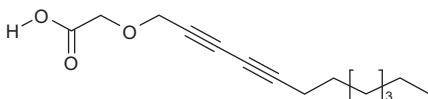
### 305 Methyl montiporate A

Type: Acetylenic acids and esters.  $C_{15}H_{22}O_3$  Yellow oil. Source: Stony coral *Montipora* sp. Pharm: Cytotoxic (A549,  $ED_{50} > 30 \mu\text{g/mL}$ ; SK-OV-3,  $ED_{50} = 20.52 \mu\text{g/mL}$ ; SK-MEL-2,  $ED_{50} > 30 \mu\text{g/mL}$ ; XF498,  $ED_{50} > 30 \mu\text{g/mL}$ ; HCT15,  $ED_{50} = 25.61 \mu\text{g/mL}$ ; control Cisplatin: A549,  $ED_{50} = 0.75 \mu\text{g/mL}$ ; SK-OV-3,  $ED_{50} = 1.09 \mu\text{g/mL}$ ; SK-MEL-2,  $ED_{50} = 2.18 \mu\text{g/mL}$ ; XF498,  $ED_{50} = 1.18 \mu\text{g/mL}$ ; HCT15,  $ED_{50} = 0.85 \mu\text{g/mL}$ ). Ref: N. Alam, et al, JNP, 2001, 64, 1059



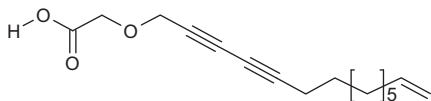
### 306 Montiporic acid A

Type: Acetylenic acids and esters.  $C_{14}H_{20}O_3$  Oil. Source: Stony corals *Montipora digitata* (eggs), *Madrepora oculata* and *Montipora* sp. Pharm: Cytotoxic (A549,  $ED_{50} = 6.31 \mu\text{g/mL}$ ; SK-OV-3,  $ED_{50} = 7.50 \mu\text{g/mL}$ ; SK-MEL-2,  $ED_{50} = 7.97 \mu\text{g/mL}$ ; XF498,  $ED_{50} = 7.72 \mu\text{g/mL}$ ; HCT15,  $ED_{50} = 8.30 \mu\text{g/mL}$ ; control Cisplatin: A549,  $ED_{50} = 0.75 \mu\text{g/mL}$ ; SK-OV-3,  $ED_{50} = 1.09 \mu\text{g/mL}$ ; SK-MEL-2,  $ED_{50} = 2.18 \mu\text{g/mL}$ ; XF498,  $ED_{50} = 1.18 \mu\text{g/mL}$ ; HCT15,  $ED_{50} = 0.85 \mu\text{g/mL}$ ); cytotoxic ( $P_{388}$ ,  $IC_{50} = 5.0 \mu\text{g/mL}$ ); antibacterial (*Escherichia coli*); feeding attractant (prosobranch *Drupella cornus*). Ref: N. Fusetani, et al, JNP, 1996, 59, 796 | H. A. Stefani, et al, Tet. Lett., 1999, 40, 9215 | N. Alam, et al, JNP, 2001, 64, 1059 | M. Kita, et al, Tet. Lett., 2005, 46, 8583

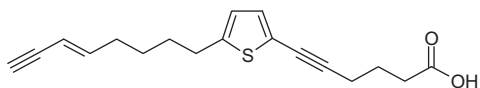


**307 Montiporic acid B**

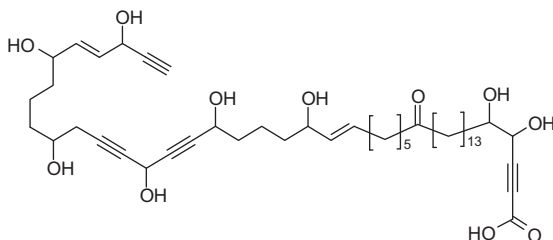
**Type:** Acetylenic acids and esters.  $C_{16}H_{22}O_3$  Oil (Na salt). **Source:** Stony corals *Montipora digitata* (eggs), and *Montipora* sp. **Pharm:** Cytotoxic (A549,  $ED_{50} = 6.26 \mu\text{g/mL}$ ; SK-OV-3,  $ED_{50} = 4.88 \mu\text{g/mL}$ ; SK-MEL-2,  $ED_{50} = 4.68 \mu\text{g/mL}$ ; XF498,  $ED_{50} = 4.96 \mu\text{g/mL}$ ; HCT15,  $ED_{50} = 4.47 \mu\text{g/mL}$ ; control Cisplatin: A549,  $ED_{50} = 0.75 \mu\text{g/mL}$ ; SK-OV-3,  $ED_{50} = 1.09 \mu\text{g/mL}$ ; SK-MEL-2,  $ED_{50} = 2.18 \mu\text{g/mL}$ ; XF498,  $ED_{50} = 1.18 \mu\text{g/mL}$ ; HCT15,  $ED_{50} = 0.85 \mu\text{g/mL}$ ); cytotoxic ( $P_{388}$ ,  $IC_{50} = 12.0 \mu\text{g/mL}$ ); antibacterial (*Escherichia coli*). **Ref:** N. Fusetani, et al, JNP, 1996, 59, 796 | H. A. Stefani, et al, Tet. Lett., 1999, 40, 9215 | N. Alam, et al, JNP, 2001, 64, 1059

**308 6-[5-(5-Octen-7-ynyl)-2-thienyl]-5-hexynoic acid**

**Type:** Acetylenic acids and esters.  $C_{18}H_{20}O_2S$  Oil. **Source:** Calcareous sponge *Grantia* cf. *waguensis* (Okinawa). **Pharm:** Cytotoxic (NBT-T2,  $IC_{50} > 20 \mu\text{g/mL}$ ); antibacterial (*Staphylococcus aureus* IAM 12084, MIC =  $64 \mu\text{g/mL}$ , control Rifampicin, MIC =  $64 \mu\text{g/mL}$ ; *Escherichia coli* ATCC 12600, MIC =  $128 \mu\text{g/mL}$ , Rifampicin, MIC =  $64 \mu\text{g/mL}$ ). **Ref:** M. D. B. Tianero, et al, Chem. Biodiversity, 2009, 6, 1374

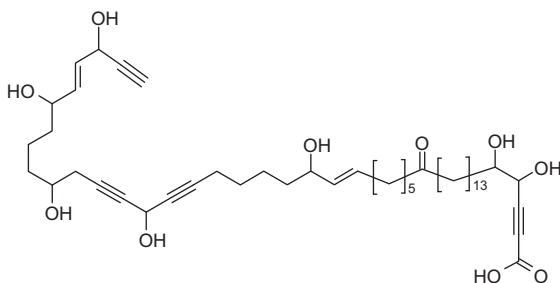
**309 Osirisyne A**

**Type:** Acetylenic acids and esters.  $C_{47}H_{72}O_{11}$  Solid, mp 118–120 °C,  $[\alpha]_D^{25} = +11.8^\circ$  ( $c = 0.15$ , MeOH). **Source:** Sponge *Haliclona osiris* (Korea waters). **Pharm:** Cytotoxic (K562,  $LC_{50} = 25 \mu\text{mol/L}$ ). **Ref:** J. Shin, et al, Tetrahedron, 1998, 54, 8711

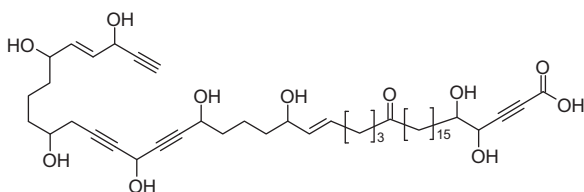


**310 Osirisyne B**

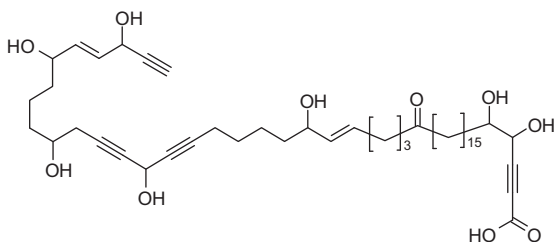
**Type:** Acetylenic acids and esters.  $C_{47}H_{72}O_{10}$  Solid, mp 123–124 °C,  $[\alpha]_D^{25} = +16.1^\circ$  ( $c = 0.12$ , MeOH). **Source:** Sponge *Haliclona osiris* (Korea waters). **Pharm:** Cytotoxic (K562,  $LC_{50} = 48 \mu\text{mol/L}$ ). **Ref:** J. Shin, et al, Tetrahedron, 1998, 54, 8711

**311 Osirisyne C**

**Type:** Acetylenic acids and esters.  $C_{47}H_{72}O_{11}$  Solid, mp 121–122 °C,  $[\alpha]_D^{25} = +13.4^\circ$  ( $c = 0.17$ , MeOH). **Source:** Sponge *Haliclona osiris* (Korea waters). **Pharm:** Cytotoxic (K562,  $LC_{50} = 52 \mu\text{mol/L}$ ); Na/K-ATPase and reverse transcriptase (RT) inhibitor, 1  $\mu\text{g}/10 \mu\text{L}$ . **Ref:** J. Shin, et al, Tetrahedron, 1998, 54, 8711

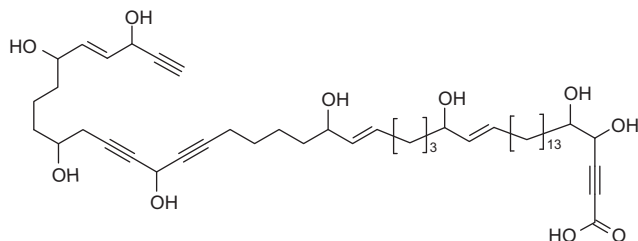
**312 Osirisyne D**

**Type:** Acetylenic acids and esters.  $C_{47}H_{72}O_{10}$  Solid, mp 138–140 °C,  $[\alpha]_D^{25} = +10.3^\circ$  ( $c = 0.12$ , MeOH). **Source:** Sponge *Haliclona osiris* (Korea waters). **Pharm:** Cytotoxic (K562,  $LC_{50} = 25 \mu\text{mol/L}$ ). **Ref:** J. Shin, et al, Tetrahedron, 1998, 54, 8711

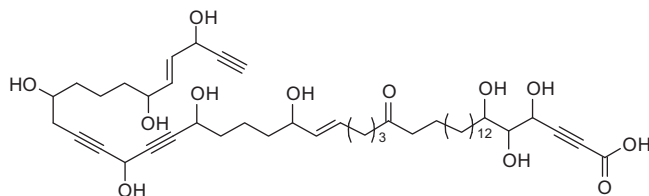


**313 Osirisyne E**

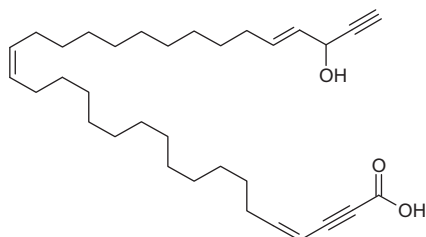
**Type:** Acetylenic acids and esters.  $C_{47}H_{72}O_{10}$  Solid, mp 126–128 °C,  $[\alpha]_D^{25} = +18.5^\circ$  ( $c = 0.10$ , MeOH). **Source:** Sponge *Haliclona osiris* (Korea waters). **Pharm:** Cytotoxic (K562,  $LC_{50} = 20 \mu\text{mol/L}$ ; Na/K-ATPase and reverse transcriptase (RT) inhibitor,  $1 \mu\text{g}/10 \mu\text{L}$ ). **Ref:** J. Shin, et al, Tetrahedron, 1998, 54, 8711

**314 Osirisyne F**

**Type:** Acetylenic acids and esters.  $C_{47}H_{72}O_{12}$  Solid, mp 138–140 °C,  $[\alpha]_D^{25} = +6.8^\circ$  ( $c = 0.09$ , MeOH). **Source:** Sponge *Haliclona osiris* (Korea waters). **Pharm:** Cytotoxic (K562,  $LC_{50} = 20 \mu\text{mol/L}$ ; Na/K-ATPase and reverse transcriptase (RT) inhibitor,  $1 \mu\text{g}/10 \mu\text{L}$ ). **Ref:** J. Shin, et al, Tetrahedron, 1998, 54, 8711

**315 Pellynic acid**

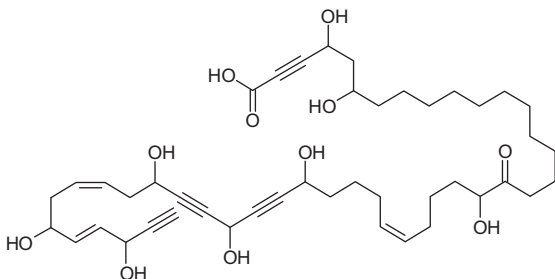
**Type:** Acetylenic acids and esters.  $C_{33}H_{52}O_3$  Gum,  $[\alpha]_D = -10.5^\circ$  ( $c = 0.34$ ,  $\text{CHCl}_3/\text{MeOH}$ , 1:1). **Source:** Sponge *Pellina triangulate* (Chuuk Atoll, Federated States of Micronesia). **Pharm:** IMPDH inhibitor ( $IC_{50} = 1.03 \mu\text{mol/L}$ ). **Ref:** X. Fu, et al, Tetrahedron, 1997, 53, 799



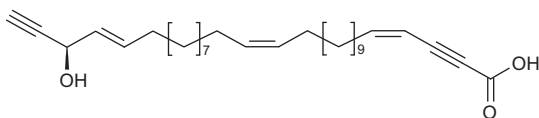


**316 Petrosolic acid**

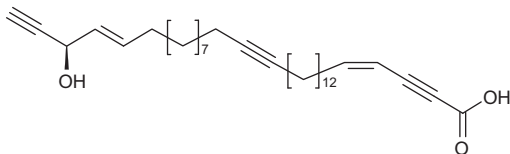
Type: Acetylenic acids and esters.  $C_{44}H_{64}O_{11}$  Amorph. powder,  $[\alpha]_D^{22} = +7^\circ$  ( $c = 2.9$ , MeOH). Source: Sponge *Petrosia* sp. (Red Sea). Pharm: HIV reverse transcriptase inhibitor. Ref: S. Isaacs, et al, Tetrahedron, 1993, 49, 10435

**317 Petrosynic acid A**

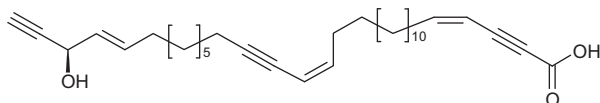
Type: Acetylenic acids and esters.  $C_{31}H_{48}O_3$  Source: Sponge *Petrosia* sp. (Tutuila, American Samoa). Pharm: Cytotoxic (various HTCLs and non-proliferative hmn fibroblasts, hence no therapeutic window is available). Ref: E. J. Mejia, et al, JNP, 2013, 76, 425

**318 Petrosynic acid B**

Type: Acetylenic acids and esters.  $C_{33}H_{50}O_3$  Source: Sponge *Petrosia* sp. (Tutuila, American Samoa). Pharm: Cytotoxic (various HTCLs and non-proliferative hmn fibroblasts, hence no therapeutic window is available). Ref: E. J. Mejia, et al, JNP, 2013, 76, 425

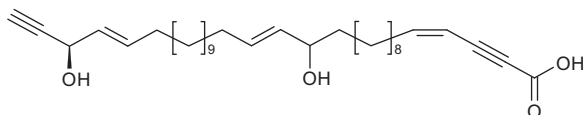
**319 Petrosynic acid C**

Type: Acetylenic acids and esters.  $C_{33}H_{48}O_3$  Source: Sponge *Petrosia* sp. (Tutuila, American Samoa). Pharm: Cytotoxic (various HTCLs and non-proliferative hmn fibroblasts, hence no therapeutic window is available). Ref: E. J. Mejia, et al, JNP, 2013, 76, 425



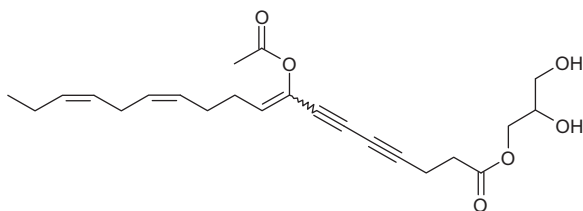
### 320 Petrosynic acid D

**Type:** Acetylenic acids and esters.  $C_{33}H_{52}O_4$  **Source:** Sponge *Petrosia* sp. (Tutuila, American Samoa). **Pharm:** Cytotoxic (various HTCLs and non-proliferative hmn fibroblasts, hence no therapeutic window is available). **Ref:** E. J. Mejia, et al, JNP, 2013, 76, 425



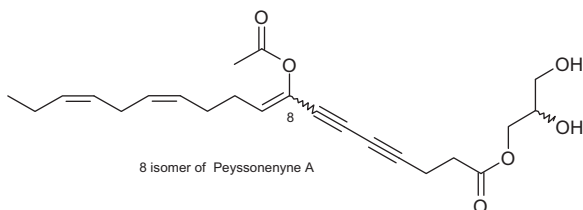
### 321 Peyssonenyne A

**Type:** Acetylenic acids and esters.  $C_{23}H_{30}O_6$  Oil. **Source:** Red alga *Peyssonnelia caulifera*. **Pharm:** DNA methyltransferase inhibitor. **Ref:** K. L. McPhail, et al, JNP, 2004, 67, 1010



### 322 Peyssonenyne B

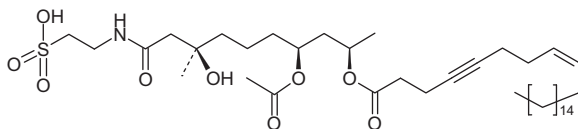
**Type:** Acetylenic acids and esters.  $C_{23}H_{30}O_6$  Oil. **Source:** Red alga *Peyssonnelia caulifera*. **Pharm:** DNA methyltransferase inhibitor. **Ref:** K. L. McPhail, et al, JNP, 2004, 67, 1010



### 323 Taurospongina A

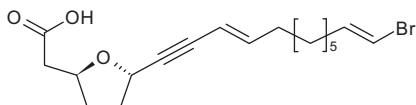
**Type:** Acetylenic acids and esters.  $C_{40}H_{71}NO_9S$  Amorph. solid,  $[\alpha]_D^{27} = +2.4^\circ$  ( $c = 0.2$ , MeOH). **Source:** Sponge *Hippospongia* sp. (Okinawa). **Pharm:** DNA polymerase

$\beta$  inhibitor ( $IC_{50} = 7.0 \mu\text{mol/L}$ ); HIV reverse transcriptase inhibitor ( $IC_{50} = 6.5 \mu\text{mol/L}$ ). Ref: H. Ishiyama, et al, JOC, 1997, 62, 3831



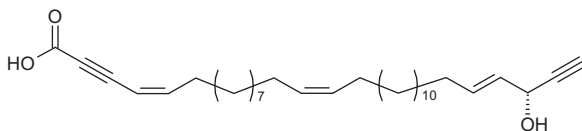
### 324 Testafuran A

Type: Acetylenic acids and esters.  $C_{18}H_{25}BrO_3$  Source: Sponge *Xestospongia testudinaria* (Iwo I., Kagoshima, Japan). Pharm: Induces adipogenesis (stimulation of differentiation of preadipocytes to adipocytes, so may acts as leads for treatment of cardiovascular disorders). Ref: T. Akiyama, et al, Tetrahedron, 2013, 69, 6560



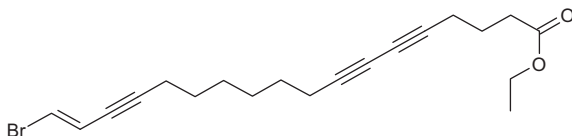
### 325 Triangulynic acid

Type: Acetylenic acids and esters.  $C_{33}H_{52}O_3$  Oil,  $[\alpha]_D = -12.9^\circ$  ( $c = 1.2$ ,  $CHCl_3$ ). Source: Sponge *Pellina triangulata* (Truk, Federated States of Micronesia). Pharm: Cytotoxic (less potent than Triangulynes A–H and did not exhibit differential cytotoxicity). Ref: J. -R. Dai, et al, JNP, 1996, 59, 860



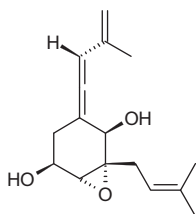
### 326 Xestospongic acid ethyl ester

Type: Acetylenic acids and esters.  $C_{20}H_{25}BrO_2$  Pale yellow oil. Source: Sponge *Xestospongia testudinaria* (Mayotte). Pharm: Na/K-ATPase inhibitor ( $ID_{50} = 0.1\text{--}1.0 \mu\text{mol/L}$ ); antibacterial (*Staphylococcus aureus*,  $IZD = 15 \text{ mm}$  at  $500 \mu\text{g/disk}$ , weak). Ref: M. L. Bourguet-Kondracki, et al, Tet. Lett., 1992, 33, 225

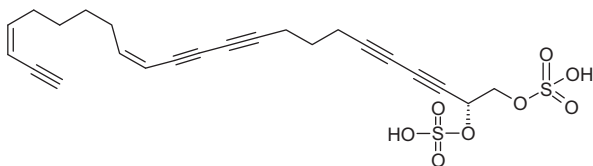


**327 A82775C enantiomer**

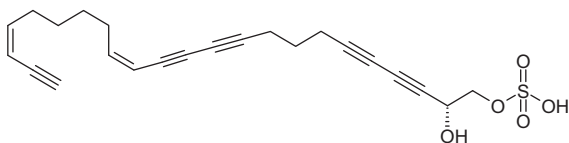
Type: Allenes.  $C_{16}H_{22}O_3$  Source: Marine-derived fungus *Phaeosphaeria spartinae* from red alga *Ceramium* sp. (Germany). Pharm: HLE inhibitor. Ref: M. F. Elsebai, et al, Nat. Prod. Commun., 2010, 5, 1071

**1.4 Miscellaneous acetylenes****328 Callyspongin A**

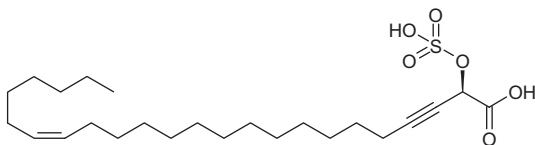
(2R,14Z,20Z)-14,20-Tricosadiene-3,5,10,12,22-pentayne-1,2-diol-di-O-sulfate Type: Miscellaneous acetylenes.  $C_{23}H_{24}O_8S_2$   $[\alpha]_D^{25} = -40.3^\circ$  ( $c = 1$ ,  $H_2O$ ). Source: Sponge *Callyspongia truncata*. Pharm: Inhibits fertilization of starfish *Asterias amurensis* gametes. Ref: M. Uno, et al, JNP, 1996, 59, 1146

**329 Callyspongin B**

Type: Miscellaneous acetylenes.  $C_{23}H_{24}O_5S$   $[\alpha]_D^{25} = +3.1^\circ$  ( $c = 0.4$ , DMSO). Source: Sponge *Callyspongia truncata* (Japan waters). Pharm: Inhibits fertilization of starfish *Asterias amurensis* gametes. Ref: M. Uno, et al, JNP, 1996, 59, 1146

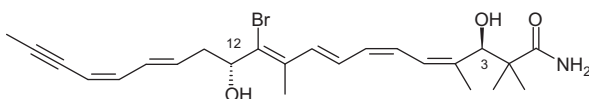
**330 Callysponginol sulfate A**

Type: Miscellaneous acetylenes.  $C_{24}H_{42}O_6S$  Powder,  $[\alpha]_D^{24} = -0.2^\circ$  ( $c = 0.1$ , MeOH). Source: Sponge *Callyspongia truncata*. Pharm: Membrane type 1 matrix metalloproteinase inhibitor. Ref: M. Fujita, et al, JNP, 2003, 66, 569



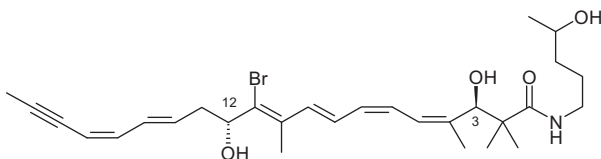
### 331 Clathrynamide A

11-Bromo-3,12-dihydroxy-2,2,4,10-tetramethyl-4,6,8,10,14,16-eicosahexaen-18-ynamide  
Type: Miscellaneous acetylenes.  $C_{24}H_{32}BrNO_3$  Pale yellow oil,  $[\alpha]_D^{23} = +149^\circ$   
 ( $c = 0.022$ , MeOH). Source: Sponge *Clathria* sp. (Japan waters). Pharm: Cell division  
 Inhibitor (fertilized starfish eggs). Ref: S. Ohta, et al, Tet. Lett., 1993, 34, 5935



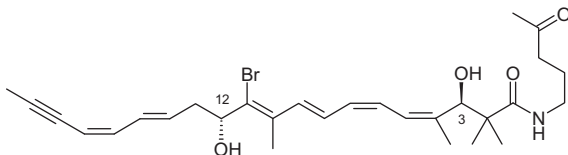
### 332 Clathrynamide B

Type: Miscellaneous acetylenes.  $C_{30}H_{44}BrNO_4$  Gum,  $[\alpha]_D^{25} = +76^\circ$  ( $c = 0.0033$ ,  
 MeOH). Source: Sponge *Clathria* sp. (Japan waters). Pharm: Cell division Inhibitor  
 (fertilized starfish eggs). Ref: S. Ohta, et al, Tet. Lett., 1993, 34, 5935



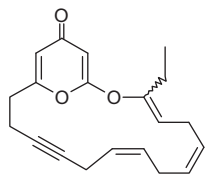
### 333 Clathrynamide C

Type: Miscellaneous acetylenes.  $C_{30}H_{42}BrNO_4$  Gum. Source: Sponge *Clathria* sp.  
 (Japan waters). Pharm: Cell division Inhibitor (fertilized starfish eggs). Ref: S. Ohta,  
 et al, Tet. Lett., 1993, 34, 5935



### 334 (12Z,15Z)-19-Ethyl-2,6-epoxy-1-oxacyclononadeca-2,5,12,15,18-pentaen-9-yn-4-one

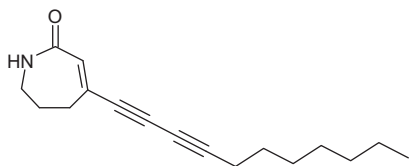
Type: Miscellaneous acetylenes.  $C_{20}H_{22}O_3$  Oil. Source: Red alga *Phaxcelocarpus la-*  
*billardieri*. Pharm: Neuromuscular blocker. Ref: R. Kazlauskas, et al, Aust. J. Chem.,  
 1982, 35, 113 | L. Murray, et al, Aust. J. Chem., 1995, 48, 1485



### 335 Montiporyne E

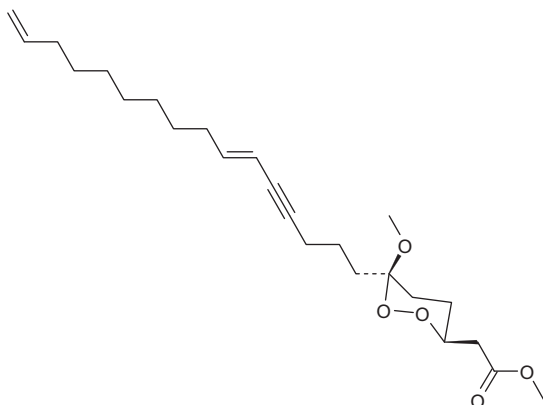
**Type:** Miscellaneous acetylenes.  $C_{17}H_{23}NO$  Pale yellow gum. **Source:** Stony coral *Montipora* sp. (along shore of Mundo, Cheju, Korea, depth of 8 m, on Nov. 4, 1996).

**Pharm:** Cytotoxic (hmn solid carcinoma cells *in vitro*: A549  $ED_{50} > 50 \mu\text{g/mL}$ , SK-OV-3  $ED_{50} > 50 \mu\text{g/mL}$ , SK-MEL-2  $ED_{50} > 50 \mu\text{g/mL}$ , XF498  $ED_{50} > 50 \mu\text{g/mL}$ , HCT15  $ED_{50} > 50 \mu\text{g/mL}$ ; control Cisplatin,  $ED_{50} = 0.8 \mu\text{g/mL}$ ,  $1.2 \mu\text{g/mL}$ ,  $1.5 \mu\text{g/mL}$ ,  $0.7 \mu\text{g/mL}$ , and  $1.5 \mu\text{g/mL}$  respectively). **Ref:** B. H. Bae, et al, JNP, 2000, 63, 1511



### 336 Peroxyacarnic acid A

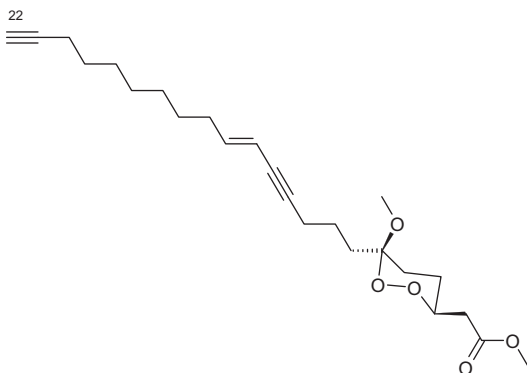
6-(6,15-Hexadecadien-4-ynyl)-6-methoxy-1,2-dioxane-3-acetic acid **Type:** Miscellaneous acetylenes.  $C_{24}H_{38}O_5$  Oil (Me ester),  $[\alpha]_D = -26^\circ$  ( $c = 0.2$ ,  $\text{CHCl}_3$ ) (Me ester). **Source:** Sponge *Acarinus* cf. *bergquistae* (Eritrea). **Pharm:** Cytotoxic ( $P_{388}$ , A549, and HT29,  $IC_{50} = 0.1 \mu\text{g/mL}$ ). **Ref:** T. Yosief, et al, JNP, 1998, 61, 491



### 337 Peroxyacarnic acid B

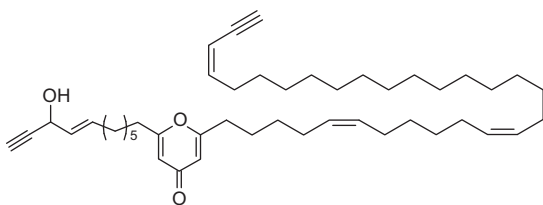
6-(6-Hexadecene-4,15-diynyl)-6-methoxy-1,2-dioxane-3-acetic acid **Type:** Miscellaneous acetylenes.  $C_{24}H_{36}O_5$  Oil (Me ester),  $[\alpha]_D = -26^\circ$  ( $c = 0.2$ ,  $\text{CHCl}_3$ ) (Me ester). **Source:**

Sponge *Acarus* cf. *bergquistae* (Eritrea). Pharm: Cytotoxic (P<sub>388</sub>, A549, and HT29, IC<sub>50</sub> = 0.1 µg/mL). Ref: T. Yosief, et al, JNP, 1998, 61, 491



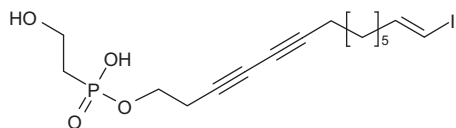
### 338 Petrocortyne C

Type: Miscellaneous acetylenes. C<sub>46</sub>H<sub>70</sub>O<sub>3</sub> [α]<sub>D</sub><sup>25</sup> = +6.2° (c = 0.25, MeOH). Source: Sponge *Petrosia* sp. (Korea waters). Pharm: DNA replication inhibitor (simian virus SV40, 125 µmol/L, InRt = 89%, 250 µmol/L, InRt = 100%, 500 µmol/L, InRt = 100%) (Lim, 2001); cytotoxic (A549, ED<sub>50</sub> > 10 µg/mL; SK-OV-3, ED<sub>50</sub> = 0.7 µg/mL; SK-MEL-2, ED<sub>50</sub> = 2.4 µg/mL; XF498, ED<sub>50</sub> > 10 µg/mL; HCT15, ED<sub>50</sub> = 7.5 µg/mL; control Cisplatin, A549, ED<sub>50</sub> = 0.6 µg/mL; SK-OV-3, ED<sub>50</sub> = 0.9 µg/mL; SK-MEL-2, ED<sub>50</sub> = 0.7 µg/mL; XF498, ED<sub>50</sub> = 0.6 µg/mL; HCT15, ED<sub>50</sub> = 0.6 µg/mL) (Lim, 2001); RNA-cleaving activity; PLA<sub>2</sub> inhibitor; Na<sup>+</sup>/K<sup>+</sup> ATPase inhibitor; toxic (lethality to brine shrimp). Ref: Y. Seo, et al, Tetrahedron, 1998, 54, 447 | J. Shin, et al, JNP, 1998, 61, 1268 | Y. J. Lim, et al, JNP, 2001, 64, 46



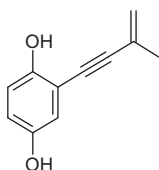
### 339 Phosphoiodyd A

Type: Miscellaneous acetylenes. C<sub>16</sub>H<sub>24</sub>IO<sub>4</sub>P Source: Sponge *Placospongia* sp. (Tong-Yeung City, South Korea). Pharm: hPPARδ (hmn peroxisome proliferator-activated receptor δ) inhibitor (potent, with 200-fold selectivity over other PPARs, a potent regulator of lipid and glucose metabolism, and potentially a lead for treating type 2 diabetes or metabolic disorders). Ref: H. Kim, et al, Org. Lett., 2013, 15, 100 | H. Kim, et al, Org. Lett., 2013, 15, 5614



### 340 Siccayne

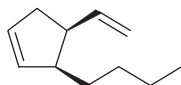
2-(3-Methyl-3-buten-1-ynyl)-1,4-benzenediol Type: Miscellaneous acetylenes.  $C_{11}H_{10}O_2$  Cryst. ( $C_6H_6$ ), mp 115–116 °C. Source: Marine-derived fungus (basidiomycete) *Halocyphina villosa*. Pharm: Antibacterial (gram-positive bacteria); antifungal. Ref: J. Kupka, et al, J. Antibiot., 1981, 34, 298



## 1.5 Monocarbocyclic Compounds

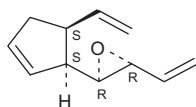
### 341 (+)-(3*S*,4*S*)-3-*n*-Butyl-4-vinylcyclopentene

Type: Monocarbocyclic alkanes.  $C_{11}H_{18}$   $[\alpha]_D^{20} = -17^\circ$  ( $c = 0.909$ , pentane). Source: Brown algae *Dictyopteris prolifera* (Japan waters) and *Chorda tomentosa*. Pharm: Sperm attractant (pheromone). Ref: I. Maier, et al, Naturwissenschaften, 1984, 71, 48 | T. Kajiwara, et al, Phytochemistry, 1997, 45, 529



### 342 Caudoxirene

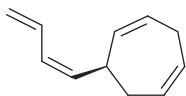
Type: Monocarbocyclic alkanes.  $C_{11}H_{14}O$  Oil,  $[\alpha]_D = +238.3^\circ$  ( $CH_2Cl_2$ ). Source: Brown alga *Perithalia caudata*. Pharm: Gamete releasing factor (threshold conc. = 30 pmol/L). Ref: D. G. Müller, et al, Biol. Chem. Hoppe-Seyler, 1988, 369, 655 | D. Wirth, et al, Helv. Chim. Acta, 1992, 75, 751



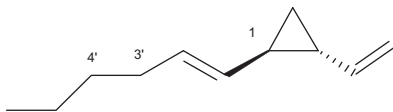


**343 Desmarestene**

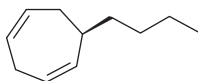
6-(1,3-Butadienyl)-1,4-cycloheptadiene Type: Monocarbocyclic alkanes.  $C_{11}H_{14}$   $[\alpha]_D^{22} = +168^\circ$  ( $c = 1.4$ ,  $CH_2Cl_2$ ). Source: Brown algae *Desmarestia aculeata*, *Desmarestia firma* and *Desmarestia viridis*. Pharm: Attractant (gamete-releasing and gamete-attracting pheromone of *Desmarestia aculeata* and *Desmarestia Firma*). Ref: D. G. Müller, et al, Naturwissenschaften, 1982, 69, 290 | S. Pantke-Böcker, et al, Tetrahedron, 1995, 51, 7927

**344 Dictyoptere A**

Type: Monocarbocyclic alkanes.  $C_{11}H_{18}$  Oil,  $[\alpha]_D^{21} = +77^\circ$  ( $c = 0.5$ , EtOH). Source: Brown algae *Dictyopteris* spp. and *Spermatochnus paradoxus*. Pharm: Gamete attractant. Ref: J. A. Pettus, et al, J. Chem. Soc., Chem. Commun., 1970, 1093 | R. E. Moore, et al, JOC, 1974, 39, 2201 | D. G. Müller, et al, R. E. Moore, acc. Chem. Res., 1977, 10, 40 | J. Buckingham (executive editor), et al, Dictionary of Natural Products, Vol 8, first supplement, pp238, 1995, Champman & Hall.London | T. Itoh, et al, Bull. Chem. Soc. Jpn., 2000, 73, 409

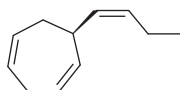
**345 (R)-Dictyoptere C'**

6-Butyl-1,4-cycloheptadiene; Dictyotene Type: Monocarbocyclic alkanes.  $C_{11}H_{18}$  Oil,  $[\alpha]_D^{25} = -13^\circ$  ( $c = 7.32$ ,  $CHCl_3$ ). Source: Brown algae *Dictyota dichotoma* and *Dictyopteris* spp. Pharm: Sperm attractant. (spermatozoa of algae). Ref: J. A. Pettus, et al, JACS, 1971, 93, 3087 | R. E. Moore, et al, JOC, 1974, 39, 2201 | D. G. Müller, et al, Science, 1981, 212, 1040 | D. Wirth, et al, Helv. Chim. Acta, 1992, 75, 734 | H. Imogai, et al, Helv. Chim. Acta, 1998, 81, 1754

**346 Ectocarpene**

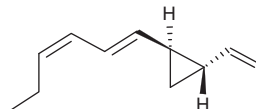
Type: Monocarbocyclic alkanes.  $C_{11}H_{16}$   $[\alpha]_D^{25} = +75^\circ$  ( $c = 0.15$ ,  $CH_2Cl_2$ ). Source: Brown algae *Ectocarpus siliculosus*, *Cutleria multifida*, *Desmarestia viridis* and *Chorda tomentosa*. Pharm: Gamete attractant (pheromone of *Ectocarpus siliculosus*).

Ref: D. G. Müller, et al, Science, 1971, 171, 815 | L. Jaenicke, et al, JACS, 1974, 96, 3324 | D. G. Müller, et al, Naturwissenschaften, 1982, 69, 290 | I. Maier, et al, Naturwissenschaften, 1984, 71, 48 | W. Bol, et al, Helv. Chim. Acta, 1984, 67, 616 | W. Boland, et al, Angew. Chem., Int. Ed. Eng., 1995, 34, 1602 | G. Pohnert, et al, Tetrahedron, 1997, 53, 13681



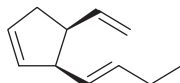
### 347 Hormosirene

Type: Monocarbocyclic alkanes.  $C_{12}H_{18}$  Oil,  $bp_{0.3mmHg}$  62 °C,  $[\alpha]_D^{24} = -43^\circ$  ( $c = 10.1$ ,  $CHCl_3$ ). Source: Brown algae *Ectocarpus siliculosus* and *Hormosira banksii*. Pharm: Sperm attractant. Ref: D. G. Müller, et al, Naturwissenschaften, 1985, 72, 97 | G. Pohnert, et al, Tetrahedron, 1997, 53, 13681



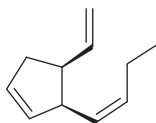
### 348 (+)-(E)-(3S,4S)-Multifidene

Type: Monocarbocyclic alkanes.  $C_{11}H_{16}$   $[\alpha]_D^{20} = -246^\circ$  ( $c = 1.76$ ,  $CHCl_3$ ). Source: Brown algae (various). Pharm: Pheromone (constituent of various brown algal pheromones). Ref: W. Wirth, et al, Helv. Chim. Acta, 1992, 75, 734



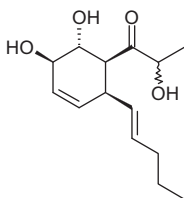
### 349 (+)-(Z)-(3S,4S)-Multifidene

Type: Monocarbocyclic alkanes.  $C_{11}H_{16}$   $[\alpha]_D^{20} = +261^\circ$  ( $c = 0.82$ ,  $CCl_4$ );  $[\alpha]_D^{23.5} = +28^\circ$  ( $c = 0.0036$ ,  $CHCl_3$ ). Source: Brown algae *Cutleria multifida*, *Chorda tomentosa* and various brown algae. Pharm: Pheromone (constituent of various brown algal pheromones). Ref: L. Jaenicke, et al, JACS, 1974, 96, 3324 | L. Jaenicke, et al, Angew. Chem., Int. Ed. Eng., 1982, 21, 643 | I. Maier, et al, Naturwissenschaften, 1984, 71, 48 | J. E. Burks, Jr., et al, JOC, 1984, 49, 4663 | W. Bol, et al, Helv. Chim. Acta, 1984, 67, 616 | P. Kramp, et al, J. Chem. Soc., Chem. Commun., 1993, 551 | S. Hemamalini, et al, Helv. Chim. Acta, 1995, 78, 447



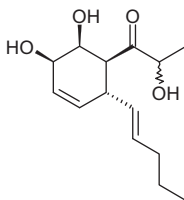
### 350 Nigrosporane A

**Type:** Monocarbocyclic alkanes.  $C_{14}H_{22}O_4$  **Source:** Marine-derived fungus *Nigrospora* sp. PSU-F11 from gorgonian sea fan *Annella* sp. (Thailand). **Pharm:** Cytotoxic (MCF7,  $IC_{50} = 9.37 \mu\text{g/mL}$ ; Vero,  $IC_{50} = 5.42 \mu\text{g/mL}$ ); antioxidant (DPPH scavenger,  $IC_{50} = 0.34 \text{ mg/mL}$ , control 2,6-Di-tert-butyl-4-methylphenol,  $IC_{50} = 0.02 \text{ mg/mL}$ ). **Ref:** V. Rukachaisirikul, et al, Arch. Pharmacol Res., 2010, 33, 375



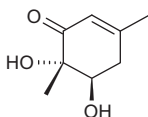
### 351 Nigrosporane B

**Type:** Monocarbocyclic alkanes.  $C_{14}H_{22}O_4$  **Source:** Marine-derived fungus *Nigrospora* sp. PSU-F11 from gorgonian sea fan *Annella* sp. (Thailand). **Pharm:** Antioxidant (DPPH scavenger,  $IC_{50} = 0.24 \text{ mg/mL}$ , control 2,6-Di-tert-butyl-4-methylphenol,  $IC_{50} = 0.02 \text{ mg/mL}$ ). **Ref:** V. Rukachaisirikul, et al, Arch. Pharmacol Res., 2010, 33, 375



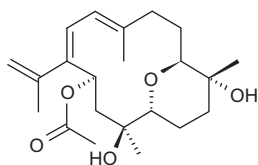
### 352 Leptosphaerone C

**Type:** Monocarbocyclic alcohols.  $C_8H_{12}O_3$  Oil,  $[\alpha]_D^{25} = -0.8^\circ$  ( $c = 0.3$ , MeOH). **Source:** Mangrove-derived fungus *Penicillium* sp. JP-1 from mangrove *Aegiceras corniculatum* (China waters). **Pharm:** Cytotoxic (MTT assay, A549,  $IC_{50} = 1.45 \mu\text{mol/L}$ ). **Ref:** Z. J. Lin, et al, Phytochemistry, 2008, 69, 1273

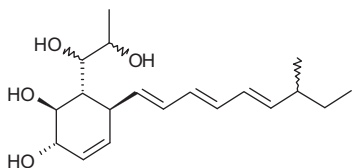


**353 Lobophytone T**

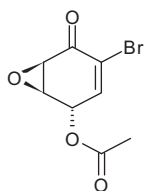
**Type:** Monocarbocyclic alcohols.  $C_{22}H_{34}O_5$  Colorless oil,  $[\alpha]_D^{25} = +36.5^\circ$  ( $c = 0.27$ ,  $CHCl_3$ ). **Source:** Soft coral *Lobophytum pauciflorum* (Sanya Bay, Hainan, China). **Pharm:** LPS-induced NO production inhibitor (mouse peritoneal macrophages,  $IC_{50} > 10 \mu\text{mol/L}$ , weak); cytotoxic (mouse peritoneal macrophages,  $IC_{50} > 10 \mu\text{mol/L}$ , weak); antibacterial (*Staphylococcus aureus*, *Staphylococcus pneumoniae* and *Saccharomyces cerevisiae*,  $20 \mu\text{g/mL}$ , InRt = 90%; *Pseudomonas aeruginosa* and *Escherichia coli*, weak); antifungal (*Candida albicans* and *Aspergillus fumigatus*, weak). **Ref:** P. Yan, et al, Mar. Drugs, 2010, 8, 2837

**354 Spartinol C**

**Type:** Monocarbocyclic alcohols.  $C_{19}H_{30}O_4$  Yellow-brown powder,  $[\alpha]_D^{24} = -55^\circ$  ( $c = 0.28$ ,  $Me_2CO$ ). **Source:** Marine-derived fungus *Phaeosphaeria spartinae* 777 (endophyte) from red alga *Ceramium* sp. (North Sea, Büsum, Germany). **Pharm:** HLE inhibitor ( $IC_{50} = 17.7 \mu\text{g/mL}$ , weak). **Ref:** M. F. Elsebai, et al, Nat. Prod. Commun., 2009, 4, 1463

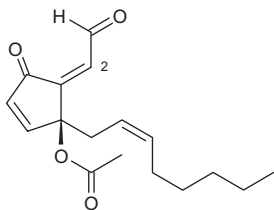
**355 4-Acetoxy-2-bromo-5,6-epoxy-2-cyclohexen-1-one**

**Type:** Monocarbocyclic aldehydes and ketones.  $C_8H_7BrO_4$  Needles (EtOAc/hexane), mp 93–94 °C,  $[\alpha]_D^{19} = +265^\circ$ , ( $c = 0.12$ ,  $CHCl_3$ ). **Source:** Hemichordate acorn worm *Ptychodera* sp. **Pharm:** Antineoplastic. **Ref:** T. Higa, et al, Tetrahedron, 1987, 43, 1063 | J. M. Corgiat, et al, Comp. Biochem. Physiol., B: Comp. Biochem., 1993, 106, 83

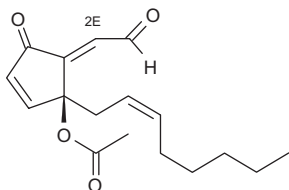


**356 Clavirin I**

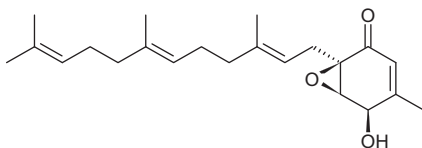
**Type:** Monocarbocyclic aldehydes and ketones.  $C_{17}H_{22}O_4$  Oil,  $[\alpha]_D^{25} = -17.1^\circ$  ( $c = 0.48$ ,  $CHCl_3$ ). **Source:** Soft coral *Clavularia viridis* (Okinawa). **Pharm:** Cell growth Inhibitor (HeLa-S3 cells). **Ref:** M. Iwashima, et al, Tet. Lett., 1999, 40, 6455

**357 Clavirin II**

**Type:** Monocarbocyclic aldehydes and ketones.  $C_{17}H_{22}O_4$  Oil,  $[\alpha]_D^{25} = -33.7^\circ$  ( $c = 0.43$ ,  $CHCl_3$ ). **Source:** Soft coral *Clavularia viridis* (Okinawa). **Pharm:** Cell growth Inhibitor (HeLa-S3 cells). **Ref:** M. Iwashima, et al, Tet. Lett., 1999, 40, 6455

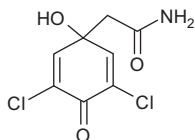
**358 22-Deacetoxyanuthone A**

7-Deacetoxyanuthone A **Type:** Monocarbocyclic aldehydes and ketones.  $C_{22}H_{32}O_3$  Yellow oil,  $[\alpha]_D = +3.1^\circ$  ( $c = 0.5$ ,  $CHCl_3$ ). **Source:** Marine-derived fungus *Penicillium* sp. **Pharm:** Cytotoxic (*in vitro*, a panel of 5 hmn tumor cell lines, moderate); antibacterial (*in vitro*, methicillin-resistant and multidrug-resistant *Staphylococcus aureus*, MIC = 50  $\mu\text{g/mL}$ ). **Ref:** X. Li, et al, JNP, 2003, 66, 1499 | M. Saleem, et al, NPR, 2007, 24, 1142 (rev)

**359 Dichloroverongiaquinol**

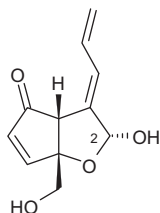
**Type:** Monocarbocyclic aldehydes and ketones.  $C_8H_7Cl_2NO_3$  Cryst., mp 162–163 °C. **Source:** Sponges *Aplysina cavernicola* and *Aplysina fistularis* (Mediterranean Sea).

**Pharm:** Antibacterial (gram-positive and gram-negative bacteria). **Ref:** Y. M. Goo, et al, Arch. Pharmacol Res., 1985, 8, 21



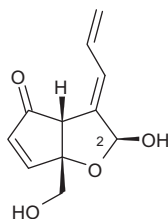
### 360 Didemnenone A

**Type:** Monocarbocyclic aldehydes and ketones.  $C_{11}H_{12}O_4$  **Source:** Ascidians *Trididemnum cyanophorum* and *Didemnum voeltzkowi*. **Pharm:** Antifungal (pathogenic marine fungus *Lagenidium callinectes*); antibacterial (variety of microorganisms). **Ref:** N. Lindquist, et al, JACS, 1988, 110, 1308 | C. J. Forsyth, et al, JACS, 1988, 110, 5911



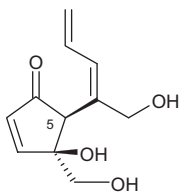
### 361 Didemnenone B

**Type:** Monocarbocyclic aldehydes and ketones.  $C_{11}H_{12}O_4$  **Source:** Ascidian *Trididemnum cyanophorum*. **Pharm:** Antifungal (pathogenic marine fungus *Lagenidium callinectes*); antibacterial (variety of microorganisms). **Ref:** N. Lindquist, et al, JACS, 1988, 110, 1308 | C. J. Forsyth, et al, JACS, 1988, 110, 5911



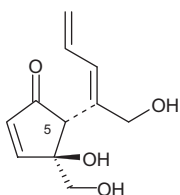
### 362 Didemnenone C

4-Hydroxy-4-(hydroxymethyl)-5-[1-(hydroxymethyl)-1,3-butadienyl]-2-cyclopenten-1-one **Type:** Monocarbocyclic aldehydes and ketones.  $C_{11}H_{14}O_4$   $[\alpha]_D = -25.3^\circ$  ( $c = 0.08$ , MeOH). **Source:** Ascidian *Didemnum voeltzkowi*. **Pharm:** Cytotoxic ( $L_{1210}$ ,  $IC_{50} = 5.6 \mu\text{g/mL}$ ). **Ref:** N. Lindquist, et al, JACS, 1988, 110, 1308 | T. Sugahara, et al, CPB, 1995, 43, 147



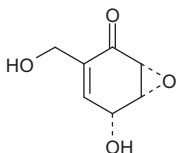
### 363 Didemnenone D

**Type:** Monocarbocyclic aldehydes and ketones.  $C_{11}H_{14}O_4$   $[\alpha]_D = -12.6^\circ$  ( $c = 0.15$ , MeOH). **Source:** Ascidian *Didemnum voeltzkowi*. **Pharm:** Cytotoxic ( $L_{1210}$ ,  $IC_{50} = 5.6 \mu\text{g/mL}$ ). **Ref:** N. Lindquist, et al, JACS, 1988, 110, 1308 | T. Sugahara, et al, CPB, 1995, 43, 147



### 364 (+)-Epoxydon

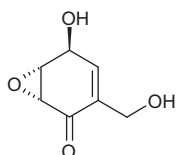
5-Hydroxy-3-(hydroxymethyl)-7-oxabicyclo[4.1.0]hept-3-en-2-one **Type:** Monocarbocyclic aldehydes and ketones.  $C_7H_8O_4$  Cryst. ( $\text{Me}_2\text{CO}/\text{Et}_2\text{O}$ ), mp 40–45 °C,  $[\alpha]_D^{22} = +93^\circ$  ( $c = 0.29$ , MeOH). **Source:** Marine-derived fungi *Nigrospora* sp. PSU-F5 from gorgonian sea fan *Annella* sp. (Thailand) and *Aspergillus parasiticus*, terrestrial fungi *Phoma* spp. **Pharm:** Antibacterial (*Staphylococcus aureus* ATCC 25923, MIC = 128  $\mu\text{g/mL}$ , MRSA, MIC = 128  $\mu\text{g/mL}$ ); antioxidant (free radicals scavenger: DPPH radical,  $IC_{50} = 57.0 \mu\text{g/mL}$ , ONOO<sup>-</sup> radical,  $IC_{50} = 52.6 \mu\text{g/mL}$ , O<sub>2</sub><sup>•-</sup> radical, NO<sup>•</sup> radical); antibacterial. **Ref:** A. Closse, et al, Helv. Chim. Acta, 1966, 49, 204 | B. W. Son, et al, JNP, 2002, 65, 794 | G. Mehta, et al, Tet. Lett., 2005, 46, 3373 | M. Saleem, et al, NPR, 2007, 24, 1142 (rev) | K. Trisuwan, et al, JNP, 2008, 71, 1323



### 365 (+)-epi-Epoxydon

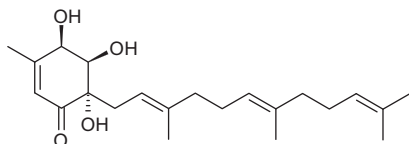
**Type:** Monocarbocyclic aldehydes and ketones.  $C_7H_8O_4$  Cryst.,  $[\alpha]_D^{24} = +194^\circ$  ( $c = 1.57$ , EtOH),  $[\alpha]_D^{25} = +261^\circ$  ( $c = 1$ , MeOH), **Source:** Marine-derived fungus *Penicillium* sp. OUPS-79 from green alga *Enteromorpha intestinalis*. **Pharm:** Cytotoxic ( $P_{388}$ ,

ED<sub>50</sub> = 0.2 µg/mL). Ref: T. Nagata, et al, Biosci., Biotechnol., Biochem., 1992, 56, 810 | C. Iwamoto, et al, Tetrahedron, 1999, 55, 14353



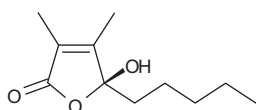
### 366 2,3-Hydro-7-deacetoxyanuthone A

Type: Monocarbocyclic aldehydes and ketones. C<sub>22</sub>H<sub>34</sub>O<sub>4</sub> Oil, [α]<sub>D</sub> = -2.1° (c = 0.3, CHCl<sub>3</sub>). Source: Marine-derived fungus *Penicillium* sp. Pharm: Cytotoxic (*in vitro*, a panel of 5 hmn tumor cell lines, moderate). Ref: X. Li, et al, JNP, 2003, 66, 1499 | M. Saleem, et al, NPR, 2007, 24, 1142 (rev)



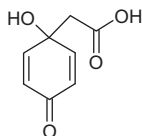
### 367 5β-Hydroxy-3,4-dimethyl-5-pentyl-2(5H)-furanon

Type: Monocarbocyclic aldehydes and ketones. C<sub>11</sub>H<sub>18</sub>O<sub>3</sub> Source: Soft coral *Simularia* sp. (Hainan, China). Pharm: Antifoulant (*in vitro*, *Balanus amphitrite* larvae, EC<sub>50</sub> = 3.84 µg/mL, LC<sub>50</sub> > 50 µg/mL, LC<sub>50</sub>/EC<sub>50</sub> > 13.02). Ref: H. Shi, et al, Mar. Drugs, 2012, 10, 1331



### 368 1-Hydroxy-4-oxo-2,5-cyclohexadiene-1-acetic acid

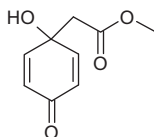
Type: Monocarbocyclic aldehydes and ketones. C<sub>8</sub>H<sub>8</sub>O<sub>4</sub> Cryst. (EtOAc), mp 103–104 °C. Source: Red alga *Delesseria sanguinea*. Pharm: Larvicide; antileishmanial. Ref: G. M. Sharma, et al, J. Antibiot., Ser. A, 1967, 20, 200



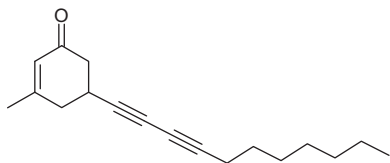


**369 Jacaranone**

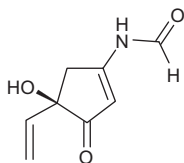
**Type:** Monocarbocyclic aldehydes and ketones.  $C_9H_{10}O_4$  Cryst. ( $CHCl_3$ /hexane), mp 80–81 °C, mp 76–77 °C. **Source:** Red alga *Delesseria sanguinea*. **Pharm:** Cytotoxic; metamorphosis inducer (scallop *Pecten* sp. larva). **Ref:** J. C. Yvin, et al, JNP, 1985, 48, 814

**370 Montiporyne F**

**Type:** Monocarbocyclic aldehydes and ketones.  $C_{18}H_{24}O$  Pale yellow gum. **Source:** Stony coral *Montipora* sp. (along shore of Mundo, Cheju, Korea, depth of 8 m, on Nov. 4, 1996). **Pharm:** Cytotoxic (hmn solid carcinoma cells *in vitro*: A549  $ED_{50} > 50 \mu\text{g/mL}$ , SK-OV-3  $ED_{50} = 29.2 \mu\text{g/mL}$ , SK-MEL-2  $ED_{50} = 36.7 \mu\text{g/mL}$ , XF498  $ED_{50} = +31.3 \mu\text{g/mL}$ , HCT15  $ED_{50} = 45.1 \mu\text{g/mL}$ ; control Cisplatin,  $ED_{50} = 0.6 \mu\text{g/mL}$ , 0.9  $\mu\text{g/mL}$ , 0.7  $\mu\text{g/mL}$ , 0.6  $\mu\text{g/mL}$ , and 0.6  $\mu\text{g/mL}$  respectively). **Ref:** B. H. Bae, et al, JNP, 2000, 63, 1511

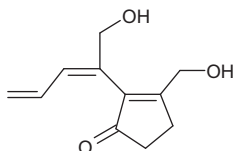
**371 Myrothenone A**

**Type:** Monocarbocyclic aldehydes and ketones.  $C_8H_9NO_3$  Oil,  $[\alpha]_D^{20} = +61^\circ$  ( $c = 0.6$ , MeOH). **Source:** Marine-derived fungus *Myrothecium* sp. **Pharm:** Tyrosinase inhibitor ( $IC_{50} = 6.6 \mu\text{mol/L}$ , control kojic acid,  $IC_{50} = 7.7 \mu\text{mol/L}$ ). **Ref:** M. Saleem, et al, NPR, 2007, 24, 1142 (rev)

**372 Nakienone A**

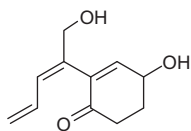
**Type:** Monocarbocyclic aldehydes and ketones.  $C_{11}H_{14}O_3$  **Source:** Cyanobacterium *Synechocystis* sp. from stony coral *Acropora* sp. (Okinawa). **Pharm:** Cytotoxic (KB,

LD<sub>50</sub> = 5 µg/mL, HCT116, LD<sub>50</sub> = 20 µg/mL). Ref: D. G. Nagle, et al, Tet. Lett., 1995, 36, 849 | M. Pour, et al, Tet. Lett., 1997, 38, 525



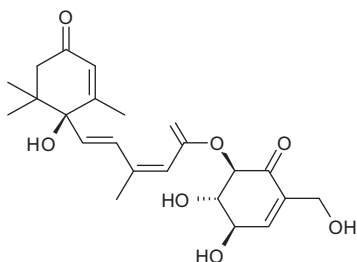
### 373 Nakienone B

Type: Monocarbocyclic aldehydes and ketones. C<sub>11</sub>H<sub>14</sub>O<sub>3</sub> [ $\alpha$ ]<sub>D</sub><sup>25</sup> = +123° (c = 0.1, MeOH) (di-Ac). Source: Cyanobacterium *Synechocystis* sp. from stony coral *Acropora* sp. (Okinawa). Pharm: Cytotoxic (non-selectively to DNA repair defective cell lines: topoisomerase I sensitive Chinese hamster ovary line EM9, topoisomerase II sensitive Chinese hamster ovary line XRS-6, DNA cross-linking agent sensitive UV20, and DNA repair competent BR1 cell lines, LD<sub>50</sub> ≈ 20 µg/mL). Ref: D. G. Nagle, et al, Tet. Lett., 1995, 36, 849 | M. Pour, et al, Tet. Lett., 1996, 37, 4679



### 374 Nigrosopydon A

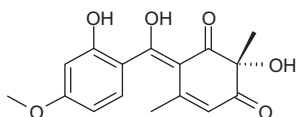
Type: Monocarbocyclic aldehydes and ketones. C<sub>22</sub>H<sub>28</sub>O<sub>2</sub> Amorph. solid, mp 173.6–173.8 °C, [ $\alpha$ ]<sub>D</sub><sup>29</sup> = +10° (c = 0.06, EtOH). Source: Marine-derived fungus *Nigrospora* sp. PSU-F5 from gorgonian sea fan *Annella* sp. (Thailand). Pharm: Antibacterial (*Staphylococcus aureus* ATCC 25923, MIC = 64 µg/mL, MRSA, MIC > 128 µg/mL). Ref: K. Trisuwan, et al, JNP, 2008, 71, 1323



### 375 Penicillenone

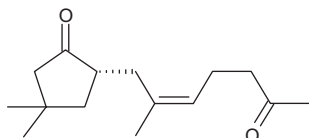
Type: Monocarbocyclic aldehydes and ketones. C<sub>16</sub>H<sub>16</sub>O<sub>6</sub> Amorph. red solid, [ $\alpha$ ]<sub>D</sub><sup>25</sup> = +24° (c = 0.1, MeOH). Source: Mangrove-derived fungus *Penicillium* sp. JP-1

from mangrove *Aegiceras corniculatum* (China waters). **Pharm:** Cytotoxic (MTT assay,  $P_{388}$ ,  $IC_{50} = 1.38 \mu\text{mol/L}$ ). **Ref:** Z. J. Lin, et al, *Phytochemistry*, 2008, 69, 1273



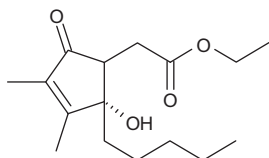
### 376 Sinularone A (2012)

**Type:** Monocarbocyclic aldehydes and ketones.  $C_{15}H_{24}O_2$  Colorless oil,  $[\alpha]_D^{23} = +7.26^\circ$  ( $c = 0.27$ , MeOH). **Source:** Soft coral *Sinularia* sp. (Hainan, China). **Pharm:** Antifoulant (*in vitro*, *Balanus amphitrite* larvae,  $EC_{50} = 13.86 \mu\text{g/mL}$ ,  $LC_{50} > 50 \mu\text{g/mL}$ ,  $LC_{50}/EC_{50} > 3.61$ ). **Ref:** H. Shi, et al, *Mar. Drugs*, 2012, 10, 1331



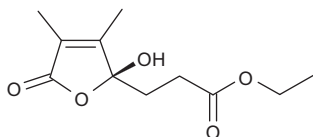
### 377 Sinularone B (2012)

**Type:** Monocarbocyclic aldehydes and ketones.  $C_{16}H_{26}O_4$  Colorless oil,  $[\alpha]_D^{23} = +0.60^\circ$  ( $c = 0.43$ , MeOH), probably artifact. **Source:** Soft coral *Sinularia* sp. (Hainan, China). **Pharm:** Antifoulant (*in vitro*, *Balanus amphitrite* larvae,  $EC_{50} = 23.50 \mu\text{g/mL}$ ,  $LC_{50} > 50 \mu\text{g/mL}$ ,  $LC_{50}/EC_{50} > 2.13$ ). **Ref:** H. Shi, et al, *Mar. Drugs*, 2012, 10, 1331



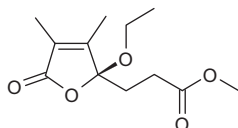
### 378 Sinularone G (2012)

**Type:** Monocarbocyclic aldehydes and ketones.  $C_{11}H_{16}O_5$  Colorless oil,  $[\alpha]_D^{23} = +4.03^\circ$  ( $c = 0.10$ , MeOH), probably artifact. **Source:** Soft coral *Sinularia* sp. (Hainan, China). **Pharm:** Antifoulant (*in vitro*, *Balanus amphitrite* larvae,  $EC_{50} = 18.65 \mu\text{g/mL}$ ,  $LC_{50} > 50 \mu\text{g/mL}$ ,  $LC_{50}/EC_{50} > 2.69$ ). **Ref:** H. Shi, et al, *Mar. Drugs*, 2012, 10, 1331

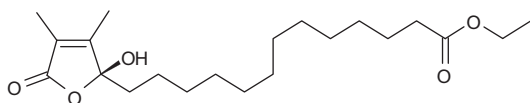


**379 Sinularone H (2012)**

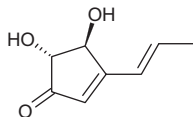
**Type:** Monocarbocyclic aldehydes and ketones.  $C_{12}H_{18}O_5$  Colorless oil,  $[\alpha]_D^{23} = +3.70^\circ$  ( $c = 0.12$ , MeOH), probably artifact. **Source:** Soft coral *Sinularia* sp. (Hainan, China). **Pharm:** Antifoulant (*in vitro*, *Balanus amphitrite* larvae,  $EC_{50} = 21.39 \mu\text{g/mL}$ ,  $LC_{50} > 50 \mu\text{g/mL}$ ,  $LC_{50}/EC_{50} > 2.34$ ). **Ref:** H. Shi, et al, Mar. Drugs, 2012, 10, 1331

**380 Sinularone I (2012)**

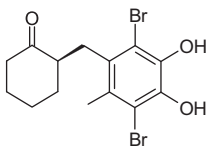
**Type:** Monocarbocyclic aldehydes and ketones.  $C_{21}H_{36}O_5$  Colorless oil,  $[\alpha]_D^{23} = +5.44^\circ$  ( $c = 0.18$ , MeOH), probably artifact. **Source:** Soft coral *Sinularia* sp. (Hainan, China). **Pharm:** Antifoulant (*in vitro*, *Balanus amphitrite* larvae,  $EC_{50} = 12.58 \mu\text{g/mL}$ ,  $LC_{50} > 50 \mu\text{g/mL}$ ,  $LC_{50}/EC_{50} > 3.97$ ). **Ref:** H. Shi, et al, Mar. Drugs, 2012, 10, 1331

**381 (+)-Terrein**

4,5-Dihydroxy-3-(1-propenyl)-2-cyclopenten-1-one **Type:** Monocarbocyclic aldehydes and ketones.  $C_8H_{10}O_3$  mp  $123^\circ\text{C}$ ,  $[\alpha]_{\text{Hg}}^{20} = +185^\circ$  ( $c = 1$ ,  $\text{H}_2\text{O}$ ). **Source:** Marine-derived fungus *Aspergillus terreus* PT06-2 (Grown in High Salt Medium 10% salinity), marine-derived fungus *Aspergillus terreus*, terrestrial fungus (*Aspergillus terreus*). **Pharm:** Antibacterial (*Enterobacter aerogenes*, *Staphylococcus aureus* and *Pseudomonas aeruginosa*, all MICs  $> 100 \mu\text{mol/L}$ ); antifungal (*Candida albicans*, MIC  $> 100 \mu\text{mol/L}$ , control Ketoconazole, MIC =  $5 \mu\text{mol/L}$ ); phytotoxin. **Ref:** Y. Wang, et al, Mar. Drugs, 2011, 9, 1368

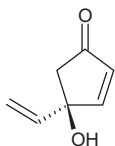
**382 (2R)-2-(2,3,6-Tribromo-4,5-dihydroxybenzyl)cyclohexanone**

**Type:** Monocarbocyclic aldehydes and ketones.  $C_{13}H_{13}Br_3O_3$  White amorph. powder,  $[\alpha]_D^{23} = +7.27^\circ$  ( $c = 0.11$ , MeOH). **Source:** Red alga *Symphycardia latiuscula* (Korea waters). **Pharm:** Cytotoxic ( $IC_{50} = 8.5 \mu\text{g/mL}$ ); antioxidant (DPPH scavenger). **Ref:** J. S. Choi, et al, JNP, 2000, 63, 1705



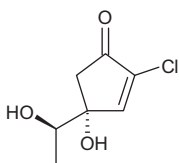
### 383 Trichodenone A

4-Hydroxy-4-vinyl-2-cyclopenten-1-one Type: Monocarbocyclic aldehydes and ketones.  $C_7H_8O_2$  Oil,  $[\alpha]_D^{28} = +56.3^\circ$  ( $c = 0.7$ ,  $CH_2Cl_2$ ). Source: Marine-derived fungus *Trichoderma harzianum* OUPS-N115 from sponge *Halichondria okadai*. Pharm: Cytotoxic ( $P_{388}$ ,  $ED_{50} = 0.21 \mu\text{g/mL}$ , modest). Ref: T. Amagata, et al, J. Antibiot., 1998, 51, 33 | Y. Usami, et al, Synlett, 1999, 723 | Y. Usami, et al, Tetrahedron: Asymmetry, 2000, 11, 3711



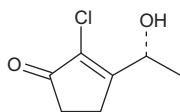
### 384 Trichodenone B

2-Chloro-4-hydroxy-4-(1-hydroxyethyl)-2-cyclopenten-1-one Type: Monocarbocyclic aldehydes and ketones.  $C_7H_9ClO_3$  Oil,  $[\alpha]_D^{28} = -30.4^\circ$  ( $c = 0.34$ ,  $CHCl_3$ ). Source: Marine-derived fungus *Trichoderma harzianum* OUPS-N115 from sponge *Halichondria okadai*. Pharm: Cytotoxic ( $P_{388}$ ,  $ED_{50} = 1.21 \mu\text{g/mL}$ , modest). Ref: T. Amagata, et al, J. Antibiot., 1998, 51, 33 | Y. Usami, et al, Synlett, 1999, 723 | Y. Usami, et al, Tetrahedron: Asymmetry, 2000, 11, 3711



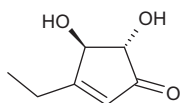
### 385 (R)-Trichodenone C

Type: Monocarbocyclic aldehydes and ketones.  $C_7H_9ClO_2$  Oil,  $[\alpha]_D^{28} = -10.8^\circ$  ( $c = 1.12$ ,  $CHCl_3$ ). Source: Marine-derived fungus *Trichoderma harzianum* OUPS-N115 from sponge *Halichondria okadai*. Pharm: Cytotoxic ( $P_{388}$ ,  $ED_{50} = 1.45 \mu\text{g/mL}$ , modest). Ref: T. Amagata, et al, J. Antibiot., 1998, 51, 33 | Y. Usami, et al, Synlett, 1999, 723 | Y. Usami, et al, Tetrahedron: Asymmetry, 2000, 11, 3711



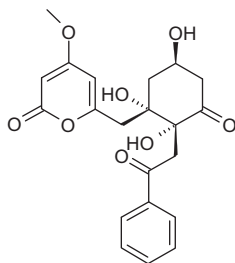
### 386 Trichoderone

(-)-(4*R*\*,5*S*\*)-3-Ethyl-4,5-dihydroxycyclopent-2-enone Type: Monocarbocyclic aldehydes and ketones.  $C_7H_{10}O_3$  Amorph. solid,  $[\alpha]_D^{20} = -4.84^\circ$  ( $c = 0.93$ ,  $CHCl_3$ ). Source: Deep-sea fungus *Trichoderma* sp. (deep-sea sediment of South China Sea). Pharm: Cytotoxic (A549,  $IC_{50} = 50.2 \mu\text{mol/L}$ , control Cisplatin,  $IC_{50} = 17.5 \mu\text{mol/L}$ ; NCI-H460,  $IC_{50} = 164 \mu\text{mol/L}$ , Cisplatin,  $IC_{50} = 20.4 \mu\text{mol/L}$ ; MCF7,  $IC_{50} = 63.5 \mu\text{mol/L}$ , Cisplatin,  $IC_{50} = 85.1 \mu\text{mol/L}$ ; MDA-MB-435,  $IC_{50} = 617 \mu\text{mol/L}$ , Cisplatin,  $IC_{50} = 67 \mu\text{mol/L}$ ; HeLa,  $IC_{50} = 85.6 \mu\text{mol/L}$ ; DU145,  $IC_{50} = 43.2 \mu\text{mol/L}$ ; HLF,  $IC_{50} > 7020 \mu\text{mol/L}$ , Cisplatin,  $IC_{50} = 15.4 \mu\text{mol/L}$ ; probably inhibits growth of cancer cell lines by inducing apoptosis) (You, 2010); cytotoxic (A549 and NCI-H460,  $\text{InRt} > 80\%$ ,  $\text{SI} > 100$ ); inhibitor of HIV protease; inhibitor of Taq DNA polymerase. Ref: H. Takami, et al, *FEMS Microbiol. Lett.*, 1997, 152, 279 | J. L. You, et al, *J. Ind. Microbiol. Biotechnol.*, 2010, 37, 245



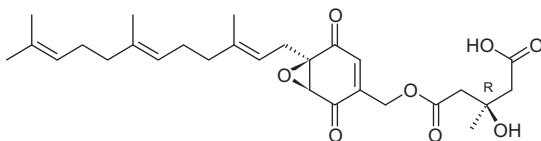
### 387 Wailupemycin A

Type: Monocarbocyclic aldehydes and ketones.  $C_{21}H_{22}O_8$   $[\alpha]_D = +30.0^\circ$  ( $c = 0.4$ , MeOH). Source: Marine-derived streptomycete *Streptomyces* sp. BD-26T (shallow water sediment, Hawaii). Pharm: Antibacterial (gram-negative bacterium *Escherichia coli*). Ref: N. Sitachitta, et al, *Tetrahedron*, 1996, 52, 8073



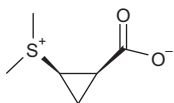
### 388 Yanuthone D

Type: Monocarbocyclic aldehydes and ketones.  $C_{28}H_{38}O_8$  Source: Marine-derived fungus *Aspergillus niger* F97S11 from ascidian *Aplidium* sp. Pharm: Antibacterial (MRSA, most active compared to MSSA; VREF). Ref: T. S. Bugni, et al, *JOC*, 2000, 65, 7195 | T. S. Bugni, et al, *NPR*, 2004, 21, 143 (rev)



### 389 Gonyauline

2-(Dimethylsulfonio)cyclopropanecarboxylate Type: Monocarbocyclic carboxylic acids and lactones.  $C_6H_{10}O_2S$   $[\alpha]_D = +214^\circ$  ( $c = 0.83$ , MeOH). Source: Dinoflagellate *Gonyaulax polyedra*. Pharm: Shortens period of circadian clock for host organism. Ref: T. Roenneberg, et al, *Experientia*, 1990, 47, 103 | H. Nakamura, *JCS Perkin I*, 1990, 3219 | H. Nakamura, et al, *Tet. Lett.*, 1992, 33, 2821



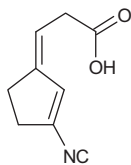
### 390 2-Heptyl-1-cyclopropanepropanoic acid

Lyngbyoic acid Type: Monocarbocyclic carboxylic acids and lactones.  $C_{13}H_{24}O_2$  Source: Cyanobacteria *Lyngbya* cf. *majuscula* (major metabolite, India watersn River Lagoon, Florida, USA). Pharm: Antibacterial (quorum sensing,  $IC_{50} = 100 \mu\text{mol/L}$ , MMOA: inhibits homoserine lactone receptor LasR); disruptor of quorum sensing pathways mediated by acylhomoserine lactones (AHLs) in gram-negative bacteria. Ref: J. C. Kwan, et al, *Mol. Biosyst.* 2011, 7, 1205



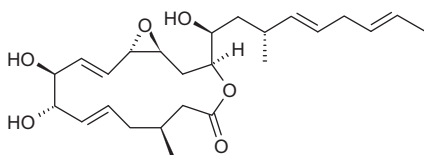
### 391 Homothallin

3-(3-Isocyanocyclopenten-1-ylidene)propanoic acid Type: Monocarbocyclic carboxylic acids and lactones.  $C_9H_9NO_2$  Unstable prisms. Source: Marine-derived fungi *Trichoderma hamatum* and *Trichoderma harzianum*, gorgonian *Plexaura homomalla*. Pharm: Antibacterial; inhibits hmn organisms which digest cellulose. Ref: D. Brewer, et al, *Can. J. Microbiol.*, 1982, 28, 1252 | R. J. Parry, et al, *Tet. Lett.*, 1982, 23, 1435 | P. J. Scheuer, et al, *Science* (Washington, D.C.), 1990, 248, 173 | C. H. Lee, et al, *J. Antibiot.*, 1997, 50, 469 | S. Yamamoto, et al, *Biochem. Biophys. Res. Commun.*, 2005, 330, 622



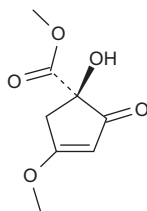
### 392 Iriomoteolide 3a

**Type:** Monocarbocyclic carboxylic acids and lactones.  $C_{25}H_{38}O_6$  Amorph. solid,  $[\alpha]_D^{22} = +24^\circ$  ( $c = 0.18$ ,  $CHCl_3$ ). **Source:** Dinoflagellate *Amphidinium* sp. HYA024  
**Pharm:** Cytotoxic (DG-75 cell,  $IC_{50} = 0.08 \mu\text{g/mL}$ ; Raji cell,  $IC_{50} = 0.05 \mu\text{g/mL}$ ). **Ref:** K. Oguchi, et al, JOC, 2008, 73, 1567



### 393 (R)-Kjellmanianone

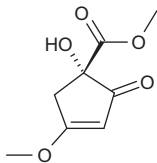
**Type:** Monocarbocyclic carboxylic acids and lactones.  $C_8H_{10}O_5$  Cryst., mp 157–158 °C,  $[\alpha]_D = -133^\circ$  ( $c = 1.15$ ,  $CHCl_3$ ). **Source:** Brown algae *Sargassum kjellmanianum* and *Sargassum tortile*. **Pharm:** Antibacterial (gram-positive bacteria *Escherichia coli* and *Bacillus subtilis*); cytotoxic ( $P_{388}$ ,  $ED_{50} = 15.3 \mu\text{g/mL}$ , control Etoposide,  $ED_{50} = 0.24 \mu\text{g/mL}$ ). **Ref:** M. Nakayama, et al, Chem. Lett., 1980, 1243 | Numata, et al, CPB, 1991, 39, 2129 | J. Zhu, et al, Tetrahedron, 1994, 50, 10597



### 394 (+)-Kjellmanianone

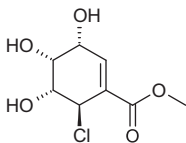
**Type:** Monocarbocyclic carboxylic acids and lactones.  $C_8H_{10}O_5$  Cryst., mp 139–139.5 °C,  $[\alpha]_D = +1.6^\circ$  ( $c = 1.8$ ,  $CHCl_3$ ). **Source:** Brown alga *Sargassum kjellmanianum*. **Pharm:** Antibacterial (gram-positive bacteria, *Escherichia coli* and *Bacillus subtilis*). **Ref:** M. Nakayama, et al, Chem. Lett., 1980, 1243 | B. -C. Chen, et al, Tetrahedron, 1991, 47, 173





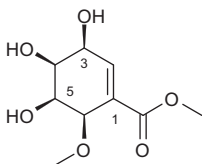
### 395 Pericosine A

**Type:** Monocarbocyclic carboxylic acids and lactones.  $C_8H_{11}ClO_5$  Plates (MeOH), mp 95–97 °C,  $[\alpha]_D = +57^\circ$  ( $c = 3.2$ , EtOH),  $[\alpha]_D^{22} = +104^\circ$  ( $c = 0.04$ , EtOH), **Source:** Marine-derived fungus *Periconia byssoides* OUPS-N133 from sea hare *Aplysia kurodai* (gastrointestinal tract). **Pharm:** Cytotoxic (disease-oriented panel of 38 hmn cancer cell lines (Japanese HCC panel), MG-MID (mean value of  $\log GI_{50}/M$  over all cell lines tested) =  $-4.82$ , Delta (difference in  $\log GI_{50}/M$  value of the most sensitive cell and the MG-MID value) =  $2.45$ , Range (difference in  $\log GI_{50}/M$  value of the most sensitive cell and the least sensitive cell) =  $2.66$ ); cytotoxic ( $P_{388}$ , growth inhibition,  $ED_{50} = 0.1 \mu\text{g/mL}$ ); cytotoxic (selective for HBC5,  $\log GI_{50}/M = -5.22$ ; SNB75,  $\log GI_{50}/M = -7.27$ ), antineoplastic (*in vivo*  $P_{388}$ ); EGFR protein kinase inhibitor; topoisomerase II inhibitor. **Ref:** A. Numata, et al, Tet. Lett., 1997, 38, 8215 | Y. Usami, et al, JOC, 2007, 72, 6127 | T. Yamada, et al, Org. Biomol. Chem., 2007, 5, 3979



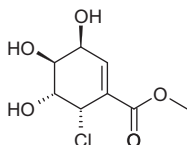
### 396 Pericosine B

**Type:** Monocarbocyclic carboxylic acids and lactones.  $C_9H_{14}O_6$  Oil,  $[\alpha]_D = +22.3^\circ$  ( $c = 0.82$ , EtOH). **Source:** Marine-derived fungus *Periconia byssoides* OUPS-N133 from sea hare *Aplysia kurodai* (gastrointestinal tract). **Pharm:** Cytotoxic ( $P_{388}$ , cell growth inhibitor,  $ED_{50} = 4.0 \mu\text{g/mL}$ ). **Ref:** A. Numata, et al, Tet. Lett., 1997, 38, 8215 | T. J. Donohoe, et al, Tet. Lett., 1998, 39, 8755 | T. Yamada, et al, Org. Biomol. Chem., 2007, 5, 3979

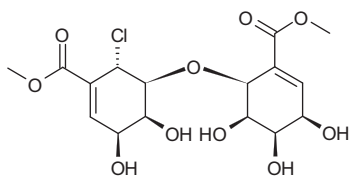


**397 Pericosine D**

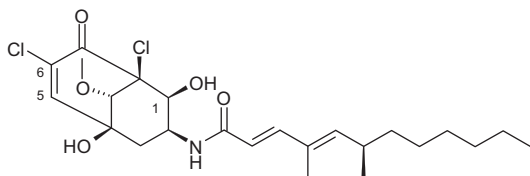
**Type:** Monocarboyclic carboxylic acids and lactones.  $C_8H_{11}ClO_5$  Oil,  $[\alpha]_D^{25} = -273.6^\circ$  ( $c = 0.01$ , EtOH). **Source:** Marine-derived fungus *Periconia byssoides* OUPS-N133 from sea hare *Aplysia kurodai*. **Pharm:** Cytotoxic ( $P_{388}$ , cell growth inhibitor,  $ED_{50} = 3.0 \mu\text{g}/\text{mL}$ ). **Ref:** T. Yamada, et al, *Org. Biomol. Chem.*, 2007, 5, 3979

**398 Pericosine E**

**Type:** Monocarboyclic carboxylic acids and lactones.  $C_{16}H_{21}ClO_{10}$  Plates (MeOH), mp 213–215 °C,  $[\alpha]_D = -31.5^\circ$  ( $c = 0.43$ , EtOH). **Source:** Marine-derived fungus *Periconia byssoides* OUPS-N133 from sea hare *Aplysia kurodai*. **Pharm:** Cytotoxic (disease-oriented panel of 38 hmn cancer cell lines (Japanese HCC panel), MG-MID (mean value of  $\log GI_{50}/M$  over all cell lines tested.) =  $-4.01$ , Delta (difference in  $\log GI_{50}/M$  value of the most sensitive cell and the MG-MID value) =  $0.16$ , Range (difference in  $\log GI_{50}/M$  value of the most sensitive cell and the least sensitive cell) =  $0.17$ ). **Ref:** T. Yamada, et al, *Org. Biomol. Chem.*, 2007, 5, 3979

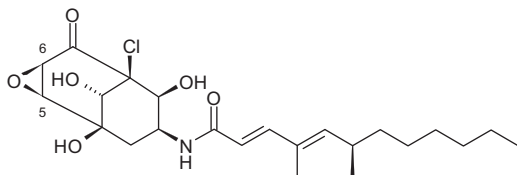
**1.6 Polycyclic Aldehydes and Ketones****399 Gymnastatin F**

**Type:** Polycyclic aldehydes and ketones.  $C_{24}H_{35}Cl_2NO_5$  Powder,  $[\alpha]_D^{26} = -77.7^\circ$  ( $c = 0.16$ ,  $CHCl_3$ ). **Source:** Marine-derived fungus *Gymnascella dankaliensis* from sponge *Halichondria japonica* (off Osaka, Japan). **Pharm:** Cytotoxic ( $P_{388}$ , pronounced). **Ref:** T. Amagata, et al, *JNP*, 2006, 69, 1384

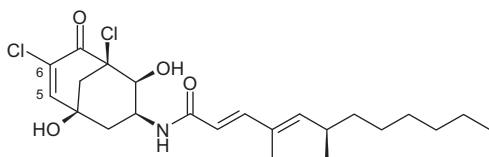


**400 Gymnastatin G**

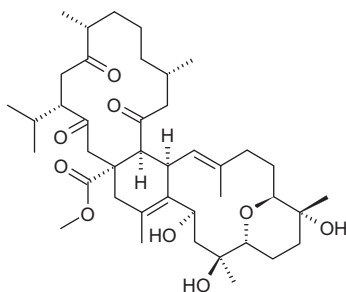
**Type:** Polycyclic aldehydes and ketones.  $C_{23}H_{34}ClNO_6$  Powder,  $[\alpha]_D = -53.1^\circ$  ( $c = 1.5$ ,  $CHCl_3$ ). **Source:** Marine-derived fungus *Gymnascella dankaliensis* from sponge *Halichondria japonica* (off Osaka, Japan). **Pharm:** Cytotoxic ( $P_{388}$ , pronounced). **Ref:** T. Amagata, et al, JNP, 2006, 69, 1384

**401 Gymnastatin R**

**Type:** Polycyclic aldehydes and ketones.  $C_{23}H_{33}Cl_2NO_4$  Powder, mp 79–82 °C,  $[\alpha]_D^{23} = -104.5^\circ$  ( $c = 0.48$ , EtOH). **Source:** Marine-derived fungus *Gymnascella dankaliensis* from sponge *Halichondria japonica* (off Osaka, Japan). **Pharm:** Cytotoxic ( $P_{388}$ , cell growth inhibitor). **Ref:** T. Amagata, et al, JNP, 2008, 71, 340

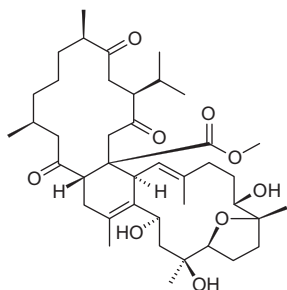
**402 Lobophytone A**

**Type:** Polycyclic aldehydes and ketones.  $C_{41}H_{64}O_9$  **Source:** Soft coral *Lobophytum pauciflorum* (Sanya Bay, Hainan, China). **Pharm:** Anti-6-OHDA cytotoxic effect (SH-SY5Y neuroblastoma cells). **Ref:** P. Yan, et al, Org. Lett., 2010, 12, 2484

**403 Lobophytone O**

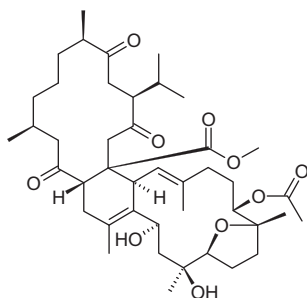
**Type:** Polycyclic aldehydes and ketones.  $C_{41}H_{64}O_9$  Amorph. powder,  $[\alpha]_D^{25} = +140.4^\circ$  ( $c = 1.25$ ,  $CHCl_3$ ). **Source:** Soft coral *Lobophytum pauciflorum* (Sanya Bay, Hainan, China). **Pharm:** LPS-induced NO production inhibitor (mouse peritoneal

macrophages,  $IC_{50} > 10 \mu\text{mol/L}$ , weak); cytotoxic (mouse peritoneal macrophages,  $IC_{50} > 10 \mu\text{mol/L}$ , weak); antibacterial (*Pseudomonas aeruginosa* and *Escherichia coli*, weak); antifungal (*Candida albicans* and *Aspergillus fumigatus*, weak). Ref: P. Yan, et al, Mar. Drugs, 2010, 8, 2837



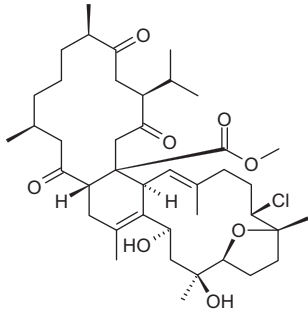
#### 404 Lobophytone P

Type: Polycyclic aldehydes and ketones.  $C_{43}H_{66}O_{10}$  Amorph. powder,  $[\alpha]_D^{25} = +133.7^\circ$  ( $c = 0.33$ ,  $CHCl_3$ ). Source: Soft coral *Lobophytum pauciflorum* (Sanya Bay, Hainan, China). Pharm: LPS-induced NO production inhibitor (mouse peritoneal macrophages,  $IC_{50} > 10 \mu\text{mol/L}$ , weak); cytotoxic (mouse peritoneal macrophages,  $IC_{50} > 10 \mu\text{mol/L}$ , weak); antibacterial (*Pseudomonas aeruginosa* and *Escherichia coli*, weak); antifungal (*Candida albicans* and *Aspergillus fumigatus*, weak). Ref: P. Yan, et al, Mar. Drugs, 2010, 8, 2837



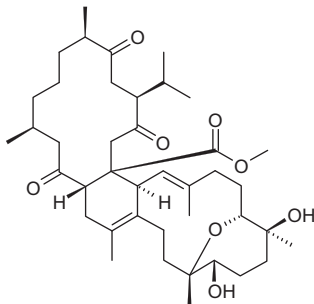
#### 405 Lobophytone Q

Type: Polycyclic aldehydes and ketones.  $C_{41}H_{63}ClO_8$  Amorph. powder,  $[\alpha]_D^{25} = +121.2^\circ$  ( $c = 1.30$ ,  $CHCl_3$ ). Source: Soft coral *Lobophytum pauciflorum* (Sanya Bay, Hainan, China). Pharm: LPS-induced NO production inhibitor (mouse peritoneal macrophages,  $IC_{50} = 2.8 \mu\text{mol/L}$ ); cytotoxic (mouse peritoneal macrophages,  $IC_{50} > 10 \mu\text{mol/L}$ , weak); antibacterial (*Staphylococcus aureus*, *Staphylococcus pneumoniae* and *Saccharomyces cerevisiae*,  $20 \mu\text{g/mL}$ , InRt = 90%; *Pseudomonas aeruginosa* and *Escherichia coli*, weak); antifungal (*Candida albicans* and *Aspergillus fumigatus*, weak). Ref: P. Yan, et al, Mar. Drugs, 2010, 8, 2837



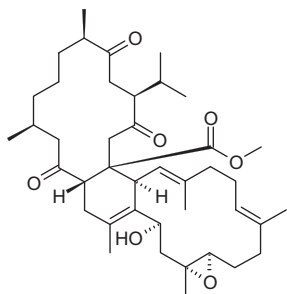
#### 406 Lobophytone R

**Type:** Polycyclic aldehydes and ketones.  $C_{41}H_{64}O_8$  Amorph. powder,  $[\alpha]_D^{25} = +151.1^\circ$  ( $c = 0.51$ ,  $CHCl_3$ ). **Source:** Soft coral *Lobophytum pauciflorum* (Sanya Bay, Hainan, China). **Pharm:** LPS-induced NO production inhibitor (mouse peritoneal macrophages,  $IC_{50} > 10 \mu\text{mol/L}$ , weak); cytotoxic (mouse peritoneal macrophages,  $IC_{50} > 10 \mu\text{mol/L}$ , weak); antibacterial (*Pseudomonas aeruginosa* and *Escherichia coli*, weak); antifungal (*Candida albicans* and *Aspergillus fumigatus*, weak). **Ref:** P. Yan, et al, Mar. Drugs, 2010, 8, 2837



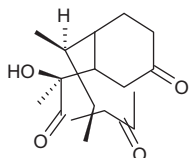
#### 407 Lobophytone S

**Type:** Polycyclic aldehydes and ketones.  $C_{41}H_{62}O_7$  Amorph. powder,  $[\alpha]_D^{25} = +101.1^\circ$  ( $c = 0.60$ ,  $CHCl_3$ ). **Source:** Soft coral *Lobophytum pauciflorum* (Sanya Bay, Hainan, China). **Pharm:** LPS-induced NO production inhibitor (mouse peritoneal macrophages,  $IC_{50} > 10 \mu\text{mol/L}$ , weak); cytotoxic (mouse peritoneal macrophages,  $IC_{50} > 10 \mu\text{mol/L}$ , weak); antibacterial (*Pseudomonas aeruginosa* and *Escherichia coli*, weak); antifungal (*Candida albicans* and *Aspergillus fumigatus*, weak). **Ref:** P. Yan, et al, Mar. Drugs, 2010, 8, 2837



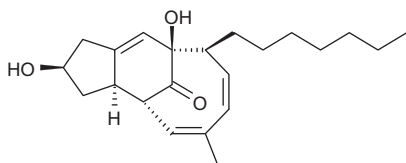
#### 408 Penicillone A

**Type:** Polycyclic aldehydes and ketones.  $C_{14}H_{18}O_4$  Plates (Me<sub>2</sub>CO), mp 200–201 °C,  $[\alpha]_D^{20} = +169.7^\circ$  ( $c = 0.2$ , MeOH). **Source:** Marine-derived fungus *Penicillium terrestre*. **Pharm:** Cytotoxic (P<sub>388</sub> and A549, weak). **Ref:** W. -H. Liu, et al, Tet. Lett., 2005, 46, 4993 | M. Saleem, et al, NPR, 2007, 24, 1142 (rev)



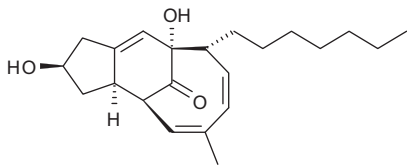
#### 409 Penostatin F

**Type:** Polycyclic aldehydes and ketones.  $C_{22}H_{32}O_3$   $[\alpha]_D = -12.5^\circ$  ( $c = 0.24$ , CHCl<sub>3</sub>). **Source:** Marine-derived fungus *Penicillium* sp. strain OUPS-79 from green alga *Enteromorpha intestinalis*. **Pharm:** Cytotoxic (P<sub>388</sub>, ED<sub>50</sub> = 1.4 μg/mL). **Ref:** C. Iwamoto, et al, JCS Perkin I, 1998, 449



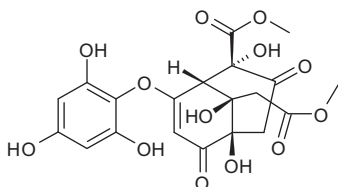
#### 410 Penostatin I

**Type:** Polycyclic aldehydes and ketones.  $C_{22}H_{32}O_3$   $[\alpha]_D = +13.3^\circ$  ( $c = 0.30$ , CHCl<sub>3</sub>). **Source:** Marine-derived fungus *Penicillium* sp. strain OUPS-79 from green alga *Enteromorpha intestinalis*. **Pharm:** Cytotoxic (P<sub>388</sub>, ED<sub>50</sub> = 1.2 μg/mL). **Ref:** C. Iwamoto, et al, JCS Perkin I, 1998, 449



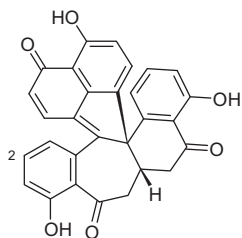
#### 411 Sargassumol

**Type:** Polycyclic aldehydes and ketones.  $C_{20}H_{20}O_{13}$  **Source:** Brown alga *Sargassum micracanthum* (Wando County, Jeonnam province, S. Korea). **Pharm:** Antioxidant (radical scavenger). **Ref:** C. Kim, et al, J. Antibiot., 2012, 65, 87



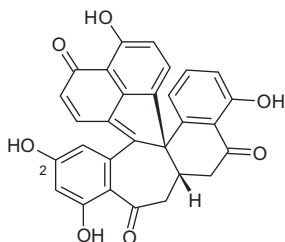
#### 412 Sporothrin A

Dalesconol A **Type:** Polycyclic aldehydes and ketones.  $C_{29}H_{18}O_6$  Red needles, mp 283–284 °C. **Source:** Mangrove-derived fungi *Sporothrix* sp. 4335 and *Daldinia eschscholzii* IFB-TL01. **Pharm:** AChE inhibitor ( $IC_{50} = 1.05 \mu\text{mol/L}$ ); cytotoxic (HepG2,  $IC_{50} = 50 \mu\text{g/mL}$ ); immunosuppressant. **Ref:** Y. L. Zhang, et al, Angew. Chem., Int. Ed., 2008, 47, 5823 | L. Wen, et al, JOC, 2009, 74, 1093 | M. E. Rateb, et al, NPR, 2011, 28, 290 (rev)



#### 413 Sporothrin B

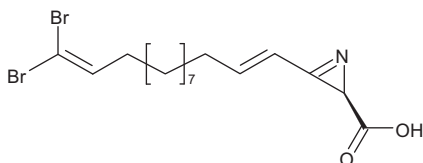
Dalesconol B **Type:** Polycyclic aldehydes and ketones.  $C_{29}H_{18}O_7$  Red needles, mp 280–282 °C. **Source:** Mangrove-derived fungi *Sporothrix* sp. 4335 and *Daldinia eschscholzii* IFB-TL01. **Pharm:** Cytotoxic (HepG2,  $IC_{50} = 20 \mu\text{g/mL}$ ). **Ref:** Y. L. Zhang, et al, Angew. Chem., Int. Ed., 2008, 47, 5823 | L. Wen, et al, JOC, 2009, 74, 1093 | M. E. Rateb, et al, NPR, 2011, 28, 290 (rev)



## 1.7 Heteroalicyclic

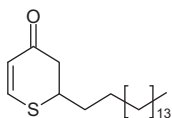
### 414 Motualevic acid F

**Type:** Simple heteroalicyclics (one N).  $C_{16}H_{23}Br_2NO_2$  Pale yellow solid,  $[\alpha]_D = -74^\circ$  ( $c = 0.1$ , MeOH). **Source:** Lithistid sponge *Siliquariaspongia* sp. (Motualevu Reef, Fiji). **Pharm:** Antibacterial (microbroth dilution assay, *Staphylococcus aureus*,  $MIC_{50} = (1.2 \pm 0.3)\mu\text{g/mL}$ ; MRSA,  $MIC_{50} = (3.9 \pm 1.0)\mu\text{g/mL}$ ); antibacterial (agar disk diffusion assay, *Staphylococcus aureus*,  $2\mu\text{g/mL}$ , IZD = 8–11 mm; MRSA,  $5\mu\text{g/mL}$ , IZD = 8–11 mm). **Ref:** J. L. Keffer, et al, *Org. Lett.*, 2009, 11, 1087 | P. L. Winder, et al, *Mar. Drugs*, 2011, 9, 2644 (rev)



### 415 Dihydrothiopyranone

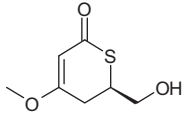
2-Hexadecyl-2,3-dihydro-4H-thiopyran-4-one **Type:** Simple heteroalicyclics (one S).  $C_{21}H_{38}OS$   $[\alpha]_D = -14.6^\circ$  ( $c = 0.9$ , MeOH). **Source:** Sponge *Reniochalina* sp. (Chuuk State, Federated States of Micronesia). **Pharm:** Cytotoxic (ACHN, NCI-H23, MDA-MB-231, HCT15, NUGC-3, and PC3, all  $GI_{50} > 10\mu\text{g/mL}$ , control Adriamycin,  $GI_{50} = (0.198-0.708)\mu\text{g/mL}$ ). **Ref:** H. -S. Lee, et al, *Lipids*, 2009, 44, 71



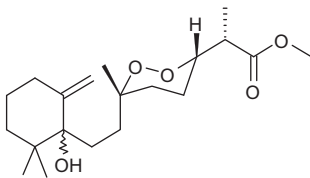
### 416 Thiopalmyrone

**Type:** Simple heteroalicyclics (one S).  $C_7H_{10}O_3S$  **Source:** Cyanobacteria *Oscillatoria* cf. and *Hormoscilla* spp. (assemblage, North beach, Palmyra Atoll). **Pharm:** Molluscicidal (snail *Biomphalaria glabrata*, potent). **Ref:** A. R. Pereira, et al, *JNP*, 2011, 74, 1175

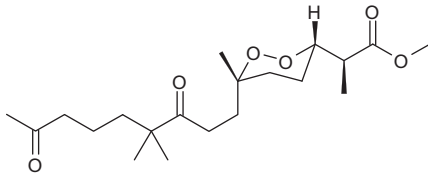


**417 Aikupikoxide B**

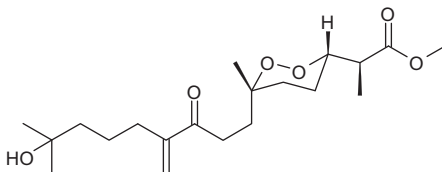
(3*S*,4*S*,7*S*,10*ξ*)-10,15-Cyclo-4,7-epoxy-10-hydroxy-1-nor-11(18)-phyten-2-oic acid methyl ester Type: Simple heteroalicyclics (two O). C<sub>20</sub>H<sub>34</sub>O<sub>5</sub> Oil, [α]<sub>D</sub> = +76° (c = 0.5, CH<sub>2</sub>Cl<sub>2</sub>). Source: Sponge *Diacarnus erythraenus* (Red Sea). Pharm: Cytotoxic (P<sub>388</sub> ATCC: CCL46, A549 ATCC: CCL8 and HT29 ATCC: HTB38, IC<sub>50</sub> > 1 μg/mL). Ref: D. T. A. Youssef, et al, JNP, 2001, 64, 1332

**418 Aikupikoxide C**

Type: Simple heteroalicyclics (two O). C<sub>20</sub>H<sub>34</sub>O<sub>6</sub> Oil, [α]<sub>D</sub> = +88° (c = 2.0, CH<sub>2</sub>Cl<sub>2</sub>). Source: Sponge *Diacarnus erythraenus* (Red Sea). Pharm: Cytotoxic (P<sub>388</sub> ATCC: CCL46, A549 ATCC: CCL8 and HT29 ATCC: HTB38, IC<sub>50</sub> > 1 μg/mL). Ref: D. T. A. Youssef, et al, JNP, 2001, 64, 1332

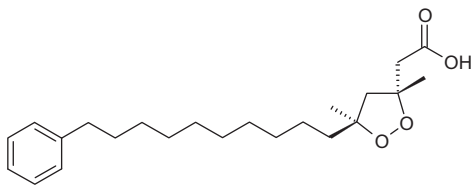
**419 Aikupikoxide D**

Type: Simple heteroalicyclics (two O). C<sub>20</sub>H<sub>34</sub>O<sub>6</sub> Oil, [α]<sub>D</sub> = +69° (c = 0.45, CH<sub>2</sub>Cl<sub>2</sub>). Source: Sponge *Diacarnus erythraenus* (Red Sea). Pharm: Cytotoxic (P<sub>388</sub> ATCC: CCL46, A549 ATCC: CCL8 and HT29 ATCC: HTB38, IC<sub>50</sub> > 1 μg/mL). Ref: D. T. A. Youssef, et al, JNP, 2001, 64, 1332

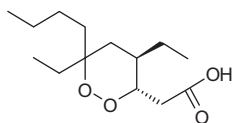


**420 Andavadoic acid**

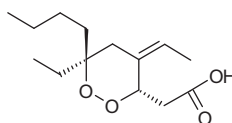
3,5-Dimethyl-5-(10-phenyldecyl)-1,2-dioxolane-3-acetic acid Type: Simple heteroalicyclics (two O).  $C_{23}H_{36}O_4$  Oil,  $[\alpha]_D = +34.7^\circ$  ( $c = 0.004$ ,  $CHCl_3$ ). Source: Sponge *Plakortis* aff. *simplex*. Pharm: Cytotoxic (13 tumor cells,  $GI_{50}$  values in submicromolar range). Ref: A. Rudi, et al, JNP, 2003, 66, 682

**421 6-Butyl-4,6-diethyl-1,2-dioxan-3-acetic acid**

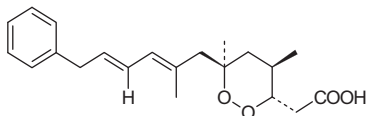
Type: Simple heteroalicyclics (two O).  $C_{14}H_{26}O_4$  Gum,  $[\alpha]_D = +48^\circ$  ( $c = 0.5$ ,  $CHCl_3$ ). Source: Sponge *Callyspongia* sp. (Papua New Guinea). Pharm: Cytotoxic ( $P_{388}$ ,  $ED_{50} = 2.6 \mu\text{g/mL}$ ). Ref: S. I. Toth, et al, JNP, 1994, 57, 123

**422 6-Butyl-6-ethyl-4-ethylidene-1,2-dioxan-3-acetic acid**

Type: Simple heteroalicyclics (two O).  $C_{14}H_{24}O_4$  Faint yellow gum,  $[\alpha]_D = +50^\circ$  ( $c = 0.7$ ,  $CHCl_3$ ). Source: Sponge *Callyspongia* sp. (Papua New Guinea). Pharm: Cytotoxic ( $P_{388}$ ,  $ED_{50} = 5.5 \mu\text{g/mL}$ ). Ref: S. I. Toth, et al, JNP, 1994, 57, 123

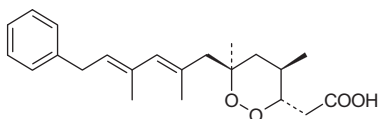
**423 Capucinoic acid A**

Type: Simple heteroalicyclics (two O).  $C_{21}H_{28}O_4$  Source: Sponge *Plakinastrella onkodes* (Dominica). Pharm: Cytotoxic ( $B16F1$ ,  $IC_{50} = 12 \mu\text{g/mL}$ ). Ref: D. E. Williams, et al, JNP, 2001, 64, 281

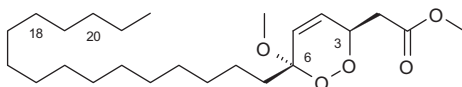


**424 Capucinoic acid B**

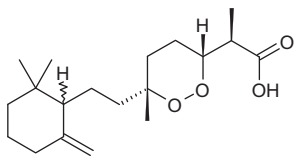
**Type:** Simple heteroalicyclics (two O). C<sub>22</sub>H<sub>30</sub>O<sub>4</sub> Oil (Me ester),  $[\alpha]_D^{25} = -48.7^\circ$  ( $c = 0.37$ , CH<sub>2</sub>Cl<sub>2</sub>) (Me ester). **Source:** Sponges *Plakinastrella onkodes* and *Plakortis* sp. **Pharm:** Cytotoxic. **Ref:** D. E. Williams, et al, JNP, 2001, 64, 281

**425 Chondrillin**

(3*R*,6*S*)-Methyl 6-hexadecyl-3,6-dihydro-6-methoxy-1,2-dioxin-3-acetate **Type:** Simple heteroalicyclics (two O). C<sub>24</sub>H<sub>44</sub>O<sub>5</sub> Pale yellow oil which forms a waxy solid, mp 30 °C,  $[\alpha]_D^{20} = +144^\circ$ . **Source:** Lithistid sponges *Chondrilla* sp. (Great Barrier Reef) and *Chondrilla* spp., sponges *Plakortis simplex* (Taiwan waters), *Plakortis lita*, *Plakortis* spp. and *Plakinastrella onkodes* (Gulf of Mexico). **Pharm:** Cytotoxic (KB16, IC<sub>50</sub> = 0.74 µg/mL; Colon250, inactive); cytotoxic (A549, IC<sub>50</sub> = 0.3 µg/mL; P<sub>388</sub>, IC<sub>50</sub> = 2.4 µg/mL); cell adhesion inducer (EL-4, IC<sub>50</sub> = 0.4 µg/mL); PKC isoenzymesmod-est antagonist (α, IC<sub>50</sub> = 36 µg/mL; βI, IC<sub>50</sub> = 49 µg/mL; βII, IC<sub>50</sub> = 49 µg/mL; δ, IC<sub>50</sub> = 23 µg/mL; ε, IC<sub>50</sub> = 30 µg/mL; γ, IC<sub>50</sub> > 150 µg/mL; ζ, IC<sub>50</sub> = 43 µg/mL). **Ref:** R. J. Wells, Tet. Lett., 1976, 2637 | S. Sakemi, et al, Tetrahedron, 1987, 43, 263 | T. Murayama, et al, Experientia, 1989, 45, 898 | F. S. De Guzman, et al, JNP, 1990, 53, 926 | B. B. Snider, et al, JACS, 1992, 114, 1790 | P. A. Horton, et al, JNP, 1994, 57, 1374 | P.H.Dussault, et al, JACS, 1997, 119, 3824 | P. H. Dussault, et al, JOC, 1999, 64, 1789 | Y. C. Shen, et al, JNP, 2001, 64, 324

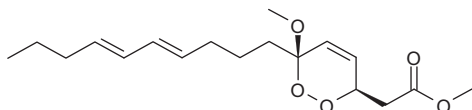
**426 10,15-Cyclo-4,7-epidioxy-1-nor-11(18)-phyten-2-oic acid**

**Type:** Simple heteroalicyclics (two O). C<sub>19</sub>H<sub>32</sub>O<sub>4</sub> Clear colorless oil,  $[\alpha]_D = +45^\circ$  ( $c = 0.46$ , CHCl<sub>3</sub>). **Source:** Sponge *Diacarnus* cf. *spinopoculum* (Solomon Is. and Papua New Guinea). **Pharm:** Differential cytotoxicity (softagar assay, 50 µg/disk, zone differential of 250 units is expected for “selectiveactivity”, C38-L<sub>1210</sub>, 70 zone differential units; M17-L<sub>1210</sub>, 100 zone differential units); cytotoxic (HL60, GI<sub>50</sub> = 1.63 µmol/L; Molt4, GI<sub>50</sub> = 2.16 µmol/L; A549/ATCC, GI<sub>50</sub> = 3.05 µmol/L; KM12, GI<sub>50</sub> = 4.82 µmol/L; LOX-IMVI, GI<sub>50</sub> = 0.25 µmol/L; IGROV1, GI<sub>50</sub> = 0.63 µmol/L; 786-0, GI<sub>50</sub> = 0.94 µmol/L; BT-549, GI<sub>50</sub> = 1.05 µmol/L). **Ref:** S. Sperry, et al, JNP, 1998, 61, 241



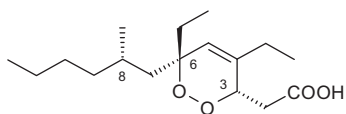
#### 427 2-Demethyl-4-peroxyplakoenic acid A, methyl ester

**Type:** Simple heteroalicyclics (two O).  $C_{18}H_{28}O_5$   $[\alpha]_D^{23} = +52^\circ$  ( $c = 0.25$ ,  $CHCl_3$ ).  
**Source:** Sponge *Plakortis* aff. *simplex* (South Africa). **Pharm:** Cytotoxic ( $P_{388}$ ,  $IC_{50} < 0.1 \mu g/mL$ ). **Ref:** A. Rudi, et al, JNP, 1993, 56, 2178



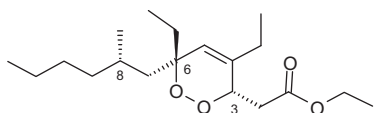
#### 428 4,6-Diethyl-3,6-dihydro-6-(2-methylhexyl)-1,2-dioxin-3-acetic acid

**Type:** Simple heteroalicyclics (two O).  $C_{17}H_{30}O_4$  Oil,  $[\alpha]_D = -19.8^\circ$  ( $c = 0.89$ ,  $CHCl_3$ ).  
**Source:** Sponge *Plakortis* aff. *angulospiculatus* (Palau, Oceania, Oceania). **Pharm:** Antileishmanial (effects on proliferation of *Leishmania mexicana* promastigotes, at  $1 \mu g/mL$ , caused lysis of cell membrane after 24h,  $LD_{50} = 0.29 \mu g/mL$ ; control 1 sponge metabolite Ilimaquinone,  $LD_{50} = 5.6 \mu g/mL$ , control 2 Ketoconazole,  $LD_{50} = 0.06 \mu g/mL$ ). **Ref:** R. S. Compagnone, et al, Tetrahedron, 1998, 54, 3057



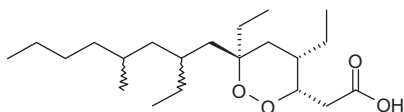
#### 429 (3S,6R,8S)-4,6-Diethyl-3,6-dihydro-6-(2-methylhexyl)-1,2-dioxin-3-acetic acid ethyl ester

**Type:** Simple heteroalicyclics (two O).  $C_{19}H_{34}O_4$  Amorph. solid,  $[\alpha]_D^{20} = -25^\circ$  ( $c = 0.1$ , hexane). **Source:** Sponge *Plakortis* sp. (Amirantes Is., Seychelles, Indian Ocean). **Pharm:** Toxic (brine shrimp *Artemia* sp. larvae,  $LD_{50} > 100 \mu g/mL$ ). **Ref:** J. C. Braekman, et al, JNP, 1998, 61, 1038

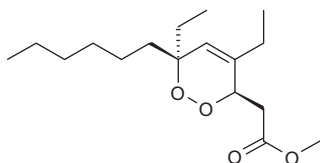


**430 4,6-Diethyl-6-(2-ethyl-4-methyloctyl)-1,2-dioxane-3-acetic acid**

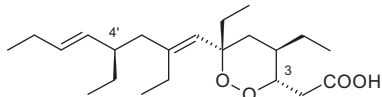
3,6-Epidioxy-4,6,8-triethyl-10-methyltetradecanoic acid Type: Simple heteroalicyclics (two O).  $C_{21}H_{40}O_4$  Amorph. solid,  $[\alpha]_D^{20} = -168^\circ$  ( $c = 1.5$ ,  $CH_2Cl_2$ ). Source: Sponge *Plakortis* sp. (Amirantes Is., Seychelles, Indian Ocean). Pharm: Toxic (brine shrimp *Artemia* sp. larvae,  $LD_{50} = 15 \mu\text{g/mL}$ ). Ref: J. C. Braekman, et al, JNP, 1998, 61, 1038

**431 4,6-Diethyl-6-hexyl-3,6-dihydro-1,2-dioxin-3-acetic acid Me ester**

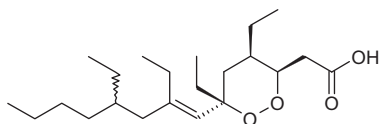
Type: Simple heteroalicyclics (two O).  $C_{17}H_{30}O_4$  Source: Sponge *Plakortis simplex* (psychrophilic, Norway, cold water). Pharm: Cytotoxic (*in vitro*, six solid hmn tumor cell lines,  $IC_{50} = 7-15 \mu\text{g/mL}$ ). Ref: M. Holzwarth, et al, JNP, 2005, 68, 759 | M. D. Lebar, et al, NPR, 2007, 24, 774 (rev) | S. Abbas, Mar. Drugs, 2011, 9, 2423 (rev)

**432 (1'E,3S,4R,4'R,5'E,6S)-6-(2,4-Diethyl-1,5-octadienyl)-4,6-diethyl-1,2-dioxane-3-acetic acid**

Type: Simple heteroalicyclics (two O).  $C_{22}H_{38}O_4$  Pale yellow oil,  $[\alpha]_D^{23} = +76.2^\circ$  ( $c = 1.6$ ,  $CHCl_3$ ). Source: Sponge *Plakortis* sp. (Okinawa). Pharm: Cytotoxic (KB,  $IC_{50} = 0.4 \mu\text{g/mL}$ ,  $L_{1210}$ ,  $IC_{50} = 1.1 \mu\text{g/mL}$ ). Ref: A. Fontana, et al, Tetrahedron, 1998, 54, 2041 | A. Fontana, et al, JNP, 1998, 61, 1427

**433 6-(2,4-Diethyl-1-octenyl)-4,6-diethyl-1,2-dioxane-3-acetic acid**

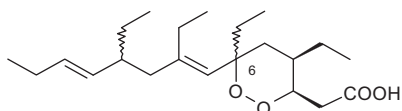
Type: Simple heteroalicyclics (two O).  $C_{22}H_{40}O_4$  Oil (Me ester),  $[\alpha]_D^{23} = +12.4^\circ$  ( $c = 0.4$ ,  $CHCl_3$ ) (Me ester). Source: Sponges *Monotria japonica* and *Plakortis* sp. (Okinawa). Pharm: Oocyte-lytic activity (selectively lyses immature starfish oocytes *Asterina pectinifera*, without affecting nuclear morphology,  $MEC = 13 \mu\text{g/mL}$ ). Ref: M. Yanai, et al, BoMC, 2003, 11, 1715 | A. Fontana, et al, Tetrahedron, 1998, 54, 2041 | A. Fontana, et al, JNP, 1998, 61, 1427



#### 434 3,6-Epidioxy-4,6,8,10-tetraethyltetradeca-7,11-dienoic acid

**Type:** Simple heteroalicyclics (two O).  $C_{22}H_{38}O_4$  Oil,  $[\alpha]_D = +164^\circ$  ( $c = 2.4$ ,  $CHCl_3$ ).

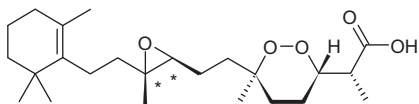
**Source:** Sponge *Plakortis* aff. *angulospiculatus* (Palau, Oceania, Oceania). **Pharm:** Antileishmanial (effects on proliferation of *Leishmania mexicana* promastigotes,  $LD_{50} = 1.00 \mu\text{g/mL}$ ; control 1 sponge metabolite Ilimaquinone,  $LD_{50} = 5.6 \mu\text{g/mL}$ , control 2 Ketoconazole,  $LD_{50} = 0.06 \mu\text{g/mL}$ ). **Ref:** R. S. Compagnone, et al, *Tetrahedron*, 1998, 54, 3057



#### 435 (-)-9,10-Epoxy muquublin A isomer

**Type:** Simple heteroalicyclics (two O).  $C_{24}H_{40}O_5$  Colorless oil,  $[\alpha]_D^{25} = -26.2^\circ$

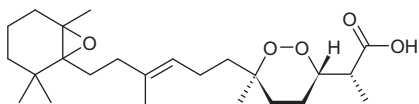
( $c = 0.20$ ,  $CHCl_3$ ). **Source:** Sponge *Diacarnus erythraeanus* (Elfanadir, Hurghada, Egypt). **Pharm:** Cytotoxic (glioma: Hs683,  $IC_{50} = 3 \mu\text{mol/L}$ , U373,  $IC_{50} = 4 \mu\text{mol/L}$ , U251, not tested; melanoma: SK-MEL-28,  $IC_{50} = 15 \mu\text{mol/L}$ ; carcinoma: A549,  $IC_{50} = 3 \mu\text{mol/L}$ , MCF7,  $IC_{50} = 4 \mu\text{mol/L}$ , PC3,  $IC_{50} = 1 \mu\text{mol/L}$ ). **Ref:** F. Lefranc, et al, *JNP*, 2013, 76, 1541



#### 436 (-)-13,14-Epoxy muquublin A

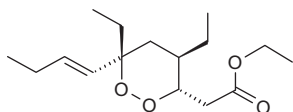
**Type:** Simple heteroalicyclics (two O).  $C_{24}H_{40}O_5$  Colorless oil,  $[\alpha]_D^{25} = -47.8^\circ$

( $c = 0.10$ ,  $CHCl_3$ ). **Source:** Sponge *Diacarnus erythraeanus* (Elfanadir, Hurghada, Egypt). **Pharm:** Cytotoxic (glioma: Hs683,  $IC_{50} = 3 \mu\text{mol/L}$ , U373,  $IC_{50} = 7 \mu\text{mol/L}$ , U251, not tested; melanoma: SK-MEL-28,  $IC_{50} = 22 \mu\text{mol/L}$ ; carcinoma: A549,  $IC_{50} = 3 \mu\text{mol/L}$ , MCF7,  $IC_{50} = 6 \mu\text{mol/L}$ , PC3,  $IC_{50} = 2 \mu\text{mol/L}$ ). **Ref:** F. Lefranc, et al, *JNP*, 2013, 76, 1541

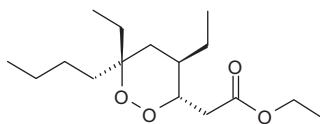


**437 Ethyl didehydroplakortide Z**

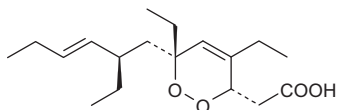
Type: Simple heteroalicyclics (two O).  $C_{16}H_{28}O_4$  Yellow oil,  $[\alpha]_D^{25} = +81.5^\circ$  ( $c = 1.7$ ,  $CH_2Cl_2$ ). Source: Sponge *Plakortis lita* (Papua New Guinea). Pharm: Cytotoxic (*in vitro* solid carcinoma, selective). Ref: B. Harrison, et al, JNP, 1998, 61, 1033

**438 Ethyl plakortide Z**

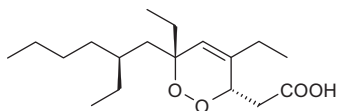
Type: Simple heteroalicyclics (two O).  $C_{16}H_{30}O_4$  Yellow oil,  $[\alpha]_D^{25} = +58.8^\circ$  ( $c = 6.8$ ,  $CH_2Cl_2$ ). Source: Sponge *Plakortis lita* (Papua New Guinea). Pharm: Cytotoxic (solid carcinoma and L<sub>1210</sub>, *in vitro*). Ref: B. Harrison, et al, JNP, 1998, 61, 1033

**439 Haterumadioxin A**

Type: Simple heteroalicyclics (two O).  $C_{18}H_{30}O_4$  Oil,  $[\alpha]_D^{29} = -102^\circ$  ( $c = 1.56$ , MeOH). Source: Sponge *Plakortis lita* (yield = 0.038% ww, Okinawa). Pharm: Cytotoxic (P<sub>388</sub>, IC<sub>50</sub> = 11 ng/mL). Ref: N. Takada, et al, JNP, 2001, 64, 356

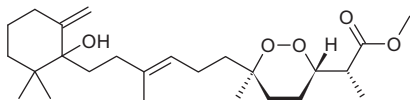
**440 Haterumadioxin B**

Type: Simple heteroalicyclics (two O).  $C_{18}H_{32}O_4$  Oil,  $[\alpha]_D^{29} = -28^\circ$  ( $c = 0.42$ , MeOH). Source: Sponge *Plakortis lita* (yield = 0.008% ww, Okinawa). Pharm: Cytotoxic (P<sub>388</sub>, IC<sub>50</sub> = 5.5 ng/mL). Ref: N. Takada, et al, JNP, 2001, 64, 356

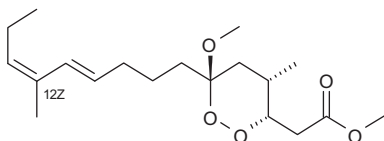


**441 Hurghaperoxide**

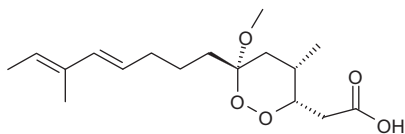
**Type:** Simple heteroalicyclics (two O).  $C_{25}H_{42}O_5$  **Source:** Sponge *Diacarnus erythraeanus* (Elfanadir, Hurghada, Egypt). **Pharm:** Cytotoxic (glioma: Hs683,  $IC_{50} = 37 \mu\text{mol/L}$ , U373,  $IC_{50} = 83 \mu\text{mol/L}$ , U251,  $IC_{50} = 87 \mu\text{mol/L}$ ; melanoma: SK-MEL-28,  $IC_{50} = 73 \mu\text{mol/L}$ ; carcinoma: A549,  $IC_{50} = 31 \mu\text{mol/L}$ , MCF7,  $IC_{50} = 45 \mu\text{mol/L}$ , PC3,  $IC_{50} = 73 \mu\text{mol/L}$ ). **Ref:** F. Lefranc, et al, JNP, 2013, 76, 1541

**442 12-Isomanadoperoxide B**

**Type:** Simple heteroalicyclics (two O).  $C_{19}H_{32}O_5$  Colorless solid,  $[\alpha]_D^{25} -5.0$  ( $c = 0.2$ ,  $\text{CHCl}_3$ ). **Source:** Sponge *Plakortis lita* (Bunaken I., Manado, Indonesia). **Pharm:** Antitrypanosomal (*Trypanosoma brucei rhodesiense*,  $IC_{50} = 0.011 \mu\text{g/mL}$  ( $0.032 \mu\text{mol/L}$ ), ultrapotent, control Melarsoprol,  $IC_{50} = 2.0 \text{ ng/mL}$  ( $5.0 \text{ nmol/L}$ ); cytotoxic (L-6,  $IC_{50} = 3.80 \mu\text{g/mL}$  ( $11.18 \mu\text{mol/L}$ ), control Podophyllotoxin,  $IC_{50} = 0.004 \mu\text{g/mL}$  ( $0.0096 \mu\text{mol/L}$ ). **Ref:** G. Chianese, ET AL, Mar. Drugs, 2013, 11, 3297

**443 Manadic acid A**

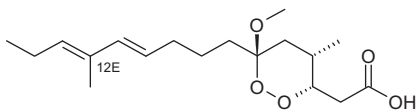
**Type:** Simple heteroalicyclics (two O).  $C_{17}H_{28}O_5$  Oil,  $[\alpha]_D^{18} = +83.9^\circ$  ( $c = 43.8$ , MeOH). **Source:** Sponge *Plakortis* sp. (Indonesia). **Pharm:** Immunomodulatory (MLR,  $IC_{50} = 0.015 \mu\text{g/mL}$ , LCV,  $IC_{50} = 0.55 \mu\text{g/mL}$ ); cytotoxic (P388,  $IC_{50} = 0.5 \mu\text{g/mL}$ , A549,  $IC_{50} = 1 \mu\text{g/mL}$ , HT29,  $IC_{50} = 2 \mu\text{g/mL}$ ; MEL28,  $IC_{50} = 5 \mu\text{g/mL}$ ). **Ref:** T. Ichiba, et al, Tetrahedron, 1995, 51, 12195

**444 (-)-Manadic acid B**

Manadoperoxidic acid B **Type:** Simple heteroalicyclics (two O).  $C_{18}H_{30}O_5$  Colorless solid,  $[\alpha]_D^{25} = -23.0^\circ$  ( $cL = 0.1$ ,  $\text{CHCl}_3$ ). **Source:** Sponge *Plakortis lita* (Bunaken I., Manado, Indonesia). **Pharm:** Antitrypanosomal (*Trypanosoma brucei rhodesiense*,  $IC_{50} = 1.87 \mu\text{g/mL}$  ( $5.74 \mu\text{mol/L}$ ), ultrapotent, control Melarsoprol,  $IC_{50} = 2.0 \text{ ng/mL}$  ( $5.0 \text{ nmol/L}$ ); cytotoxic (L-6,  $IC_{50} = 7.12 \mu\text{g/mL}$  ( $21.84 \mu\text{mol/L}$ ), control Podophyllotoxin,

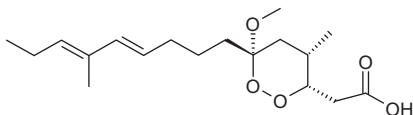


$IC_{50} = 0.004 \mu\text{g/mL}$  ( $0.0096 \mu\text{mol/L}$ ). Ref: G. Chianese, ET AL, Mar. Drugs, 2013, 11, 3297



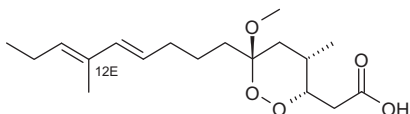
#### 445 (+)-Manadic acid B

Type: Simple heteroalicyclics (two O).  $C_{18}H_{30}O_5$  Oil,  $[\alpha]_D^{18} = +130.3^\circ$  ( $c = 43.8$ , MeOH). Source: Sponge *Plakortis* sp. (Indonesia). Pharm: Cytotoxic ( $P_{388}$ ,  $IC_{50} = 0.5 \mu\text{g/mL}$ , A549,  $IC_{50} = 1 \mu\text{g/mL}$ , HT29,  $IC_{50} = 2 \mu\text{g/mL}$ , MEL28,  $IC_{50} = 2.5 \mu\text{g/mL}$ ). Ref: T. Ichiba, et al, Tetrahedron, 1995, 51, 12195



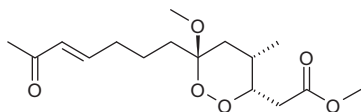
#### 446 Manadoperoxide B

Type: Simple heteroalicyclics (two O).  $C_{19}H_{32}O_5$  Colorless amorphous solid,  $[\alpha]_D^{25} -7.5^\circ$  ( $c = 0.1$ ,  $CHCl_3$ ). Source: Sponge *Plakortis lita* (Bunaken I., Manado, Indonesia). Pharm: Antitrypanosomal (*Trypanosoma brucei rhodesiense*,  $IC_{50} = 3.0 \text{ ng/mL}$  ( $8.8 \text{ nmol/L}$ ), ultrapotent, one of the most potent natural products, either marine or terrestrial, to possess such activity, control Melarsoprol,  $IC_{50} = 2.0 \text{ ng/mL}$  ( $5.0 \text{ nmol/L}$ ); cytotoxic (HMEC1,  $IC_{50} = 10.8 \mu\text{g/mL}$  ( $31.76 \mu\text{mol/L}$ ), control Podophyllotoxin,  $IC_{50} = 0.004 \mu\text{g/mL}$  ( $0.0096 \mu\text{mol/L}$ )). Ref: G. Chianese, et al, Org. Biomol. Chem. 2012, 10, 7197 | G. Chianese, ET AL, Mar. Drugs, 2013, 11, 3297

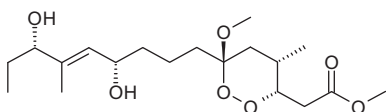


#### 447 Manadoperoxide C

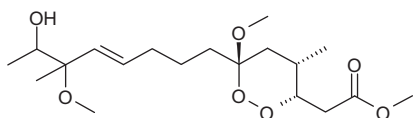
Peroxyplakoric ester C Type: Simple heteroalicyclics (two O).  $C_{16}H_{26}O_6$  Source: Sponges *Plakortis* cf. *simplex* (Bunaken I., Manado, Indonesia) and *Plakortis lita* (Bunaken, Sulawesi, Indonesia). Pharm: Antitrypanosomal (*Trypanosoma brucei rhodesiense*). Ref: C. Fattorusso, et al, JNP, 2010, 73, 1138 | G. Chianese, et al, Org. Biomol. Chem., 2012, 10, 7197

**448 Manadoperoxide E**

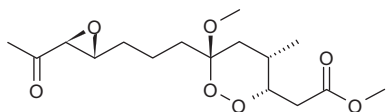
**Type:** Simple heteroalicyclics (two O).  $C_{19}H_{34}O_7$  **Source:** Sponge *Plakortis lita* (Bunaken, Sulawesi, Indonesia). **Pharm:** Antitrypanosomal (*Trypanosoma brucei rhodesiense*). **Ref:** G. Chianese, et al, *Org. Biomol. Chem.*, 2012, 10, 7197

**449 Manadoperoxide F**

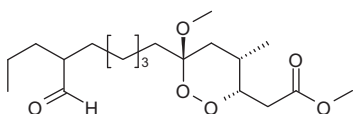
**Type:** Simple heteroalicyclics (two O).  $C_{19}H_{34}O_7$  **Source:** Sponge *Plakortis lita* (Bunaken, Sulawesi, Indonesia). **Pharm:** Antitrypanosomal (*Trypanosoma brucei rhodesiense*). **Ref:** G. Chianese, et al, *Org. Biomol. Chem.*, 2012, 10, 7197

**450 Manadoperoxide G**

**Type:** Simple heteroalicyclics (two O).  $C_{16}H_{26}O_7$  **Source:** Sponge *Plakortis lita* (Bunaken, Sulawesi, Indonesia). **Pharm:** Antitrypanosomal (*Trypanosoma brucei rhodesiense*). **Ref:** G. Chianese, et al, *Org. Biomol. Chem.*, 2012, 10, 7197

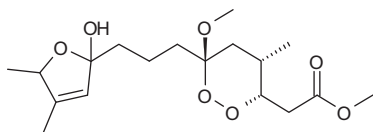
**451 Manadoperoxide H**

**Type:** Simple heteroalicyclics (two O).  $C_{19}H_{34}O_6$  **Source:** Sponge *Plakortis lita* (Bunaken, Sulawesi, Indonesia). **Pharm:** Antitrypanosomal (*Trypanosoma brucei rhodesiense*). **Ref:** G. Chianese, et al, *Org. Biomol. Chem.*, 2012, 10, 7197

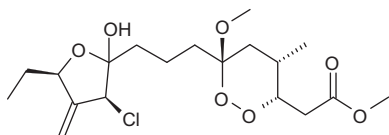


**452 Manadoperoxide I**

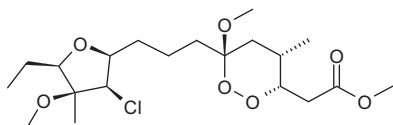
Type: Simple heteroalicyclics (two O).  $C_{18}H_{30}O_7$  Source: Sponge *Plakortis lita* (Bunaken, Sulawesi, Indonesia). Pharm: Antitrypanosomal (*Trypanosoma brucei rhodesiense*). Ref: G. Chianese, et al, Org. Biomol. Chem., 2012, 10, 7197

**453 Manadoperoxide J**

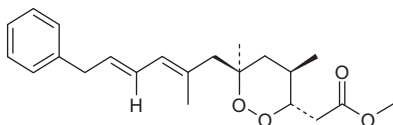
Type: Simple heteroalicyclics (two O).  $C_{19}H_{31}ClO_7$  Source: Sponge *Plakortis lita* (Bunaken, Sulawesi, Indonesia). Pharm: Antitrypanosomal (*Trypanosoma brucei rhodesiense*). Ref: G. Chianese, et al, Org. Biomol. Chem., 2012, 10, 7197

**454 Manadoperoxide K**

Type: Simple heteroalicyclics (two O).  $C_{20}H_{35}ClO_7$  Source: Sponge *Plakortis lita* (Bunaken, Sulawesi, Indonesia). Pharm: Antitrypanosomal (*Trypanosoma brucei rhodesiense*). Ref: G. Chianese, et al, Org. Biomol. Chem., 2012, 10, 7197

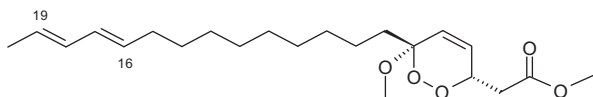
**455 Methyl Capucinoate A**

Type: Simple heteroalicyclics (two O).  $C_{22}H_{30}O_4$  Oil (Me ester),  $[\alpha]_D^{25} = -44.8^\circ$  ( $c = 0.67$ ,  $CH_2Cl_2$ ) (Me ester). Source: Sponge *Plakortis halichondrioides* (Dominica). Pharm: Cytotoxic (B16F1,  $IC_{50} = 12 \mu g/mL$ ). Ref: D. E. Williams, et al, JNP, 2001, 64, 281

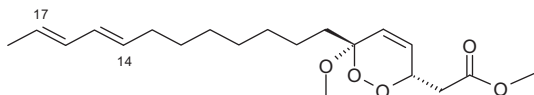


**456 Methyl 3,6-epidioxy-6-methoxy-4,16,18-eicosatrienoate**

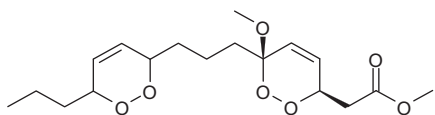
Type: Simple heteroalicyclics (two O).  $C_{22}H_{36}O_5$  Solid, mp 47.5 °C,  $[\alpha]_D^{20} = +36.4^\circ$  ( $c = 1.1$ , MeOH). Source: Sponge *Plakortis lita* (Okinawa). Pharm: Cytotoxic. Ref: S. Sakemi, et al, Tetrahedron, 1987, 43, 263

**457 Methyl 3,6-epidioxy-6-methoxy-4,14,16-octadecatrienoate**

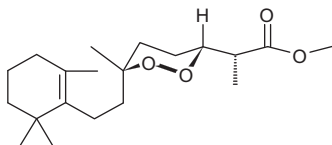
Type: Simple heteroalicyclics (two O).  $C_{20}H_{32}O_5$  Solid, mp 38–39 °C,  $[\alpha]_D^{20} = +40.8^\circ$  ( $c = 4.9$ , MeOH). Source: Sponge *Plakortis lita* (Okinawa). Pharm: Cytotoxic. Ref: S. Sakemi, et al, Tetrahedron, 1987, 43, 263

**458 Methyl-6-methoxy-3,6:10,13-diperoxy-4,11-hexadecadienoate**

Type: Simple heteroalicyclics (two O).  $C_{18}H_{28}O_7$  Source: sponge *Plakortis* aff. *simplex* (South Africa). Pharm: Cytotoxic ( $P_{388}$ ,  $IC_{50} < 0.1 \mu\text{g/mL}$ ). Ref: A. Rudi, et al, JNP, 1993, 56, 2178

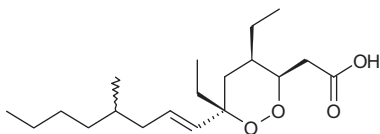
**459 Methyl-nuapapuanoate**

Nuapapu A methyl ester Type: Simple heteroalicyclics (two O).  $C_{20}H_{34}O_4$  Source: Sponge *Diacarnus erythraeanus* (Elfanadir, Hurghada, Egypt). Pharm: Cytotoxic (glioma: Hs683,  $IC_{50} = 38 \mu\text{mol/L}$ , U373,  $IC_{50} = 99 \mu\text{mol/L}$ , U251,  $IC_{50} = 91 \mu\text{mol/L}$ ; melanoma: SK-MEL-28,  $IC_{50} = 80 \mu\text{mol/L}$ ; carcinoma: A549,  $IC_{50} = 25 \mu\text{mol/L}$ , MCF7,  $IC_{50} = 51 \mu\text{mol/L}$ , PC3,  $IC_{50} = 80 \mu\text{mol/L}$ ). Ref: F. Lefranc, et al, JNP, 2013, 76, 1541

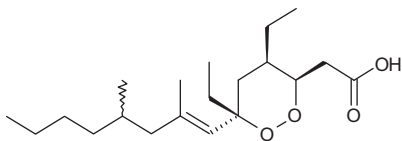


**460 Monotriajaponide B**

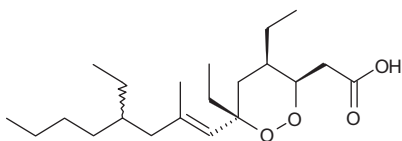
4,6-Diethyl-6-(4-methyl-1-octenyl)-1,2-dioxane-3-acetic acid Type: Simple heteroalicyclics (two O).  $C_{19}H_{34}O_4$  Viscous oil,  $[\alpha]_D^{25} = +127^\circ$  ( $c = 0.52$ ,  $CHCl_3$ ). Source: Sponge *Monotria japonica*. Pharm: Oocyte-lytic activity (selectively lyses immature starfish oocytes *Asterina pectinifera*, without affecting nuclear morphology, MEC = 6.3  $\mu\text{g/mL}$ ). Ref: M. Yanai, et al, BoMC, 2003, 11, 1715

**461 Monotriajaponide C**

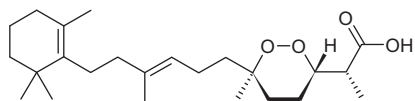
Type: Simple heteroalicyclics (two O).  $C_{20}H_{36}O_4$  Viscous oil,  $[\alpha]_D^{25} = +64^\circ$  ( $c = 0.6$ ,  $CHCl_3$ ). Source: Sponge *Monotria japonica*. Pharm: Oocyte-lytic activity (selectively lyses immature starfish oocytes *Asterina pectinifera*, without affecting nuclear morphology, MEC = 6.3  $\mu\text{g/mL}$ ). Ref: M. Yanai, et al, BoMC, 2003, 11, 1715

**462 Monotriajaponide D**

Type: Simple heteroalicyclics (two O).  $C_{21}H_{38}O_4$  Viscous oil,  $[\alpha]_D^{25} = +108^\circ$  ( $c = 0.9$ ,  $CHCl_3$ ). Source: Sponge *Monotria japonica*. Pharm: Oocyte-lytic activity (selectively lyses immature starfish oocytes *Asterina pectinifera*, without affecting nuclear morphology, MEC = 6.3  $\mu\text{g/mL}$ ). Ref: M. Yanai, et al, BoMC, 2003, 11, 1715

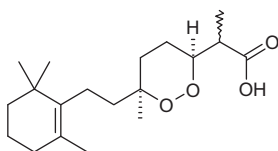
**463 (-)-Muqublin A**

Type: Simple heteroalicyclics (two O).  $C_{24}H_{40}O_4$  Colorless oil,  $[\alpha]_D^{25} = -32.7^\circ$  ( $c = 0.34$ ,  $CHCl_3$ ). Source: Sponge *Diacarnus erythraeanus* (Elfanadir, Hurghada, Egypt). Pharm: Cytotoxic (glioma: Hs683,  $IC_{50} = 4 \mu\text{mol/L}$ , U373,  $IC_{50} = 7 \mu\text{mol/L}$ , U251,  $IC_{50} = 8 \mu\text{mol/L}$ ; melanoma: SK-MEL-28,  $IC_{50} = 8 \mu\text{mol/L}$ ; carcinoma: A549,  $IC_{50} = 3 \mu\text{mol/L}$ , MCF7,  $IC_{50} = 7 \mu\text{mol/L}$ , PC3,  $IC_{50} = 8 \mu\text{mol/L}$ ). Ref: F. Lefranc, et al, JNP, 2013, 76, 1541



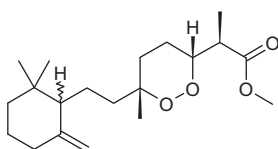
#### 464 Nuapapu A

**Type:** Simple heteroalicyclics (two O).  $C_{19}H_{32}O_4$   $[\alpha]_D = +35.2^\circ$  ( $c = 0.2$ ,  $CHCl_3$ ).  
**Source:** Sponges *Diacarnus* cf. *spinopoculum* (Solomon Is. and Papua New Guinea) and *Sigmosceptrella* sp. **Pharm:** Differential cytotoxicity (softagar assay, 50  $\mu$ g/disk, zone differential of 250 units is expected for “selectiveactivity”, C38-L<sub>1210</sub>, 300 zone differential units; M17-L<sub>1210</sub>, 0 zone differential units). **Ref:** L. V. Manes, et al, Tet. Lett., 1984, 25, 93 | S, Sperry, et al, JNP, 1998, 61, 241



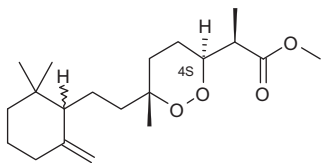
#### 465 Nuapapu B

**Type:** Simple heteroalicyclics (two O).  $C_{20}H_{34}O_4$  Oil,  $[\alpha]_D = +39^\circ$  ( $c = 1.74$ ,  $CHCl_3$ ).  
**Source:** Sponge *Diacarnus* cf. *spinopoculum* (Solomon Is. and Papua New Guinea).  
**Pharm:** Differential cytotoxicity (softagar assay, 50  $\mu$ g/disk, zone differential of 250 units is expected for “selectiveactivity”, C38-L<sub>1210</sub>, 120 zone differential units; M17-L<sub>1210</sub>, 80 zone differential units); cytotoxic (HL60,  $GI_{50} = 1.60$   $\mu$ mol/L; Molt4,  $GI_{50} > 5.0$   $\mu$ mol/L; A549/ATCC,  $GI_{50} = 0.64$   $\mu$ mol/L; KM12,  $GI_{50} = 0.40$   $\mu$ mol/L; LOX-IMVI,  $GI_{50} = 0.47$   $\mu$ mol/L; IGROV1,  $GI_{50} = 0.50$   $\mu$ mol/L; 786-0,  $GI_{50} = 0.27$   $\mu$ mol/L; BT-549,  $GI_{50} = 4.95$   $\mu$ mol/L). **Ref:** S, Sperry, et al, JNP, 1998, 61, 241

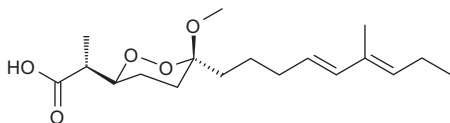


#### 466 epi-Nuapapu B

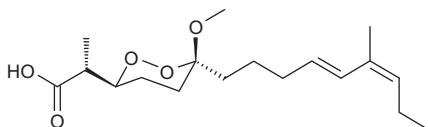
**Type:** Simple heteroalicyclics (two O).  $C_{20}H_{34}O_4$  Clear colorless oil,  $[\alpha]_D = -41.6^\circ$  ( $c = 1.5$ ,  $CHCl_3$ ). **Source:** Sponge *Diacarnus* cf. *spinopoculum* (Solomon Is. and Papua New Guinea). **Pharm:** Differential cytotoxicity (softagar assay, 50  $\mu$ g/disk, zone differential of 250 units is expected for “selectiveactivity”, M17-L<sub>1210</sub>, 50 zone differential units); cytotoxic (HL60,  $GI_{50} = 2.06$   $\mu$ mol/L; Molt4,  $GI_{50} > 5.0$   $\mu$ mol/L; A549/ATCC,  $GI_{50} > 5.0$   $\mu$ mol/L; KM12,  $GI_{50} > 5.0$   $\mu$ mol/L; IGROV1,  $GI_{50} = 1.73$   $\mu$ mol/L; 786-0,  $GI_{50} > 5.0$   $\mu$ mol/L; BT-549,  $GI_{50} > 5.0$   $\mu$ mol/L). **Ref:** S, Sperry, et al, JNP, 1998, 61, 241

**467 Peroxyplakoric acid A<sub>1</sub>**

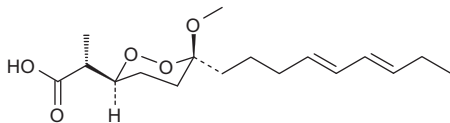
Type: Simple heteroalicyclics (two O). C<sub>18</sub>H<sub>30</sub>O<sub>5</sub> [ $\alpha$ ]<sub>D</sub> = -164° (CHCl<sub>3</sub>) (methyl ester).  
Source: Sponge *Plakortis* sp. (Okinawa). Pharm: Antifungal. Ref: M. Kobayashi, et al, CPB, 1993, 41, 1324

**468 Peroxyplakoric acid A<sub>2</sub>**

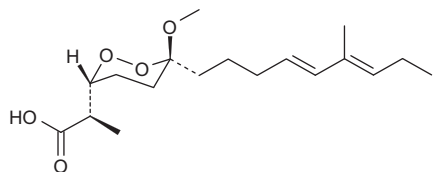
Type: Simple heteroalicyclics (two O). C<sub>18</sub>H<sub>30</sub>O<sub>5</sub> [ $\alpha$ ]<sub>D</sub> = -163° (CHCl<sub>3</sub>) (methyl ester).  
Source: Sponge *Plakortis* sp. (Okinawa). Pharm: Antifungal. Ref: M. Kobayashi, et al, CPB, 1993, 41, 1324

**469 Peroxyplakoric acid A<sub>3</sub>**

Type: Simple heteroalicyclics (two O). C<sub>17</sub>H<sub>28</sub>O<sub>5</sub> [ $\alpha$ ]<sub>D</sub> = -167° (CHCl<sub>3</sub>, as Me ester).  
Source: Sponge *Plakortis* sp. (Okinawa). Pharm: Antifungal. Ref: M. Kobayashi, et al, CPB, 1993, 41, 1324

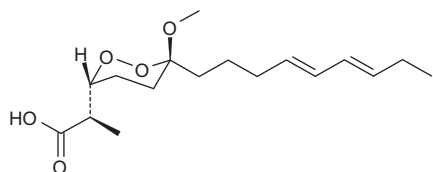
**470 Peroxyplakoric acid B<sub>1</sub>**

Type: Simple heteroalicyclics (two O). C<sub>18</sub>H<sub>30</sub>O<sub>5</sub> [ $\alpha$ ]<sub>D</sub> = -197° (CHCl<sub>3</sub>, as Me ester).  
Source: Sponge *Plakortis* sp. (Okinawa). Pharm: Antifungal. Ref: M. Kobayashi, et al, CPB, 1993, 41, 1324



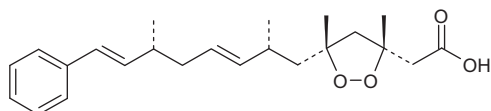
#### 471 Peroxyplakoric acid B<sub>3</sub>

Type: Simple heteroalicyclics (two O). C<sub>17</sub>H<sub>28</sub>O<sub>5</sub> [α]<sub>D</sub> = -191° (CHCl<sub>3</sub>, as Me ester). Source: Sponge *Plakortis* sp. (Okinawa). Pharm: Antifungal. Ref: M. Kobayashi, et al, CPB, 1993, 41, 1324



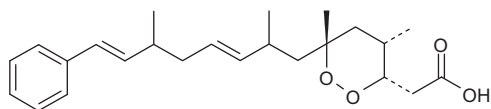
#### 472 Plakinic acid A

Type: Simple heteroalicyclics (two O). C<sub>23</sub>H<sub>32</sub>O<sub>4</sub> [α]<sub>D</sub><sup>21</sup> = -57.8° (Me ester). Source: An unidentified sponge (family Plakinidae, Caribbean Sea). Pharm: Antifungal (*in vitro*, 100 μg/disk, *Saccharomyces cerevisiae*, IZD = 24 mm; *P. atrouenetum*, IZD = 25 mm). Ref: D. W. Jr. Phillipson, et al, JACS, 1983, 105, 7735 | P. Dai, et al, JOC, 2006, 71, 2283



#### 473 Plakinic acid B

Type: Simple heteroalicyclics (two O). C<sub>24</sub>H<sub>34</sub>O<sub>4</sub> Source: An unidentified sponge (family Plakinidae, Caribbean Sea). Pharm: Antifungal (*in vitro*, 100 μg/disk, *Saccharomyces cerevisiae*, IZD = 20 mm; *P. atrouenetum*, IZD = 18 mm). Ref: D. W. Jr. Phillipson, et al, JACS, 1983, 105, 7735

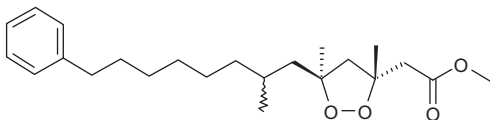


#### 474 *epi*-Plakinic acid E methyl ester

Type: Simple heteroalicyclics (two O). C<sub>23</sub>H<sub>36</sub>O<sub>4</sub> Oil, [α]<sub>D</sub> = +7.5° (c = 0.6, CDCl<sub>3</sub>). Source: Sponge *Plakinastrella onkodes* (Gulf of Mexico). Pharm: Cytotoxic (A549,

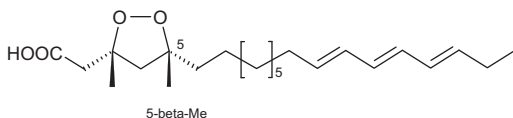


$IC_{50} = 2.0 \mu\text{g/mL}$ ;  $P_{388}$ ,  $IC_{50} = 2.5 \mu\text{g/mL}$ ); inhibits cell adhesion (EL-4,  $IC_{50} = 4.6 \mu\text{g/mL}$ ). Ref: P. A. Horton, et al, JNP, 1994, 57, 1374



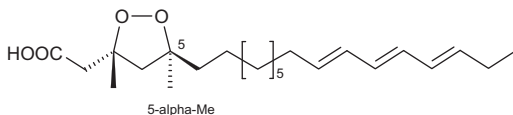
#### 475 Plakinic acid F

Type: Simple heteroalicyclics (two O).  $C_{23}H_{38}O_4$  Oil. Source: Sponge *Plakinastrella* sp. (Seychelles). Pharm: Antifungal (yeast *Candida albicans*, MIC = 25  $\mu\text{g/mL}$  (SDB media), MIC = 3.1  $\mu\text{g/mL}$  (RPMI media); *Aspergillus fumigatus*,  $IC_{90} = 25 \mu\text{g/mL}$ ). Ref: Y. Chen, et al, JNP, 2001, 64, 262



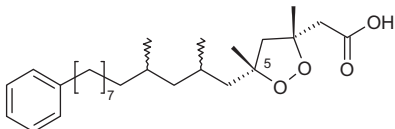
#### 476 epi-Plakinic acid F

Type: Simple heteroalicyclics (two O).  $C_{23}H_{38}O_4$  Source: Sponge *Plakinastrella* sp. (Seychelles). Pharm: Antifungal (yeast *Candida albicans*, MIC = 25  $\mu\text{g/mL}$  (SDB media), MIC = 6.5  $\mu\text{g/mL}$  (RPMI media); *Aspergillus fumigatus*,  $IC_{90} = 25 \mu\text{g/mL}$ ). Ref: Y. Chen, et al, JNP, 2001, 64, 262



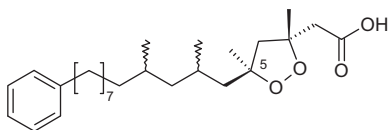
#### 477 Plakinic acid G

epi-Plakinic acid H Type: Simple heteroalicyclics (two O).  $C_{27}H_{44}O_4$  Oil,  $[\alpha]_D = +33^\circ$  ( $c = 0.07$ , MeOH). Source: Sponge *Plakortis nigra* (Palau, Oceania, depth of 380 ft). Pharm: Cytotoxic (HCT116,  $IC_{50} = 0.39 \mu\text{mol/L}$ ). Ref: J. S. Sandler, et al, JNP, 2002, 65, 1258

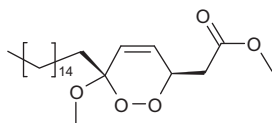


**478 epi-Plakinic acid G**

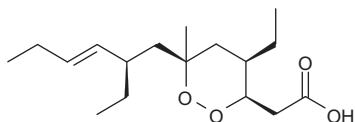
**Type:** Simple heteroalicyclics (two O).  $C_{27}H_{44}O_4$  Oil,  $[\alpha]_D = -17.2^\circ$  ( $c = 0.3$ , MeOH). **Source:** Sponge *Plakortis nigra* (Palau, Oceania, depth of 380 ft). **Pharm:** Cytotoxic (HCT116,  $IC_{50} = 0.16 \mu\text{mol/L}$ ). **Ref:** J. S. Sandler, et al, JNP, 2002, 65, 1258

**479 Plakorin**

**6-epi-Chondrillin Type:** Simple heteroalicyclics (two O).  $C_{24}H_{44}O_5$  Solid, mp 42.5–43.5 °C,  $[\alpha]_D^{30} = +30.5^\circ$  ( $c = 1.09$ ,  $CHCl_3$ ),  $[\alpha]_D^{27} = +44.3^\circ$  ( $c = 0.2$ ,  $CHCl_3$ );  $[\alpha]_D = +26^\circ$  ( $c = 0.5$ , MeOH). **Source:** Sponges *Plakortis simplex* (Taiwan waters) and *Plakortis* spp. **Pharm:**  $Ca^{2+}$ -ATPase activator; cytotoxic (L1210,  $IC_{50} = 0.85 \mu\text{g/mL}$ ; KB,  $IC_{50} = 1.8 \mu\text{g/mL}$ ). **Ref:** S. Sakemi, et al, Tetrahedron, 1987, 43, 263 | T. Murayama, et al, Experientia, 1989, 45, 898 | P. H. Dussault, et al, JACS, 1997, 119, 3824 | P. H. Dussault, et al, JOC, 1999, 64, 1789 | Y. C. Shen, et al, JNP, 2001, 64, 324

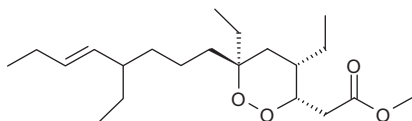
**480 Plakortic acid**

**Type:** Simple heteroalicyclics (two O).  $C_{17}H_{30}O_4$  **Source:** Sponges *Plakortis halichondrioides* (Jamaica) and *Plakortis zygompha*. **Pharm:** Antibacterial; antifungal. **Ref:** D. W. Phillipson, et al, JACS, 1983, 105, 7735 | A. Rudi, et al, JNP, 1993, 56, 1827

**481 Plakortide F**

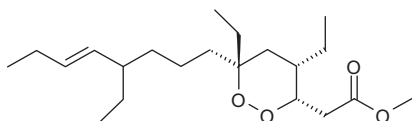
**Type:** Simple heteroalicyclics (two O).  $C_{21}H_{38}O_4$  Oil (Me ester),  $[\alpha]_D = -161.6^\circ$  ( $c = 0.04$ ,  $CHCl_3$ ). **Source:** Sponge *Plakortis halichondrioides* (Jamaica). **Pharm:** Cardiac SR- $Ca^{2+}$ -Pumping ATPase activator; antiplasmodial (*Plasmodium falciparum* D6 clone, *in vitro*,  $IC_{50} = 480 \text{ ng/mL}$ , control Artemisinin,  $IC_{50} = 12 \text{ ng/mL}$ ; CRPF W2 clone, *in vitro*,  $IC_{50} = 390 \text{ ng/mL}$ , control Artemisinin,  $IC_{50} = 7 \text{ ng/mL}$ ); cytotoxic (P388,  $IC_{50} = 1.25 \mu\text{g/mL}$ ; HT29,  $IC_{50} = 1.25 \mu\text{g/mL}$ , control Tamoxifen,  $IC_{50} = 1.86 \mu\text{g/mL}$ ; A549,  $IC_{50} = 2.5 \mu\text{g/mL}$ , control Tamoxifen,  $IC_{50} = 1.86 \mu\text{g/mL}$ );

MEL28,  $IC_{50} = 2.5 \mu\text{g/mL}$ , control Tamoxifen,  $IC_{50} = 1.86 \mu\text{g/mL}$ ; hmn primary tumor cells,  $IC_{50} = 3.4\text{--}3.9 \mu\text{g/mL}$ , control Doxorubicin,  $IC_{50} = 25 \text{ nmol/L}$ ; anti-HIV ( $EC_{50} = 13\text{--}42 \mu\text{mol/L}$ , control AZT,  $EC_{50} = 0.004 \mu\text{mol/L}$ ); Anti-hepatitis-B ( $EC_{50} > 100 \mu\text{g/mL}$ , control 3TC,  $EC_{50} = 0.062\text{--}0.065 \mu\text{g/mL}$ ); antituberculosis (*Mycobacterium tuberculosis*, InRt = 29% at  $6.25 \mu\text{g/mL}$ , control Rifampin, MIC =  $0.25 \mu\text{g/mL}$ ); antitoxoplasma (*Toxoplasma gondii*, InRt = 67% at  $1 \mu\text{mol/L}$ , control Atovaquone, InRt = 100% at  $1 \mu\text{mol/L}$ ). Ref: A. D. Patil, et al, JNP, 1996, 59, 219 | A. D. Patil, et al, Tetrahedron, 1996, 52, 377 | D. J. Gochfeld, et al, JNP, 2001, 64, 1477



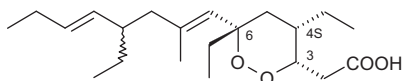
#### 482 Plakortide G

Type: Simple heteroalicyclics (two O).  $C_{21}H_{38}O_4$  Oil (Me ester),  $[\alpha]_D^{25} = +67.2^\circ$  (Me ester). Source: Sponge *Plakortis halichondrioides* (Jamaica). Pharm: Cardiac SR- $Ca^{2+}$ -Pumping ATPase activator; cytotoxic ( $P_{388}$ ,  $IC_{50} = 0.5 \mu\text{g/mL}$ ). Ref: A. Rudi, et al, JNP, 1993, 56, 1827 | A. D. Patil, et al, JNP, 1996, 59, 219 | A. D. Patil, et al, Tetrahedron, 1996, 52, 377



#### 483 (4S)-Plakortide H

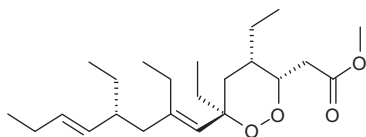
Type: Simple heteroalicyclics (two O).  $C_{22}H_{38}O_4$  Oil (Me ester),  $[\alpha]_D^{25} = +5.5^\circ$  ( $c = 2.9$ ,  $CHCl_3$ ) (Me ester). Source: Sponge *Plakortis halichondrioides* (Jamaica) and *Plakortis simplex*. Pharm: Cardiac SR- $Ca^{2+}$ -Pumping ATPase activator. Ref: A. D. Patil, et al, JNP, 1996, 59, 219 | A. D. Patil, et al, Tetrahedron, 1996, 52, 377



#### 484 Plakortide P

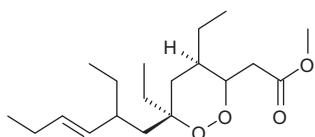
Type: Simple heteroalicyclics (two O).  $C_{23}H_{40}O_4$  Oil,  $[\alpha]_D^{24} = -275^\circ$  ( $c = 0.52$ ,  $CHCl_3$ ). Source: Sponge *Plakortis angulospiculatus* (Brazil). Pharm: Antileishmanial and anti-trypanosomal (*Leishmania chagasi* and *Trypanosoma cruzi*,  $IC_{50} = 0.5\text{--}2.3 \mu\text{g/mL}$ , though not involving nitric oxide); anti-inflammatory (modulation of LPS-activated

brain microglia *in vitro*,  $IC_{50} = 0.93 \mu\text{mol/L}$ , MMOA:  $\text{TXB}_2$  inhibition). Ref: M. H. Kossuga, et al, JNP, 2008,71, 334



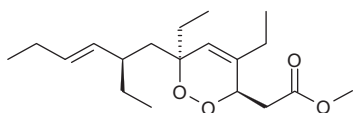
#### 485 Plakortide Q

Type: Simple heteroalicyclics (two O).  $C_{19}H_{34}O_4$  Oil,  $[\alpha]_D^{25} = +10.3^\circ$  ( $c = 2.5$ ,  $\text{CHCl}_3$ ). Source: Sponge *Plakortis simplex*. Pharm: Antimalarial (*Plasmodium falciparum* D10 and W2,  $IC_{50} = 0.5\text{--}1 \mu\text{mol/L}$ ). Ref: C. Campagnuolo, et al, EurJOC, 2005, 5077



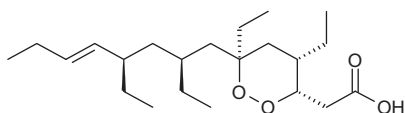
#### 486 Plakortide R

Type: Simple heteroalicyclics (two O).  $C_{19}H_{32}O_4$  Light yellow oil,  $[\alpha]_D^{25} = -29.8^\circ$  ( $c = 0.26$ ,  $\text{CHCl}_3$ ). Source: Sponge *Plakinastrella mamillaris* (Fiji). Pharm: Antiplasmodial ( $[^3\text{H}]$ -hypoxanthine (Amersham-France) incorporation method, CRPF FcM29 strain,  $IC_{50} = 5\text{--}50 \mu\text{mol/L}$ , less active than Plakortide U). Ref: C. Festa, et al, Tetrahedron, 2013, 69, 3706



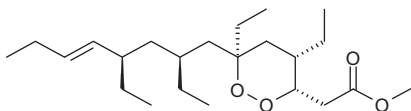
#### 487 Plakortide S

Type: Simple heteroalicyclics (two O).  $C_{22}H_{40}O_4$  Light yellow oil,  $[\alpha]_D^{25} = -149.8^\circ$  ( $c = 3.45$ ,  $\text{CHCl}_3$ ). Source: Sponge *Plakinastrella mamillaris* (Fiji). Pharm: Antiplasmodial ( $[^3\text{H}]$ -hypoxanthine (Amersham-France) incorporation method, CRPF FcM29 strain,  $IC_{50} = 5\text{--}50 \mu\text{mol/L}$ , less active than Plakortide U). Ref: C. Festa, et al, Tetrahedron, 2013, 69, 3706

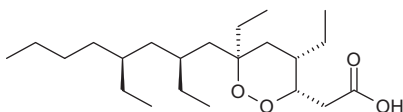


**488 Plakortide T**

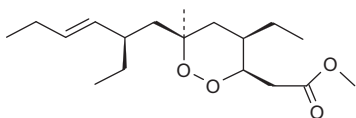
**Type:** Simple heteroalicyclics (two O). C<sub>23</sub>H<sub>42</sub>O<sub>4</sub> Light yellow oil,  $[\alpha]_D^{25} = -144.6^\circ$  ( $c = 0.13$ , CHCl<sub>3</sub>). **Source:** Sponge *Plakinastrella mamillaris* (Fiji). **Pharm:** Antiplasmodial (<sup>3</sup>H]-hypoxanthine (Amersham-France) incorporation method, CRPF FcM29 strain, IC<sub>50</sub> = 5–50 μmol/L, less active than Plakortidn U). **Ref:** C. Festa, et al, Tetrahedron, 2013, 69, 3706

**489 Plakortide U**

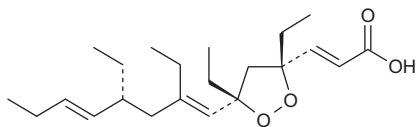
**Type:** Simple heteroalicyclics (two O). C<sub>22</sub>H<sub>42</sub>O<sub>4</sub> Light yellow oil,  $[\alpha]_D^{25} = -109.0^\circ$  ( $c = 0.09$ , CHCl<sub>3</sub>). **Source:** Sponge *Plakinastrella mamillaris* (Fiji). **Pharm:** Antiplasmodial (<sup>3</sup>H]-hypoxanthine (Amersham-France) incorporation method, CRPF FcM29 strain, IC<sub>50</sub> = 0.80 μmol/L). **Ref:** C. Festa, et al, Tetrahedron, 2013, 69, 3706

**490 Plakortin**

**Type:** Simple heteroalicyclics (two O). C<sub>18</sub>H<sub>32</sub>O<sub>4</sub>  $[\alpha]_D^{20} = +189^\circ$  ( $c = 2.9$ , CHCl<sub>3</sub>), Sol. MeOH, C<sub>6</sub>H<sub>6</sub>. **Source:** Sponges *Plakortis simplex* (Caribbean Sea Sea) and *Plakortis halichondrioides*. **Pharm:** Cytotoxic (WEHI-164, IC<sub>50</sub> = 7.0 μg/mL); antiplasmodial (*Plasmodium falciparum* D10 and W2, MMOA: toxic carbon-radical). **Ref:** M. D. Higgs, et al, JOC, 1978, 43, 3454 | F. Cafieri, et al, Tetrahedron, 1999, 55, 7045 | O. Taglialatela-Scafati, et al, Org. Biomol. Chem., 2010, 8, 846

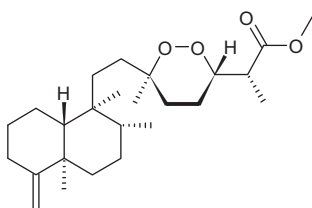
**491 Plakortisinic acid**

**Type:** Simple heteroalicyclics (two O). C<sub>22</sub>H<sub>36</sub>O<sub>4</sub> Yellow oil,  $[\alpha]_D^{25} = +120^\circ$  ( $c = 0.1$ , CHCl<sub>3</sub>). **Source:** Sponge *Plakortis cf. angulospiculatus* (Jamaica). **Pharm:** Antifungal. **Ref:** R. Mohammed, et al, Aust. J. Chem., 2010, 63, 877



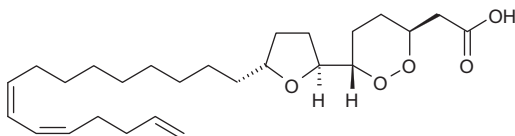
#### 492 Sigmoseptrellin B methyl ester

**Type:** Simple heteroalicyclics (two O).  $C_{25}H_{42}O_4$  **Source:** Sponge *Diacarnus erythraeanus* (Elfanadir, Hurghada, Egypt). **Pharm:** Cytotoxic (glioma: Hs683,  $IC_{50} = 35 \mu\text{mol/L}$ , U373,  $IC_{50} = 53 \mu\text{mol/L}$ , U251,  $IC_{50} = 54 \mu\text{mol/L}$ ; melanoma: SK-MEL-28,  $IC_{50} = 44 \mu\text{mol/L}$ ; carcinoma: A549,  $IC_{50} = 24 \mu\text{mol/L}$ , MCF7,  $IC_{50} = 36 \mu\text{mol/L}$ , PC3,  $IC_{50} = 44 \mu\text{mol/L}$ ). **Ref:** F. Lefranc, et al, JNP, 2013, 76, 1541



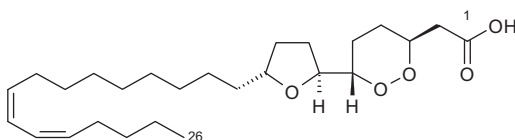
#### 493 Stolonic acid A

**Type:** Simple heteroalicyclics (two O).  $C_{26}H_{42}O_5$  Pale yellow oil,  $[\alpha]_D = -30.5^\circ$  ( $c = 0.43$ ,  $\text{CHCl}_3$ ). **Source:** Ascidian *Stolonica* sp. **Pharm:** Cytotoxic (LOX and OVCAR-3,  $IC_{50} = 0.05 \mu\text{g/mL}$ ). **Ref:** M. T. Davies-Coleman, et al, JNP, 2000, 63, 1411



#### 494 Stolonic acid B

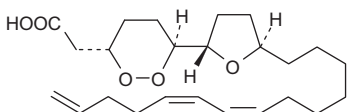
**Type:** Simple heteroalicyclics (two O).  $C_{26}H_{44}O_5$  Pale yellow oil,  $[\alpha]_D = -18.4^\circ$  ( $c = 0.42$ ,  $\text{CHCl}_3$ ). **Source:** Ascidian *Stolonica* sp. **Pharm:** Cytotoxic (LOX and OVCAR-3,  $IC_{50} = 0.09 \mu\text{g/mL}$ ). **Ref:** M. T. Davies-Coleman, et al, JNP, 2000, 63, 1411



#### 495 Stolonoxide A

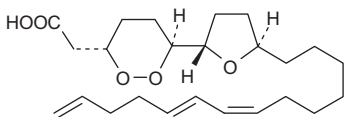
3,6-Epidioxy-7,10-epoxy-17,19,23-tetracosatrienoic acid **Type:** Simple heteroalicyclics (two O).  $C_{24}H_{38}O_5$  Colorless oil,  $[\alpha]_D^{25} = -50.8^\circ$  ( $c = 0.39$ ,  $\text{CHCl}_3$ ). **Source:** Ascidian

*Stolonica socialis* (Tarifa I., Cádiz, Spain). **Pharm:** Cytotoxic (9:1 mixture of stolonoxide A and stolonoxide B, P<sub>388</sub>, IC<sub>50</sub> = 0.01 µg/mL; A549, IC<sub>50</sub> = 0.10 µg/mL; HT29, IC<sub>50</sub> = 0.10 µg/mL; MEL28, IC<sub>50</sub> = 0.10 µg/mL; DU145, IC<sub>50</sub> = 0.10 µg/mL; control Doxorubicin, P<sub>388</sub>, IC<sub>50</sub> = 0.02 µg/mL; A549, IC<sub>50</sub> = 0.002 µg/mL; HT29, IC<sub>50</sub> = 0.05 µg/mL; MEL28, IC<sub>50</sub> = 0.02 µg/mL). **Ref:** R. Durán, et al, Tetrahedron, 2000, 56, 6031 | A. Fontana, et al, Tet. Lett., 2000, 41, 429



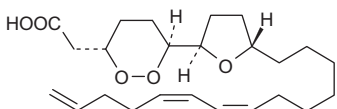
#### 496 Stolonoxide B

**Type:** Simple heteroalicyclics (two O). C<sub>24</sub>H<sub>38</sub>O<sub>5</sub> Colorless oil, [α]<sub>D</sub><sup>25</sup> = -37.7° (c = 0.26, CHCl<sub>3</sub>). **Source:** Ascidian *Stolonica socialis* (Tarifa I., Cádiz, Spain). **Pharm:** Cytotoxic (9:1 mixture of stolonoxide A and stolonoxide B, P<sub>388</sub>, IC<sub>50</sub> = 0.01 µg/mL; A549, IC<sub>50</sub> = 0.10 µg/mL; HT29, IC<sub>50</sub> = 0.10 µg/mL; MEL28, IC<sub>50</sub> = 0.10 µg/mL; DU145, IC<sub>50</sub> = 0.10 µg/mL; control Doxorubicin, P<sub>388</sub>, IC<sub>50</sub> = 0.02 µg/mL; A549, IC<sub>50</sub> = 0.002 µg/mL; HT29, IC<sub>50</sub> = 0.05 µg/mL; MEL28, IC<sub>50</sub> = 0.02 µg/mL); inhibits mitochondrial respiratory chain (potent). **Ref:** A. Fontana, et al, Tet. Lett., 2000, 41, 429 | R. Durán, et al, Tetrahedron, 2000, 56, 6031 | A. Fontana, et al, JMC, 2001, 44, 2362



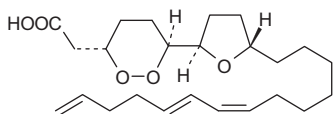
#### 497 Stolonoxide C

**Type:** Simple heteroalicyclics (two O). C<sub>24</sub>H<sub>38</sub>O<sub>5</sub> **Source:** Ascidian *Stolonica socialis* (Tarifa I., Cádiz, Spain). **Pharm:** Cytotoxic (6:4 mixture of stolonoxide C and stolonoxide D, P<sub>388</sub>, IC<sub>50</sub> = 0.01 µg/mL; A549, IC<sub>50</sub> = 0.01 µg/mL; HT29, IC<sub>50</sub> = 0.05 µg/mL; MEL28, IC<sub>50</sub> = 0.10 µg/mL; DU145, IC<sub>50</sub> = 0.10 µg/mL; control Doxorubicin, P<sub>388</sub>, IC<sub>50</sub> = 0.02 µg/mL; A549, IC<sub>50</sub> = 0.002 µg/mL; HT29, IC<sub>50</sub> = 0.05 µg/mL; MEL28, IC<sub>50</sub> = 0.02 µg/mL); inhibits mitochondrial respiratory chain (potent). **Ref:** A. Fontana, et al, Tet. Lett., 2000, 41, 429 | R. Durán, et al, Tetrahedron, 2000, 56, 6031 | A. Fontana, et al, JMC, 2001, 44, 2362

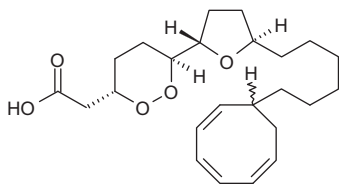


**498 Stolonoxide D**

**Type:** Simple heteroalicyclics (two O).  $C_{24}H_{38}O_5$  **Source:** Ascidian *Stolonica socialis* (Tarifa I., Cádiz, Spain). **Pharm:** Cytotoxic (6:4 mixture of stolonoxide C and stolonoxide D,  $P_{388}$ ,  $IC_{50} = 0.01 \mu\text{g/mL}$ ; A549,  $IC_{50} = 0.01 \mu\text{g/mL}$ ; HT29,  $IC_{50} = 0.05 \mu\text{g/mL}$ ; MEL28,  $IC_{50} = 0.10 \mu\text{g/mL}$ ; DU145,  $IC_{50} = 0.10 \mu\text{g/mL}$ ; control Doxorubicin,  $P_{388}$ ,  $IC_{50} = 0.02 \mu\text{g/mL}$ ; A549,  $IC_{50} = 0.002 \mu\text{g/mL}$ ; HT29,  $IC_{50} = 0.05 \mu\text{g/mL}$ ; MEL28,  $IC_{50} = 0.02 \mu\text{g/mL}$ ). **Ref:** A. Fontana, et al, Tet. Lett., 2000, 41, 429 | R. Durán, et al, Tetrahedron, 2000, 56, 6031

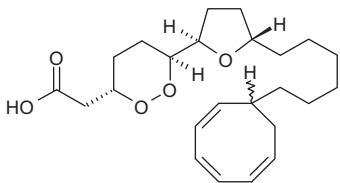
**499 Stolonoxide E**

**Type:** Simple heteroalicyclics (two O).  $C_{24}H_{36}O_5$  Oil,  $[\alpha]_D^{25} = -33.4^\circ$  ( $c = 0.09$ ,  $\text{CHCl}_3$ ). **Source:** Ascidian *Stolonica socialis*. **Pharm:** Cytotoxic (MDA-MB-231,  $GI_{50} = 4.94 \mu\text{mol/L}$ ,  $TGI = 5.44 \mu\text{mol/L}$ ,  $LC_{50} = 6.18 \mu\text{mol/L}$ , control Doxorubicin,  $GI_{50} = 0.038 \mu\text{mol/L}$ ,  $TGI = 0.31 \mu\text{mol/L}$ ,  $LC_{50} = 2.41 \mu\text{mol/L}$ ; HT29,  $GI_{50} = 3.96 \mu\text{mol/L}$ ,  $TGI = 5.19 \mu\text{mol/L}$ ,  $LC_{50} = 6.67 \mu\text{mol/L}$ , Doxorubicin,  $GI_{50} = 0.066 \mu\text{mol/L}$ ,  $TGI = 0.40 \mu\text{mol/L}$ ,  $LC_{50} = 17.2 \mu\text{mol/L}$ ; A549,  $GI_{50} = 7.91 \mu\text{mol/L}$ ,  $TGI = 8.16 \mu\text{mol/L}$ ,  $LC_{50} = 8.65 \mu\text{mol/L}$ , Doxorubicin,  $GI_{50} = 0.062 \mu\text{mol/L}$ ,  $TGI = 0.26 \mu\text{mol/L}$ ,  $LC_{50} = 1.57 \mu\text{mol/L}$ ). **Ref:** F. Reyes, et al, JNP, 2010, 73, 83

**500 Stolonoxide F**

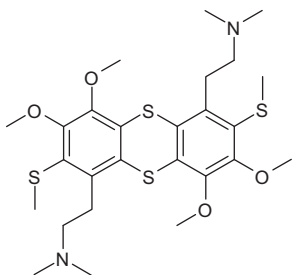
**Type:** Simple heteroalicyclics (two O).  $C_{24}H_{36}O_5$  Oil,  $[\alpha]_D^{25} = +18.5^\circ$  ( $c = 0.13$ ,  $\text{CHCl}_3$ ). **Source:** Ascidian *Stolonica socialis*. **Pharm:** Cytotoxic (MDA-MB-231,  $GI_{50} = 4.70 \mu\text{mol/L}$ ,  $TGI = 5.44 \mu\text{mol/L}$ ,  $LC_{50} = 6.18 \mu\text{mol/L}$ , control Doxorubicin,  $GI_{50} = 0.038 \mu\text{mol/L}$ ,  $TGI = 0.31 \mu\text{mol/L}$ ,  $LC_{50} = 2.41 \mu\text{mol/L}$ ; HT29,  $GI_{50} = 2.72 \mu\text{mol/L}$ ,  $TGI = 3.21 \mu\text{mol/L}$ ,  $LC_{50} = 3.71 \mu\text{mol/L}$ , Doxorubicin,  $GI_{50} = 0.066 \mu\text{mol/L}$ ,  $TGI = 0.40 \mu\text{mol/L}$ ,  $LC_{50} = 17.2 \mu\text{mol/L}$ ; A549,  $GI_{50} = 5.44 \mu\text{mol/L}$ ,  $TGI = 5.93 \mu\text{mol/L}$ ,  $LC_{50} = 6.67 \mu\text{mol/L}$ , Doxorubicin,  $GI_{50} = 0.062 \mu\text{mol/L}$ ,  $TGI = 0.26 \mu\text{mol/L}$ ,  $LC_{50} = 1.57 \mu\text{mol/L}$ ). **Ref:** F. Reyes, et al, JNP, 2010, 73, 83





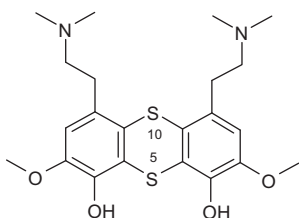
### 501 Lissoclibadin 3

**Type:** Simple heteroalicyclics (two S).  $C_{26}H_{38}N_2O_4S_4$  **Source:** Ascidian *Lissoclinum* cf. *badium*. **Pharm:** Cytotoxic (V79,  $IC_{50} = 0.34 \mu\text{mol/L}$  ( $0.19 \mu\text{g/mL}$ ), inhibits colony formation;  $L_{1210}$ ,  $IC_{50} = 2.79 \mu\text{mol/L}$  ( $1.59 \mu\text{g/mL}$ ), inhibits cell proliferation) (Wang, 2009). **Ref:** H. Liu, et al, *Tetrahedron*, 2005, 61, 8611 | W. Wang, et al, *Tetrahedron*, 2009, 65, 9598



### 502 Lissoclibadin 11

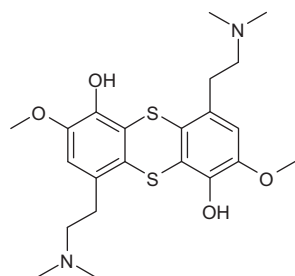
**Type:** Simple heteroalicyclics (two S).  $C_{22}H_{30}N_2O_4S_2$  Yellow film (bistrifluoroacetate salt). **Source:** Ascidian *Lissoclinum* cf. *badium* (Manado, Indonesia). **Pharm:** Cytotoxic (V79,  $IC_{50} > 20.0 \mu\text{mol/L}$  ( $> 9.0 \mu\text{g/mL}$ ), inhibits colony formation);  $L_{1210}$ ,  $IC_{50} > 20.0 \mu\text{mol/L}$  ( $> 9.0 \mu\text{g/mL}$ ), inhibits cell proliferation)). **Ref:** W. Wang, et al, *Tetrahedron*, 2009, 65, 9598



### 503 Lissoclibadin 12

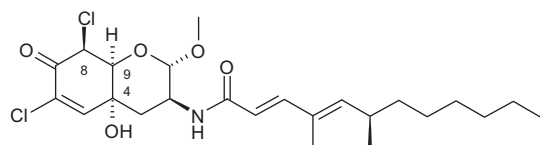
**Type:** Simple heteroalicyclics (two S).  $C_{22}H_{30}N_2O_4S_2$  Yellow film (bistrifluoroacetate salt). **Source:** Ascidian *Lissoclinum* cf. *badium* (Manado, Indonesia). **Pharm:** Cytotoxic (V79,  $IC_{50} = 7.90 \mu\text{mol/L}$  ( $3.56 \mu\text{g/mL}$ ), inhibits colony formation;  $L_{1210}$ ,

$IC_{50} > 20.0 \mu\text{mol/L}$  ( $> 9.0 \mu\text{g/mL}$ ), inhibits cell proliferation). Ref: W. Wang, et al, *Tetrahedron*, 2009, 65, 9598



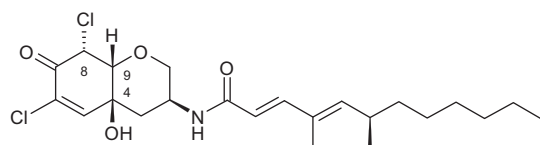
#### 504 Dankastatin A

Type: Bicycloheteroalicyclics (one O)  $C_{24}H_{35}Cl_2NO_5$  Powder, mp 169–171 °C,  $[\alpha]_D^{22} = +114.4^\circ$  ( $c = 0.18$ ,  $CHCl_3$ ). Source: Marine-derived fungus *Gymnascella dankaliensis* OUPS-N134 from sponge *Halichondria japonica* (off Osaka, Japan waters). Pharm: Cytotoxic ( $P_{388}$ , cell growth inhibitor). Ref: T. Amagata, et al, *JNP*, 2008, 71, 340



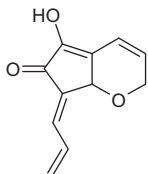
#### 505 Dankastatin B

Type: Bicycloheteroalicyclics (one O)  $C_{23}H_{33}Cl_2NO_4$  Powder, mp 90–92.5 °C,  $[\alpha]_D^{22} = -157.4^\circ$  ( $c = 0.18$ ,  $CHCl_3$ ). Source: Marine-derived fungus *Gymnascella dankaliensis* OUPS-N134 from sponge *Halichondria japonica* (off Osaka, Japan waters). Pharm: Cytotoxic ( $P_{388}$ , cell growth inhibitor). Ref: T. Amagata, et al, *JNP*, 2008, 71, 340

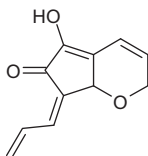


#### 506 (E)-7,7a-Dihydro-5-hydroxy-7-(2-propenylidene)cyclopenta[c]pyran-6(2H)-one

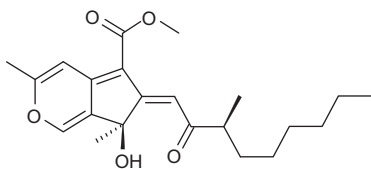
Type: Bicycloheteroalicyclics (one O)  $C_{11}H_{10}O_3$  Pale yellow powder,  $[\alpha]_D^{21} = +4.1^\circ$  ( $c = 0.15$ , MeOH), very unstable. Source: Sponge *Ulosa* sp. Pharm: Cytotoxic; antimicrobial (*in vitro*, facile polymerization). Ref: S. J. Wratten, et al, *Tet. Lett.*, 1978, 961

**507 (Z)-7,7a-Dihydro-5-hydroxy-7-(2-propenylidene)cyclopenta[c]pyran-6(2H)-one**

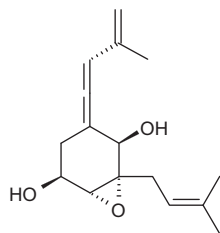
**Type:** Bicycloheteroalicyclics (one O) C<sub>11</sub>H<sub>10</sub>O<sub>3</sub> Pale yellow powder,  $[\alpha]_D^{21} = +11^\circ$  ( $c = 0.32$ , MeOH), very unstable. **Source:** Sponge *Ulosa* sp. **Pharm:** Cytotoxic; antimicrobial (*in vitro*, facile polymerization). **Ref:** S. J. Wratten, et al, Tet. Lett., 1978, 961

**508 Sequoiatone B**

**Type:** Bicycloheteroalicyclics (one O) C<sub>22</sub>H<sub>30</sub>O<sub>5</sub> Amorph. yellow solid,  $[\alpha]_D^{25} = +72.7^\circ$  ( $c = 0.11$ , MeOH). **Source:** Mangrove-derived fungus *Penicillium* sp. JP-1 from mangrove *Aegiceras corniculatum* (China waters waters). **Pharm:** Cytotoxic (breast cancer cell lines, GI<sub>50</sub> = 4–10 μmol/L with LC<sub>50</sub> > 100 μmol/L). **Ref:** Z. J. Lin, et al, Phytochemistry, 2008, 69, 1273

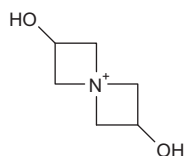
**509 Spartinoxide**

**Type:** Bicycloheteroalicyclics (one O) C<sub>16</sub>H<sub>22</sub>O<sub>3</sub> **Source:** Marine-derived fungus *Phaeosphaeria spartinae* from red alga *Ceramium* sp. (North Sea, Büsum, Germany). **Pharm:** Leukocyte elastase Inhibitor (hmn, potent). **Ref:** M. F. Elsebai, et al, Nat. Prod. Commun., 2010, 5, 1071



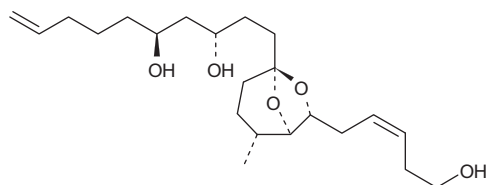
### 510 4-Azoniaspiro[3.3]heptane-2,6-diol

Type: Bicycloheteroalicyclics (one N).  $C_6H_{12}NO_2^{1+}$  Source: Green alga *Chara globularis*. Pharm: Antibacterial. Ref: U. Anthoni, et al, JOC, 1987, 52, 694



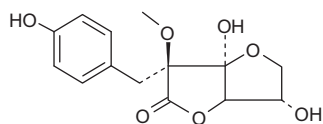
### 511 Attenol B

Type: Bicycloheteroalicyclics (two O).  $C_{22}H_{38}O_5$  Source: Bivalve Filibranch *Pinna attenuata* (China waters waters). Pharm: Cytotoxic ( $P_{388}$ ,  $IC_{50} = 12 \mu\text{g/mL}$ ). Ref: N. Takada, et al, Chem. Lett., 1999, 1025 | K. Suenaga, et al, Org. Lett., 2001, 3, 527



### 512 Delessierine

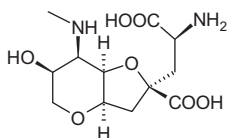
Type: Bicycloheteroalicyclics (two O).  $C_{14}H_{16}O_7$  Cryst. (MeOH), mp 117 °C,  $[\alpha]_D^{20} = +36^\circ$  ( $c = 0.72$ , MeOH). Source: Red alga *Delessieria sanguinea*. Pharm: Anticoagulant. Ref: J. -C. Yvin, et al, JACS, 1982, 104, 4497



### 513 Dysiherbaine

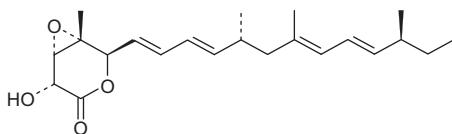
Type: Bicycloheteroalicyclics (two O).  $C_{12}H_{20}N_2O_7$   $[\alpha]_D^{25} = -3.5^\circ$  ( $c = 0.4$ ,  $H_2O$ ). Source: Sponge *Dysidea herbacea* (Yap, Federated States of Micronesia). Pharm:

Neurotoxin (inhibits on rat brain synaptic membranes, bindings of [<sup>3</sup>H]KA, IC<sub>50</sub> = (59 ± 7.8)nmol/L and [<sup>3</sup>H]AMPA, IC<sub>50</sub> = (224 ± 22)nmol/L, but not [<sup>3</sup>H]CGS-19755, an NMDA antagonist (IC<sub>50</sub> > 10,000 nmol), results indicate Dysiherbaine is a selective agonist of non-NMDA type glutamate receptors in CNS). Ref: R. Sakai, et al, JACS, 1997, 119, 4112



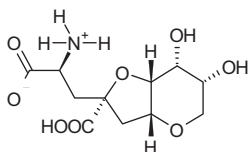
### 514 Nafuredin

Type: Bicycloheteroalicyclics (two O). C<sub>22</sub>H<sub>32</sub>O<sub>4</sub> Powder, mp 105 °C, [α]<sub>D</sub><sup>25</sup> = +35.3°, [α]<sub>D</sub><sup>25</sup> = +89.9° (c = 0.1, CHCl<sub>3</sub>). Source: Marine-derived fungus *Aspergillus niger* from an unidentified sponge (Palau, Oceania, Oceania). Pharm: Anaerobic electron transport inhibitor; NADH-fumarate reductase (NFRD) inhibitor (pig roundworm *Ascaris suum*, highly selective). Ref: H. Ui, et al, J. Antibiot., 2001, 54, 234



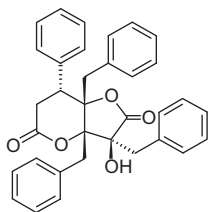
### 515 Neodysiherbaine A

Type: Bicycloheteroalicyclics (two O). C<sub>11</sub>H<sub>17</sub>NO<sub>8</sub> Pale yellow solid, [α]<sub>D</sub><sup>23</sup> = -6.5° (c = 0.75, H<sub>2</sub>O). Source: Sponge *Dysidea herbacea* (Federated States of Micronesia). Pharm: Neurologically-active (potent). Ref: R. Sakai, et al, Org. Lett., 2001, 3, 1479



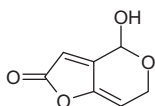
### 516 Ophiodilactone A

Type: Bicycloheteroalicyclics (two O). C<sub>34</sub>H<sub>30</sub>O<sub>5</sub> Yellow powder, [α]<sub>D</sub><sup>21</sup> = -67° (c = 0.07, MeOH). Source: Ophiuroid *Ophiocoma scolopendrina* (inter-tidal). Pharm: Cytotoxic (P<sub>388</sub>, IC<sub>50</sub> = 5.0 μg/mL). Ref: R. Ueoka, et al, JOC, 2009, 74, 4396



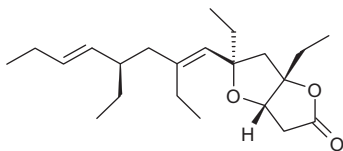
### 517 Patulin

**Type:** Bicycloheteroalicyclics (two O).  $C_7H_6O_4$  Prisms or plates (Et<sub>2</sub>O or CHCl<sub>3</sub>), mp 111 °C,  $[\alpha]_D^{21} = -6.2^\circ$  (CHCl<sub>3</sub>). **Source:** Marine-derived fungi *Penicillium* sp. OUPS-79 from green alga *Enteromorpha intestinalis* and *Aspergillus varians*. **Pharm:** Cytotoxic (P<sub>388</sub>, ED<sub>50</sub> = 0.06 µg/mL; BSY1, ED<sub>50</sub> = 0.04 µg/mL; MCF7, ED<sub>50</sub> = 0.65 µg/mL; HCC2998, ED<sub>50</sub> = 1.54 µg/mL; NCI-H522, ED<sub>50</sub> = 0.30 µg/mL; DMS114, ED<sub>50</sub> = 0.57 µg/mL; OVCAR-3, ED<sub>50</sub> = 0.37 µg/mL; MKN1, ED<sub>50</sub> = 0.39 µg/mL); seed germination inhibitor; antibacterial; hepatitis C virus protease inhibitor; mycotoxin; LD<sub>50</sub> (rat, orl) = 27.8 mg/kg **Ref:** C. Iwamoto, et al, Tetrahedron, 1999, 55, 14353



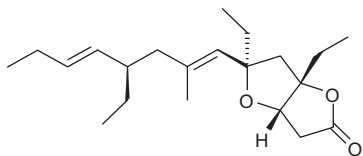
### 518 Plakortone A

**Type:** Bicycloheteroalicyclics (two O).  $C_{22}H_{36}O_3$   $[\alpha]_D^{25} = -21.1^\circ$  ( $c = 0.038$ , CHCl<sub>3</sub>). **Source:** Sponge *Plakortia halichondrioides* (Jamaica). **Pharm:** Cardiac SR-Ca<sup>2+</sup>-Pumping ATPase activator. **Ref:** A. D. Patil, et al, JNP, 1996, 59, 219 | A. D. Patil, et al, Tetrahedron, 1996, 52, 377

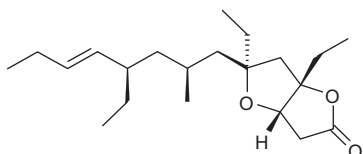


### 519 Plakortone B

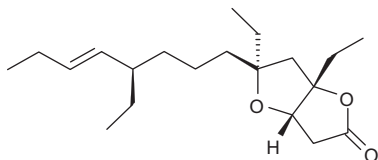
**Type:** Bicycloheteroalicyclics (two O).  $C_{21}H_{34}O_3$  Oil,  $[\alpha]_D^{25} = -9.2^\circ$  ( $c = 0.7$ , CHCl<sub>3</sub>). **Source:** Sponge *Plakortia halichondrioides* (Jamaica). **Pharm:** Cardiac SR-Ca<sup>2+</sup>-Pumping ATPase activator. **Ref:** A. D. Patil, et al, JNP, 1996, 59, 219 | A. D. Patil, et al, Tetrahedron, 1996, 52, 377

**520 Plakortone C**

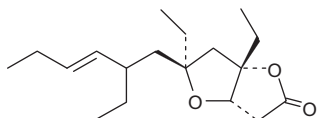
**Type:** Bicycloheteroalicyclics (two O).  $C_{21}H_{36}O_3$  Oil,  $[\alpha]_D^{25} = -24.9^\circ$  ( $c = 1.23$ ,  $CHCl_3$ ). **Source:** Sponge *Plakortia halichondrioides* (Jamaica). **Pharm:** Cardiac  $SR-Ca^{2+}$ -Pumping ATPase activator. **Ref:** A. D. Patil, et al, JNP, 1996, 59, 219 | A. D. Patil, et al, Tetrahedron, 1996, 52, 377

**521 Plakortone D**

**Type:** Bicycloheteroalicyclics (two O).  $C_{20}H_{34}O_3$  Oil,  $[\alpha]_D^{25} = -26.3^\circ$  ( $c = 1.27$ ,  $CHCl_3$ ). **Source:** Sponge *Plakortia halichondrioides* (Jamaica). **Pharm:** Cardiac  $SR-Ca^{2+}$ -Pumping ATPase activator. **Ref:** A. D. Patil, et al, JNP, 1996, 59, 219 | A. D. Patil, et al, Tetrahedron, 1996, 52, 377

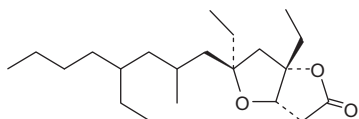
**522 Plakortone E**

**Type:** Bicycloheteroalicyclics (two O).  $C_{18}H_{30}O_3$  Oil,  $[\alpha]_D^{25} = -10^\circ$  ( $c = 0.001$ ,  $CHCl_3$ ). **Source:** Sponge *Plakortia simplex* (Caribbean Sea Sea). **Pharm:** Cytotoxic (WEHI-164,  $IC_{50} = 8.0 \mu g/mL$ ). **Ref:** F. Cafieri, et al, Tetrahedron, 1999, 55, 13831

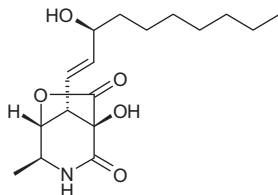


**523 Plakortone F**

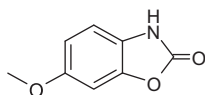
Type: Bicycloheteroalicyclics (two O).  $C_{21}H_{38}O_3$  Oil,  $[\alpha]_D^{25} = -11^\circ$  ( $c = 0.001$ ,  $CHCl_3$ ).  
Source: Sponge *Plakortis simplex* (Caribbean Sea). Pharm: Cytotoxic (WEHI-164,  $IC_{50} = 11.0 \mu\text{g/mL}$ ). Ref: F. Cafieri, et al, Tetrahedron, 1999, 55, 13831

**524 Awajanomycin**

Type: Bicycloheteroalicyclics (one O, one N).  $C_{17}H_{27}NO_5$  Gum,  $[\alpha]_D^{25} = +78^\circ$  ( $c = 0.1$ , MeOH). Source: Marine-derived fungus *Acremonium* sp. AWA16-1 (from sea mud sample, Japan waters). Pharm: Cytotoxic (A549, moderate). Ref: J. -H. Jang, et al, JNP, 2006, 69, 1358

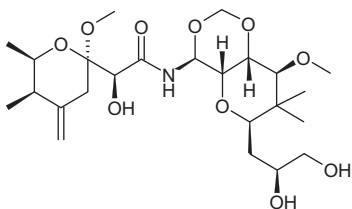
**525 Coixol**

6-Methoxy-2(3*H*)-benzoxazolinone Type: Bicycloheteroalicyclics (one O, one N).  $C_8H_7NO_3$  Source: Sponge *Oceanapia* sp. (India waters), terrestrial plants (wheat *Triticum aestivum*, corn *Zea mays*, rye *Secale cereal* and *Coix lacryma jobi* roots). Pharm: Toxic (brine shrimp). Ref: Y. Venkateswarlu, et al, Biochem. Syst. EcoL, 1999, 27, 519

**526 Mycalamide A**

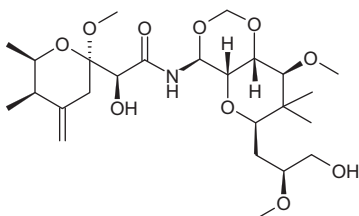
Type: Bicycloheteroalicyclics (three O).  $C_{24}H_{41}NO_{10}$  Oil,  $[\alpha]_{365.00} = +110^\circ$  ( $c = 0.2$ ,  $CHCl_3$ ). Source: Sponges *Mycale* sp. and *Stylinos* sp. Pharm: Cytotoxic ( $P_{388}$ ,  $IC_{50} = 1.1 \text{ ng/mL}$ ) (Simpson, 2000); cytotoxic (LLC-PK<sub>1</sub>,  $IC_{50} = (0.65 \pm 0.27) \text{ nmol/L}$ ; H441,  $IC_{50} = (0.46 \pm 0.14) \text{ nmol/L}$ ; SH-SY5Y,  $IC_{50} = (0.52 \pm 0.22) \text{ nmol/L}$ ) (Lyndon, 2000); antineoplastic (undergoing preclinical trials at U.S. Natl. Cancer Inst., 1994). Ref: N. B. Perry, et al, JOC, 1990, 55, 223 | C. Y. Hong, et al, JOC, 1990, 55, 4242 | J. S. Simpson, et al, JNP, 2000, 63, 704 | M. W. Lyndon, et al, JNP, 2000, 63, 707 | K. A. Hood, et al, Apoptosis, 2001, 6, 207





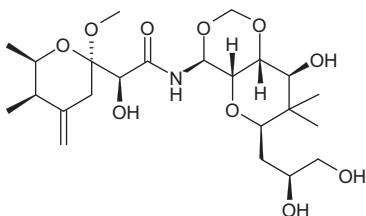
### 527 Mycalamide B

**Type:** Bicycloheteroalicyclics (three O).  $C_{25}H_{43}NO_{10}$  Oil,  $[\alpha]_D = +39^\circ$  ( $c = 0.2$ ,  $CHCl_3$ ).  
**Source:** Sponge *Mycale* sp. (New Zealand). **Pharm:** Antiviral (minimum active dose 1–2 ng/disk); cytotoxic ( $P_{388}$ ,  $IC_{50} = (0.7 \pm 0.3)ng/mL$ ); antineoplastic ( $P_{388}$ ). **Ref:** N. B. Perry, et al, JOC, 1990, 55, 223 | P. J. Kocienski, et al, Synlett, 1998, 869 | P. J. Kocienski, et al, Synlett, 1998, 1432



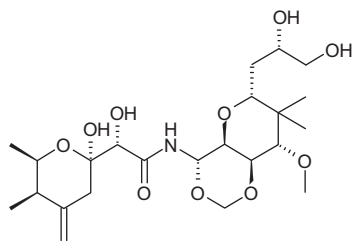
### 528 Mycalamide D

**Type:** Bicycloheteroalicyclics (three O).  $C_{23}H_{39}NO_{10}$  Oil,  $[\alpha]_D^{20} = +41^\circ$  ( $c = 0.3$ ,  $CHCl_3$ ). **Source:** Sponges *Mycale* sp. and *Stylinos* sp. **Pharm:** Cytotoxic ( $P_{388}$ ,  $IC_{50} = 35 ng/mL$ ) (Simpson, 2000); cytotoxic (LLC-PK<sub>1</sub>,  $IC_{50} = (19.43 \pm 10.76)nmol/L$ ; H441,  $IC_{50} = (9.30 \pm 3.96)nmol/L$ ; SH-SY5Y,  $IC_{50} = (6.42 \pm 1.65)nmol/L$ ) (Lyndon, 2000). **Ref:** J. S. Simpson, et al, JNP, 2000, 63, 704 | M. W. Lyndon, et al, JNP, 2000, 63, 707



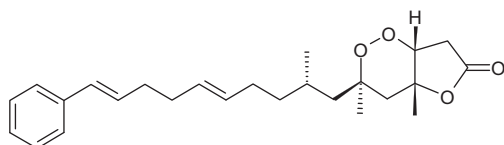
### 529 Mycalamide E

**Type:** Bicycloheteroalicyclics (three O).  $C_{23}H_{39}NO_{10}$  **Source:** Sponge *Mycale hentscheli* (PelorusSound, New Zealand). **Pharm:** Protein synthesis inhibitor. **Ref:** V. Venturi, et al, J. Biochem. Mol. Toxicol., 2012, 26, 94



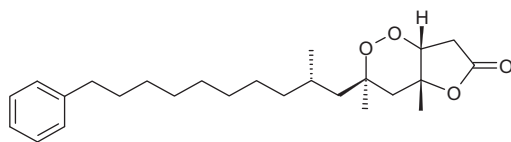
### 530 Plakortolide

**Type:** Bicycloheteroalicyclics (three O).  $C_{25}H_{34}O_4$  Light orange oil,  $[\alpha]_D = +5.6^\circ$  ( $c = 0.014$ ,  $CHCl_3$ ). **Source:** Sponges *Plakortis* sp. and *Plakinastrella onkodes*. **Pharm:** Cytotoxic; anti-toxoplasma effect (strong). **Ref:** B. S. Davidson, *Tet. Lett.*, 1991, 32, 1767 | T. L. Perry, et al, *Tetrahedron*, 2001, 57, 1483



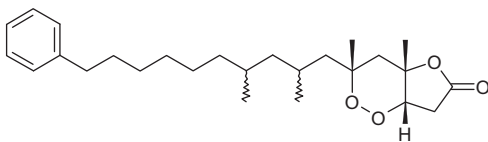
### 531 Plakortolide B

**Type:** Bicycloheteroalicyclics (three O).  $C_{25}H_{38}O_4$  Oil,  $[\alpha]_D = -4.7^\circ$  ( $c = 0.1$ ,  $CDCl_3$ ). **Source:** Sponge *Plakinastrella onkodes* (Gulf of Mexico). **Pharm:** Cytotoxic (A549,  $IC_{50} = 1.3 \mu\text{g/mL}$ ; P<sub>388</sub>,  $IC_{50} = 0.4 \mu\text{g/mL}$ ); cell adhesion inducer (EL-4,  $IC_{50} = 4.4 \mu\text{g/mL}$ ; IL-2, which correlates with signal transduction activity); PKC isoenzymesmodest agonist (50  $\mu\text{g/mL}$ :  $\alpha$ , +19%;  $\beta$ I, +13%;  $\beta$ II, +27%;  $\delta$ , +9%;  $\epsilon$ , +38%;  $\gamma$ , +9%). **Ref:** P. A. Horton, et al, *JNP*, 1994, 57, 1374 | T. L. Perry, et al, *Tetrahedron*, 2001, 57, 1483 | D. S. Dalisay, et al, *Angew. Chem., Int. Ed.*, 2009, 48, 4367

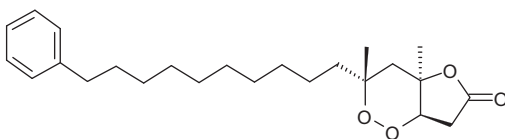


### 532 Plakortolide D

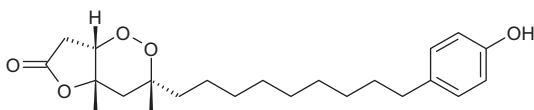
**Type:** Bicycloheteroalicyclics (three O).  $C_{26}H_{40}O_4$  Oil,  $[\alpha]_D = +61.1^\circ$  ( $c = 0.04$ ,  $CDCl_3$ ). **Source:** Sponge *Plakinastrella onkodes* (Gulf of Mexico). **Pharm:** Cytotoxic (A549,  $IC_{50} = 3.8 \mu\text{g/mL}$ ; P<sub>388</sub>,  $IC_{50} = 0.8 \mu\text{g/mL}$ ); inhibits cell adhesion (EL-4,  $IC_{50} = 15.8 \mu\text{g/mL}$ ). **Ref:** P. A. Horton, et al, *JNP*, 1994, 57, 1374

**533 Plakortolide E**

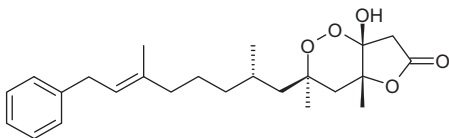
**Type:** Bicycloheteroalicyclics (three O).  $C_{24}H_{36}O_4$  Brown waxy solid,  $[\alpha]_D = +10.0^\circ$  ( $c = 0.09$ ,  $CH_2Cl_2$ ). **Source:** Sponge *Placortis* sp. (Fiji). **Pharm:** Cytotoxic (NCI 60-cell panel, selective melanoma and breast tumour cell lines). **Ref:** M. Varoglu, et al, JNP, 1995, 58, 27 | J. W. Blunt, et al, NPR, 2014, 31, 160 (rev)

**534 Plakortolide F**

**Type:** Bicycloheteroalicyclics (three O).  $C_{23}H_{34}O_5$  **Source:** Sponge *Plakinastrella* sp. (Seychelles). **Pharm:** Antifungal (yeast *Candida albicans*, MIC > 125  $\mu g/mL$  (SDB and RPMI media); *Aspergillus fumigatus*,  $IC_{90} > 125 \mu g/mL$ ). **Ref:** Y. Chen, et al, JNP, 2001, 64, 262

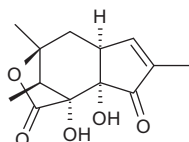
**535 Plakortolide F#**

**Type:** Bicycloheteroalicyclics (three O).  $C_{24}H_{34}O_5$  Oil,  $[\alpha]_D = -59.2^\circ$  ( $c = 0.025$ ,  $CHCl_3$ ). **Source:** Sponge *Plakinastrella onkodes*. **Pharm:** Antibacterial (gram-positive bacterium *Toxoplasma* sp.). **Ref:** T. L. Perry, et al, Tetrahedron, 2001, 57, 1483

**536 Acremostrictin**

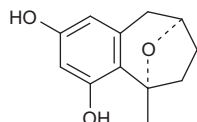
**Type:** Tricycloheteroalicyclics (one O).  $C_{13}H_{16}O_5$  **Source:** Marine-derived fungus *Acronium strictum* from an unidentified sponge (Gageo I., Korea waters). **Pharm:** Antioxidant (DPPH radical-scavenging assay and inhibited hydrogen peroxide-induced death of hmn keratinocyte HaCaT cells, moderate); antibacterial (*Micrococcus luteus*,

MIC = 50 µg/mL, *Salmonella typhimurium*, MIC = 50 µg/mL, *Proteus vulgaris*, MIC = 12.5 µg/mL). Ref: E. Julianti, et al, JNP, 2011, 74, 2592



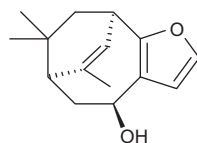
### 537 Bruguierol C

Type: Tricycloheteroalicyclics (one O).  $C_{12}H_{14}O_3$  Amorph. solid,  $[\alpha]_D^{20} = +4^\circ$  ( $c = 0.5$ , MeOH). Source: Mangrove *Bruguiera gymnorrhiza* (stem). Pharm: Antibacterial (*Staphylococcus aureus* SG 511, *Micrococcus luteus* ATCC 10240, *Enterococcus faecalis* 1528 vanA, *Escherichia coli* SG 458 and *Mycobacterium vaccae* MT 10670, MIC = 12.5 µg/mL). Ref: D. M. Solorio, et al, JOC, 2007, 72, 6621



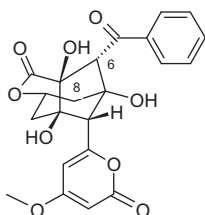
### 538 Dehydroeuryspongina A

Type: Tricycloheteroalicyclics (one O).  $C_{15}H_{18}O$  Pale yellow oil,  $[\alpha]_D^{20} = +55.9^\circ$  ( $c = 0.46$ ,  $CHCl_3$ ). Source: Sponge *Euryspongia* sp. (dehydrated product of Euryspongina A, formed in an NMR tube). Pharm: PTP1B inhibitor (an important target enzyme for the treatment of diabetes,  $IC_{50} = 3.6$  µmol/L, control Oleanolic acid,  $IC_{50} = 1.1$  µmol/L). Ref: H. Yamazaki, et al, Bioorg. Med. Chem. Lett., 2013, 23, 2151



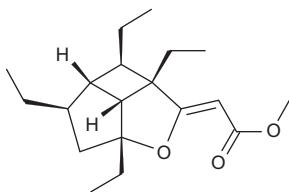
### 539 3-Epideoxyenterocin

Type: Tricycloheteroalicyclics (one O).  $C_{22}H_{20}O_9$   $[\alpha]_D = -22.9^\circ$  ( $c = 1.0$ , MeOH). Source: Marine-derived streptomycete *Streptomyces* sp. BD-26T(20) (shallow water sediment in Hawaii). Pharm: Antibacterial (inhibits growth of *Staphylococcus aureus*). Ref: N. Sitachitta, et al, Tetrahedron, 1996, 52, 8073



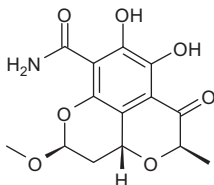
### 540 Hippolachnin A

**Type:** Tricycloheteroalicyclics (one O).  $C_{19}H_{30}O_3$  Colorless oil. **Source:** Sponge *Hippospongia lachne* (Xisha Is., South China waters Sea, China waters). **Pharm:** Antifungal (pathogenic fungi: *Cryptococcus neoformans*, MIC = 0.41  $\mu\text{mol/L}$ , control Voriconazole (VCZ), MIC = 0.18  $\mu\text{mol/L}$ ; *Trichophyton rubrum*, MIC = 0.41  $\mu\text{mol/L}$ , VCZ, MIC = 0.09  $\mu\text{mol/L}$ ; *Microsporium gypseum*, MIC = 0.41  $\mu\text{mol/L}$ , VCZ, MIC = 0.18  $\mu\text{mol/L}$ ; *Candida glabrata*, MIC = 1.63  $\mu\text{mol/L}$ , VCZ, MIC = 0.18  $\mu\text{mol/L}$ ; *Cryptococcus parapsilosis*, MIC = 1.63  $\mu\text{mol/L}$ , VCZ, MIC = 0.18  $\mu\text{mol/L}$ ; *Candida albicans*, MIC = 13.1  $\mu\text{mol/L}$ , VCZ, MIC = 0.18  $\mu\text{mol/L}$ ; *Aspergillus fumigatus*, MIC = 13.1  $\mu\text{mol/L}$ , VCZ, MIC = 5.73  $\mu\text{mol/L}$ ). **Ref:** S. -J. Piao, et al, Org. Lett., 2013, 15, 3526



### 541 JBIR 58

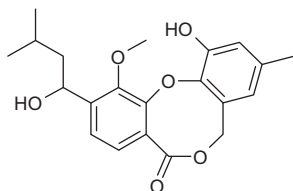
**Type:** Tricycloheteroalicyclics (two O).  $C_{14}H_{15}NO_7$  Yellow powder,  $[\alpha]_D^{24} = +72.3^\circ$  ( $c = 0.1$ ,  $\text{CHCl}_3$ ). **Source:** Marine-derived streptomycete *Streptomyces* sp. SpD081030ME-02 from an unidentified sponge (Ishigaki I., Okinawa). **Pharm:** Cytotoxic (WST-8 colorimetric assay, 48 h, HeLa,  $\text{IC}_{50} = 28 \mu\text{mol/L}$ ). **Ref:** J. Ueda, et al, J. Antibiot., 2010, 63, 267



### 542 Paeciloxcin A

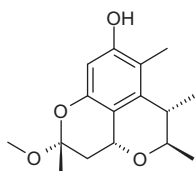
**Type:** Tricycloheteroalicyclics (two O).  $C_{21}H_{24}O_6$  **Source:** Mangrove-derived fungus *Paecilomyces* sp. from an unidentified mangrove (bark, Taiwan Strain). **Pharm:**

Cytotoxic (HepG2,  $IC_{50} = 1 \mu\text{g/mL}$ ); antifungal (*Curvularia lunata*, IZD = 12 mm; *Candida albicans*, IZD = 10 mm). Ref: L. Wen, et al, Russ. Chem. Bull., 2010, 59, 1656



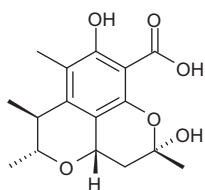
#### 543 Penicitrinol E

Type: Tricycloheteroalicyclics (two O).  $C_{16}H_{22}O_4$  Source: Marine-derived fungus *Penicillium citrinum* (sediment, Lanqi I., Fujian, China waters). Pharm: Cytotoxic (HL60, weak). Ref: L. Chen, et al, CPB, 2011, 59, 515



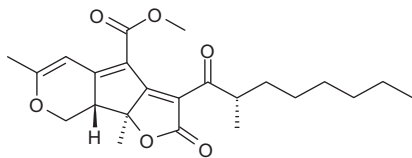
#### 544 Penicitrinol K

Type: Tricycloheteroalicyclics (two O).  $C_{16}H_{20}O_6$  Source: Marine-derived fungus *Penicillium* sp. ML226. Pharm: Antibacterial (20  $\mu\text{g/disk}$ , *Staphylococcus aureus* CMCC26003, IZ = 3 mm). Ref: M. L. Wang, et al, Molecules, 2013, 18, 5723

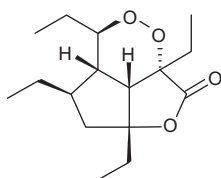


#### 545 Sequoiatone A

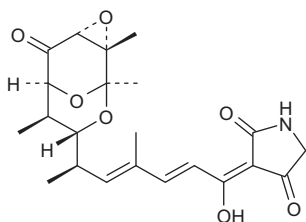
Type: Tricycloheteroalicyclics (two O).  $C_{23}H_{30}O_6$  Yellow cryst., mp 93.4–95.3 °C,  $[\alpha]_D^{25} = -750^\circ$  ( $c = 0.26$ , MeOH). Source: Mangrove-derived fungus *Penicillium* sp. JP-1 from mangrove *Aegiceras corniculatum* (China waters waters). Pharm: Cytotoxic (breast cancer cell lines,  $GI_{50} = 4\text{--}10 \mu\text{mol/L}$  with  $LC_{50} > 100 \mu\text{mol/L}$ ). Ref: Z. J. Lin, et al, Phytochemistry, 2008, 69, 1273

**546 Gracilioether H**

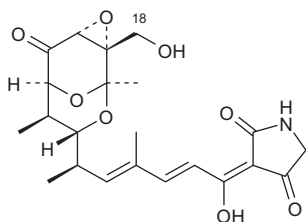
Type: Tricycloheteroalicyclics (three O).  $C_{16}H_{26}O_4$  Source: Sponge *Plakinastrella marmillaris* (Fiji). Pharm: Antiplasmodial (*Plasmodium falciparum*). Ref: C. Festa, et al, Tetrahedron, 2012, 68, 10157

**547 Tirandamycin A**

Type: Tricycloheteroalicyclics (three O).  $C_{22}H_{27}NO_7$  mp 98–102 °C,  $[\alpha]_D^{25} = +51^\circ$  (EtOH). Source: Marine-derived streptomycete *Streptomyces* sp. 307-9. Pharm: Antibacterial (gram-positive bacteria; RNA-polymerase inhibitor (potent));  $LD_{50}$  (mus, scu) = 370 mg/kg. Ref: D. J. Duchamp, et al, JACS, 1973, 95, 4077

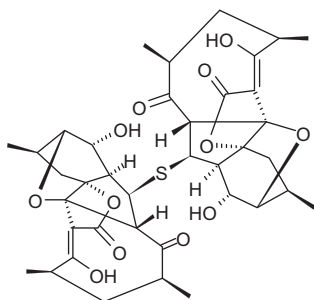
**548 Tirandamycin B**

Type: Tricycloheteroalicyclics (three O).  $C_{22}H_{27}NO_8$  Yellow powder, mp 92–96 °C. Source: Marine-derived streptomycete *Streptomyces* sp. 307-9. Pharm: Antibacterial (gram-positive bacteria); RNA polymerase inhibitor. Ref: H. Hagenmaier, et al, Arch. Microbiol., 1976, 109, 65



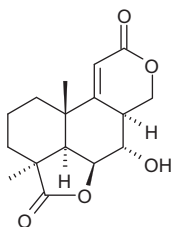
### 549 Abyssomicin J

**Type:** Polycycloheteroalicyclic Compounds.  $C_{38}H_{46}O_{12}S$  **Source:** Marine-derived bacterium *Verrucosipora* sp. (deep sea sediment, S. China waters Sea). **Pharm:** Prodrug of anti-TB antibiotic (upon oxidative activation, will be selectively transformed to *atrop*-abyssomicin C). **Ref:** Q. Wang, et al, *Angew. Chem., Int. Ed.*, 2013, 52, 1231



### 550 Botryosphaerin F

**Type:** Polycycloheteroalicyclic Compounds.  $C_{16}H_{20}O_5$  **Source:** Mangrove-derived fungus *Aspergillus terreus* (endophytic) from mangrove *Bruguiera gymnorrhiza* (branch, Guangxi, China waters). **Pharm:** Cytotoxic (HTCLs). **Ref:** C. Deng, et al, *Nat. Prod. Res.*, 2013, 27, 1882

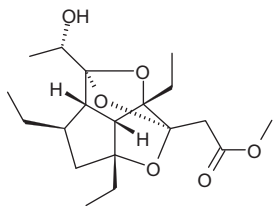


### 551 Gracilioether K

**Type:** Polycycloheteroalicyclic Compounds.  $C_{19}H_{30}O_6$  **Source:** Sponge *Plakinastrella mamillaris* (Fiji). **Pharm:** PXR (pregnane X receptor) agonist (docking studies)

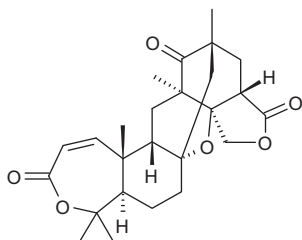


suggested a similar binding motif to other gracilioether congeners). Ref: C. Festa, et al, *Mar. Drugs*, 2013, 11, 2314



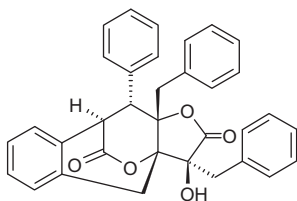
### 552 Insuetolide A

Type: Polycycloheteroalicyclic Compounds.  $C_{25}H_{32}O_6$  Glassy material,  $[\alpha]_D^{30} = -68^\circ$  ( $c = 0.35$ ,  $CHCl_3$ ). Source: Marine-derived fungus *Aspergillus insuetus* OY-207 from sponge *Psammocinia* sp. (Sdot-Yam, Israel). Pharm: Antifungal (*Neurospora crassa*, MIC = 140  $\mu$ mol/L). Ref: E. Cohen, et al, *BoMC*, 2011, 19, 6587



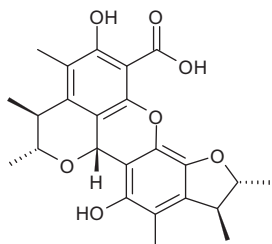
### 553 Ophiodilactone B

Type: Polycycloheteroalicyclic Compounds.  $C_{34}H_{28}O_5$  Yellow powder,  $[\alpha]_D^{20} = -222^\circ$  ( $c = 0.04$ , MeOH). Source: Ophiuroid *Ophiocoma scolopendrina* (inter-tidal). Pharm: Cytotoxic ( $P_{388}$ ,  $IC_{50} = 2.2 \mu$ g/mL). Ref: R. Ueoka, et al, *JOC*, 2009, 74, 4396



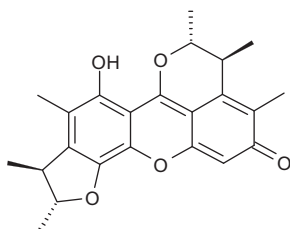
### 554 Penicitrinol J

Type: Polycycloheteroalicyclic Compounds.  $C_{24}H_{26}O_7$  Source: Marine-derived fungus *Penicillium* sp. ML226. Pharm: Antibacterial (20  $\mu$ g/disk, *Staphylococcus aureus* CMCC26003, IZ = 4 mm). Ref: M. L. Wang, et al, *Molecules*, 2013, 18, 5723



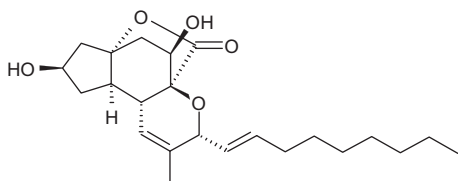
### 555 Penicitrinone A

**Type:** Polycycloheteroalicyclic Compounds.  $C_{23}H_{24}O_5$  Orange cryst. ( $C_6H_6$ /hexane), mp 150–152 °C,  $[\alpha]_D^{17} = +106.9^\circ$  ( $c = 0.36$ ,  $CHCl_3$ ). **Source:** Deep-sea fungus *Aspergillus* sp. SCSIOW3, fungi *Penicillium citrinum* IFM 53298 and *Penicillium notatum* B-52. **Pharm:** Anti- $A\beta$  peptide aggregation inhibition ( $A\beta_{42}$  assembling activity, 100  $\mu\text{mol/L}$ , 40.3%–72.3%). **Ref:** D. Wakana, et al, J. Nat. Med. (Tokyo), 2006, 60, 279 | H. Liu, et al, Chin. J. Mar. Drugs, 2014, 33, 71 (in Chinese)



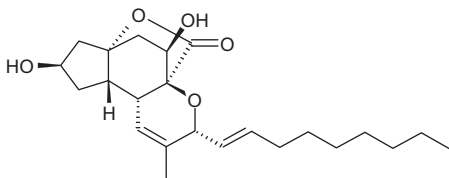
### 556 Penostatin G

**Type:** Polycycloheteroalicyclic Compounds.  $C_{23}H_{34}O_5$   $[\alpha]_D = -35.1^\circ$  ( $c = 0.29$ ,  $CHCl_3$ ). **Source:** Marine-derived fungus *Penicillium* sp. strain OUPS-79 from green alga *Enteromorpha intestinalis*. **Pharm:** Cytotoxic ( $P_{388}$ ,  $ED_{50} = 0.5 \mu\text{g/mL}$ ). **Ref:** C. Iwamoto, et al, JCS Perkin I, 1998, 449



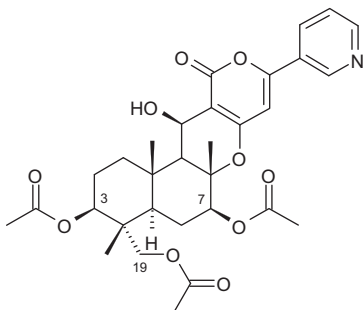
### 557 Penostatin H

**Type:** Polycycloheteroalicyclic Compounds.  $C_{23}H_{34}O_5$   $[\alpha]_D = -11.4^\circ$  ( $c = 0.18$ ,  $CHCl_3$ ). **Source:** Marine-derived fungus *Penicillium* sp. strain OUPS-79 from green alga *Enteromorpha intestinalis*. **Pharm:** Cytotoxic ( $P_{388}$ ,  $ED_{50} = 0.8 \mu\text{g/mL}$ ). **Ref:** C. Iwamoto, et al, JCS Perkin I, 1998, 449



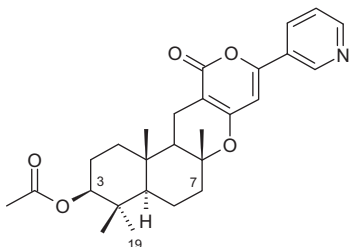
### 558 Pyripyropene A

**Type:** Polycycloheteroalicyclic Compounds.  $C_{31}H_{37}NO_{10}$  Powder,  $[\alpha]_D^{18} = +65.8^\circ$  ( $c = 1$ ,  $CHCl_3$ ). **Source:** Marine-derived fungi *Aspergillus sydowi* PFW1-13 from driftwood sample (China waters waters) and *Aspergillus* sp. GF-5. **Pharm:** Insecticide; MDR reversing activity. **Ref:** H. Tomoda, et al, JACS, 1994, 116, 12097 | M. Zhang, et al, JNP, 2008, 71, 985 | A. Hayashi, et al, Biol. Pharm. Bull., 2009, 32, 1261



### 559 Pyripyropene E

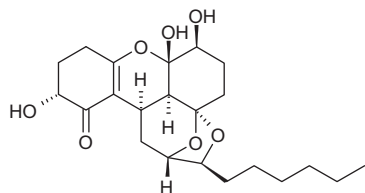
Antibiotic GERI-BP001 M **Type:** Polycycloheteroalicyclic Compounds.  $C_{27}H_{33}NO_5$  Cryst. (MeOH), mp 174–176 °C,  $[\alpha]_D^{18} = +146^\circ$  ( $c = 0.5$ ,  $CHCl_3$ ),  $[\alpha]_D^{28} = +113^\circ$  ( $c = 1$ , MeOH). **Source:** Marine-derived fungus *Aspergillus sydowi* PFW1-13 (from driftwood sample, China waters). **Pharm:** ACAT inhibitor. **Ref:** H. Tomoda, et al, J. Antibiot. 1995, 48, 495 | M. Zhang, et al, JNP, 2008, 71, 985



### 560 Trichodermatide A

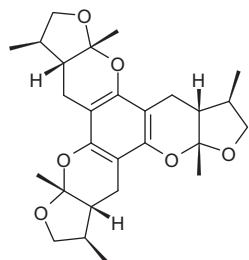
**Type:** Polycycloheteroalicyclic Compounds.  $C_{22}H_{32}O_7$  Oil,  $[\alpha]_D^{20} = -62.5^\circ$  ( $c = 0.04$ , MeOH). **Source:** Marine-derived fungus *Trichoderma reesei* (sediment sample, China

waters waters). Pharm: Cytotoxic (MTT assay, A375-S2,  $IC_{50} = 102.2 \mu\text{g/mL}$ ). Ref: Y. Sun, et al, Org. Lett., 2008, 10, 393



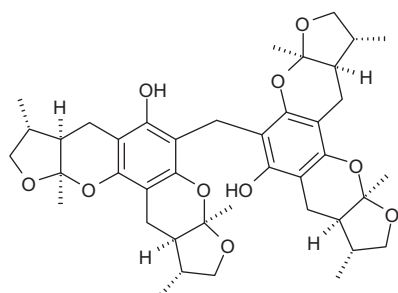
### 561 Xyloketal A

Type: Polycycloheteroalicyclic Compounds.  $C_{27}H_{36}O_6$  Cryst., mp 164–166 °C,  $[\alpha]_D^{25} = -4.9^\circ$  ( $c = 0.2$ ,  $\text{CHCl}_3$ ). Source: Mangrove-derived fungus *Xylaria* sp. 2508. Pharm: Acetylcholinesterase inhibitor. Ref: Y. C. Lin, et al, JOC, 2001, 66, 6252



### 562 Xyloketal F

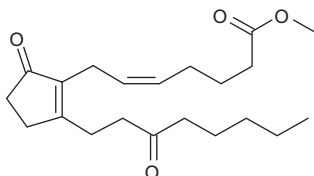
Type: Polycycloheteroalicyclic Compounds.  $C_{41}H_{52}O_{10}$  Needles (EtOAc/petrol), mp 160–162 °C,  $[\alpha]_D^{25} = -50.6^\circ$  ( $c = 0.2$ , MeOH). Source: Mangrove-derived fungus *Xylaria* sp. 2508. Pharm: L-Calcium channel blocker. Ref: X. -Y. Wu, et al, EurJOC, 2005, 4061



## 1.8 Prostaglandins (Prostanoids)

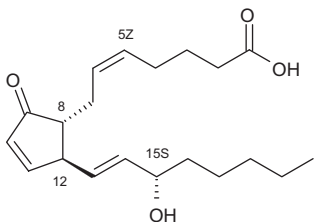
### 563 Methyl 9,15-dioxo-5,8(12)-prostadienoate

Type: Prostaglandins.  $C_{21}H_{32}O_4$  Pale yellow oil. Source: Soft coral *Sarcophyton crassocaule* (Indian Ocean). Pharm: High ocular hypotensive. Ref: A. S. R. Anjaneyulu, et al, JNP, 2000, 63, 1425



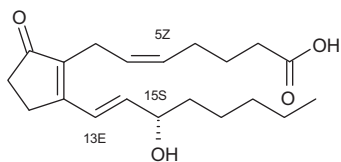
### 564 (5Z)-PGA<sub>2</sub>

(5Z)-Prostaglandin A<sub>2</sub> Type: Prostaglandins.  $C_{20}H_{30}O_4$  Oil,  $[\alpha]_D^{20} = +140^\circ$  ( $c = 1.15$ ,  $CHCl_3$ ). Source: Gorgonian *Plexaura homomalla*, and occurs in hmn both blood serum and seminal plasma. Pharm: LD<sub>50</sub> (mus, ipr) 93 mg/kg. Ref: A. J. Weinheimer, et al, Tet. Lett., 1969, 5185 | W. P. Schneider, et al, JACS, 1972, 94, 2122 | A. E. Greene, et al, JOC, 1978, 43, 4377 | A. D. Rodríguez, Tetrahedron, 1995, 51, 4571(rev) | S. M. Verbitski, et al, JMC, 2004, 47, 2062

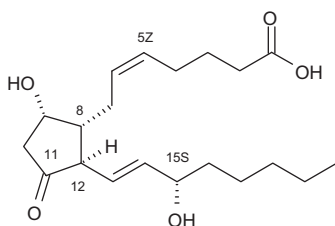


### 565 PGB<sub>2</sub>

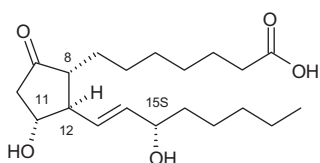
Prostaglandin B<sub>2</sub> Type: Prostaglandins.  $C_{20}H_{30}O_4$  Cryst.,  $[\alpha]_D^{25} = +16.3^\circ$  ( $c = 0.024$ ,  $CHCl_3$ ). Source: Soft coral *Sarcophyton crassocaule*, sea cucumber *Stichopus japonicus*, starfish *Distolasterias nipon*, ascidian *Halocynthia aurantium*, mussel *Mytilus edulis* (edible), mussel *Modiolus difficilis*, abalone *Haliotis ovina*, yellowtail fish *Seriola quinqueradiata* and *Crenomytilus grayanus*, and occurs in hmn seminal plasma (PGB<sub>2</sub> is the most abundant prostaglandin released from osteoblasts). Pharm: Inhibits uterine motility (*in vitro*). Ref: J. H. M. Feyen, et al, Prostaglandins, 1984, 28, 769 | O. D. Karotchenko, et al, Chem. Nat. Compd. (Engl. Transl.), 1999, 35, 612 | S. R. Ammanamanchi, et al, JNP, 2000, 63, 112

**566 PGD<sub>2</sub>**

Prostaglandin D<sub>2</sub> Type: Prostaglandins. C<sub>20</sub>H<sub>32</sub>O<sub>5</sub> Cryst., mp 68 °C. Source: Gorgonian *Plexaura homomalla*, soft coral *Gersemia fruticosa*, and occurs in hmn tissues. Pharm: Bronchoconstrictor; platelet aggregation inhibitor. Ref: B. J. R. Whittle, et al, *Adv. Exp. Med. Biol.*, 1985, 192, 109 (rev) | H. Giles, et al, *Prostaglandins*, 1988, 35, 277 | K. Varvas, et al, *Tet. Lett.*, 1993, 34, 3643

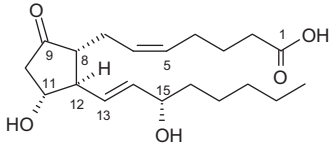
**567 PGE<sub>1</sub>**

Prostaglandin E<sub>1</sub> Type: Prostaglandins. C<sub>20</sub>H<sub>34</sub>O<sub>5</sub> Cryst. (EtOAc), mp 114–116.5 °C, [α]<sub>D</sub><sup>24</sup> = −53.2° (c = 0.977, THF). Source: Gorgonian *Plexaura homomalla*, and occurs in hmn both blood serum and seminal plasma. Pharm: Vasodilator and platelet aggregation inhibitor; LD<sub>50</sub> (rat, orl) = 228 mg/kg. Ref: J. Mai, et al, *Prostaglandins*, 1980, 20, 187

**568 PGE<sub>2</sub>**

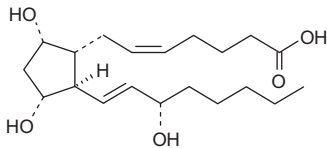
Prostaglandin E<sub>2</sub> Type: Prostaglandins. C<sub>20</sub>H<sub>32</sub>O<sub>5</sub> Cryst., mp 66–68 °C, [α]<sub>D</sub><sup>26</sup> = −61° (c = 1, THF). Source: Red algae *Gracilaria lichenoides* and *Gracilaria* spp., soft coral *Gersemia fruticosa*, mussel (horse mussel) *Modiolus demissus*, sea cucumber *Stichopus japonicus*, starfish *Distolasterias nipon*, ascidian *Halocynthia aurantium*, yellowtail fish *Seriola quinqueradiata*, occurs in mammalian tissues. Pharm: Oxytocic; abortifacient and vasodilator; luteolytic; LD<sub>50</sub> (rat, orl) = 500 mg/kg. Ref:

R. P. Gregson, et al, Tet. Lett., 1979, 4505 | K. Varvas, et al, Tet. Lett., 1993, 34, 3643 | O. D. Karotchenko, et al, Chem. Nat. Compd. (Engl. Transl.), 1999, 35, 612



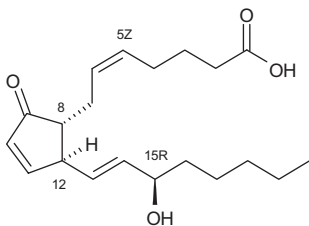
### 569 PGF<sub>2α</sub>

Prostaglandin F<sub>2α</sub> Type: Prostaglandins. C<sub>20</sub>H<sub>34</sub>O<sub>5</sub> Oil or solid, mp 25–35 °C, [α]<sub>D</sub><sup>25</sup> = +23.5° (c = 1, THF). Source: Red alga *Glacilaria lichenoides*, variety of marine algae and invertebrates, common naturally occurring mammalian prostaglandin. Pharm: Abortifacient; oxytocic; smooth muscle stimulant; LD<sub>50</sub> (rat, orl) = 1170 mg/kg. Ref: R. P. Gregson, et al, Tet. Lett., 1979, 4505 | O. D. Karotchenko, et al, Chem. Nat. Compd. (Engl. Transl.), 1999, 35, 612



### 570 15-*epi*-Prostaglandin A<sub>2</sub>

(5*Z*,8*R*,12*S*,13*E*,15*R*)-15-Hydroxy-9-oxo-5,10,13-prostatrien-1-oic acid Type: Prostaglandins. C<sub>20</sub>H<sub>30</sub>O<sub>4</sub> Source: Gorgonian *Plexaura homomalla* (content = 0.2%dw). Pharm: Anti-inflammatory. Ref: A. J. Weinheimer, et al, Tet. Lett., 1969, 5185

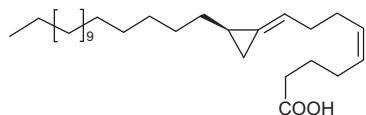


## 1.9 Oxylipins (Excluding Eicosanoids)

### 571 Amphimic acid A

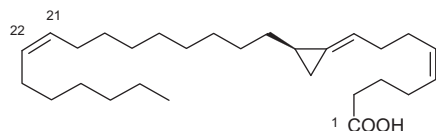
Type: Cyclopropyl-oxylipins. C<sub>28</sub>H<sub>50</sub>O<sub>2</sub> Needles (MeCN/Et<sub>2</sub>O), mp 39–39.5 °C, [α]<sub>D</sub><sup>22</sup> = +7.7° (c = 0.49, MeOH). Source: Sponge *Amphimedon* sp. (Australia). Pharm: Cytotoxic (P<sub>388</sub>, IC<sub>50</sub> = 1.8 μmol/L); Hmn DNA topoisomerase I inhibitor.

Ref: T. Nemoto, et al, Tet. Lett., 1997, 38, 5667 | T. Nemoto, et al, Tetrahedron, 1997, 53, 16699



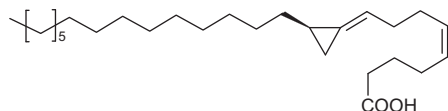
### 572 Amphimic acid B

**Type:** Cyclopropyl-oxylipins.  $C_{28}H_{48}O_2$  Oil,  $[\alpha]_D^{27} = +6.2^\circ$  ( $c = 0.98$ , MeOH). **Source:** Sponge *Amphimedon* sp. (Australia). **Pharm:** Hmn DNA topoisomerase I inhibitor. **Ref:** T. Nemoto, et al, Tet. Lett., 1997, 38, 5667 | T. Nemoto, et al, Tetrahedron, 1997, 53, 16699



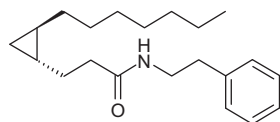
### 573 Amphimic acid C

**Type:** Cyclopropyl-oxylipins.  $C_{27}H_{48}O_2$  Oil,  $[\alpha]_D^{27} = +6.3^\circ$  ( $c = 0.11$ , MeOH). **Source:** Sponge *Amphimedon* sp. (Australia). **Pharm:** Hmn DNA topoisomerase I inhibitor. **Ref:** T. Nemoto, et al, Tet. Lett., 1997, 38, 5667 | T. Nemoto, et al, Tetrahedron, 1997, 53, 16699



### 574 Grenadamide A

**Grenadamide Type:** Cyclopropyl-oxylipins.  $C_{21}H_{33}NO$   $[\alpha]_D = -11^\circ$  ( $c = 0.1$ ,  $CHCl_3$ ). **Source:** Cyanobacterium *Lyngbya majuscula* (macroscopic, Grenada). **Pharm:** Toxic (brine shrimp,  $LD_{50} = 5 \mu g/mL$ ), binds to cannabinoid receptor ( $K_i = 4.7 \mu mol/L$ , modest). **Ref:** N. Sitachitta, et al, JNP, 1998, 61, 681

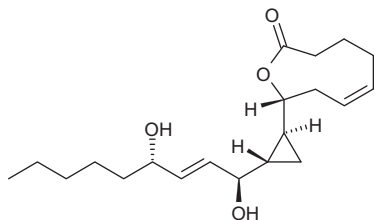


### 575 (-)-Halicholactone

**Type:** Cyclopropyl-oxylipins.  $C_{20}H_{32}O_4$  Oil,  $[\alpha]_D^{23} = -85.4^\circ$ . **Source:** Sponge *Halichondria okadae*. **Pharm:** 5-Lipoxygenase inhibitor (gpg, polymorphonuclear

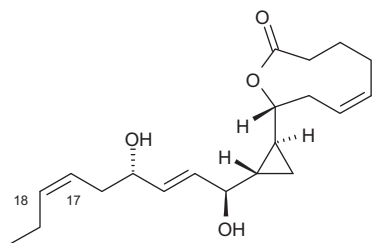


leukocytes,  $IC_{50} = 630 \mu\text{mol/L}$ ). Ref: H. Niwa, et al, Tet. Lett., 1989, 30, 4543 | H. Kigoshi, et al, Tet. Lett., 1991, 32, 2427 | P. J. Proteau, et al, JNP, 1994, 57, 1717 | Y. Baba, et al, JOC, 2001, 66, 81



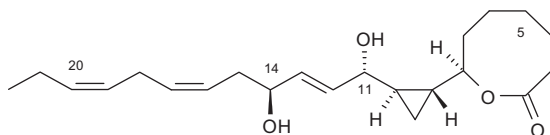
### 576 Neohalicholactone

Type: Cyclopropyl-oxylipins.  $C_{20}H_{30}O_4$  Cryst. ( $Et_2O$ /pentane), mp 69–70 °C,  $[\alpha]_D^{16} = -54.2^\circ$  ( $c = 0.73$ ,  $CHCl_3$ ). Source: Brown alga *Laminaria sinclairii* from sponge *Halichondria okadai*. Pharm: Lipoxygenase activity (weak). Ref: H. Niwa, K. Et al, Tet. Lett., 1989, 30, 4543 | H. Kigoshi, et al, Tet. Lett., 1991, 32, 2427 | P. J. Proteau, et al, JNP, 1994, 57, 1717 | D. J. Critcher, et al, Tet. Lett., 1995, 36, 3763 | M. Bishop, et al, Synthesis, 2010, 527



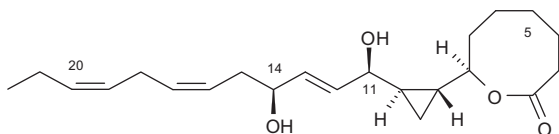
### 577 Solandelactone C

Type: Cyclopropyl-oxylipins.  $C_{22}H_{34}O_4$  Oil,  $[\alpha]_D^{25} = +2.9^\circ$  ( $c = 0.2$ , MeOH). Source: Hydroid *Solanderia secunda* (order Anthoathecata). Pharm: FPT inhibitor (100  $\mu\text{g/mL}$ , InRt = 69%, FPT is associated with cell differentiation and proliferation and its inhibition may be a target for novel anticancer agents). Ref: Y. W. Seo, et al, Tetrahedron 1996, 52, 10583

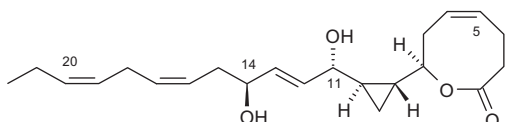


**578 Solandelactone D**

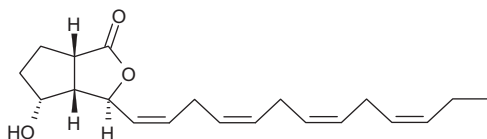
**Type:** Cyclopropyl-oxylipins.  $C_{22}H_{34}O_4$  Oil,  $[\alpha]_D^{25} = +5.7^\circ$  ( $c = 0.2$ , MeOH). **Source:** Hydroid *Solanderia secunda* (order Anthoathecata). **Pharm:** FPT inhibitor (100  $\mu\text{g}/\text{mL}$ , InRt = 89%). **Ref:** Y. W. Seo, et al, Tetrahedron 1996, 52, 10583

**579 Solandelactone G**

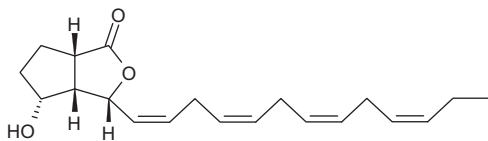
**Type:** Cyclopropyl-oxylipins.  $C_{22}H_{32}O_4$  Oil,  $[\alpha]_D^{25} = +3.7^\circ$  ( $c = 0.8$ , MeOH). **Source:** Hydroid *Solanderia secunda* (order Anthoathecata). **Pharm:** FPT inhibitor (100  $\mu\text{g}/\text{mL}$ , InRt = 61%). **Ref:** Y. W. Seo, et al, Tetrahedron 1996, 52, 10583

**580 Bacillariolide I**

**Type:** Cyclopentyl-oxylipins.  $C_{20}H_{28}O_3$  Colorless oil,  $[\alpha]_D = -23.6^\circ$  ( $c = 0.55$ , MeOH);  $[\alpha]_D^{24} = -25.9^\circ$  ( $c = 0.21$ , MeOH). **Source:** Diatoms *Pseudonitzschia multiseriis* and *Nitzschia pungens* f. *multiseriis*. **Pharm:** PLA<sub>2</sub> inhibitor (significant); toxic (causes amnesic shellfish poisoning). **Ref:** Y. Shimizu, et al, Pure Appl. Chem., 1989, 61, 513 | R. Wang, et al, J. Chem. Soc., Chem. Commun., 1993, 397 | H. Miyaoka, et al, Tetrahedron, 2000, 56, 8083

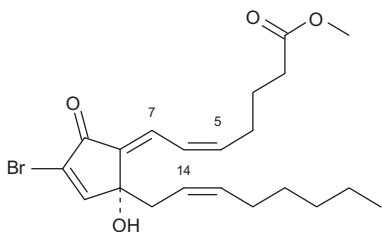
**581 Bacillariolide II**

**Type:** Cyclopentyl-oxylipins.  $C_{20}H_{28}O_3$  Colorless oil,  $[\alpha]_D = -58.5^\circ$  ( $c = 0.33$ , MeOH);  $[\alpha]_D^{23} = -59.2^\circ$  ( $c = 0.33$ , MeOH). **Source:** Diatoms *Pseudonitzschia multiseriis* and *Nitzschia pungens* f. *multiseriis*. **Pharm:** Toxin (causes amnesic shellfish poisoning). **Ref:** Y. Shimizu, et al, Pure Appl. Chem., 1989, 61, 513 | R. Wang, et al, J. Chem. Soc., Chem. Commun., 1993, 397 | H. Miyaoka, et al, Tetrahedron, 2000, 56, 8083



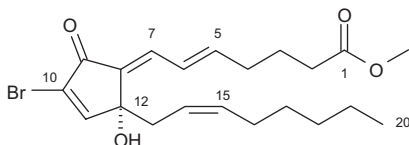
### 582 Bromovulone I

**Type:** Cyclopentyl-oxylinolins.  $C_{21}H_{29}BrO_4$  Oil. **Source:** Stolonifer *Clavularia viridis* (Japan waters waters). **Pharm:** Antineoplastic, antiproliferative. **Ref:** K. Iguchi, et al, Chem. Comm., 1986, 981



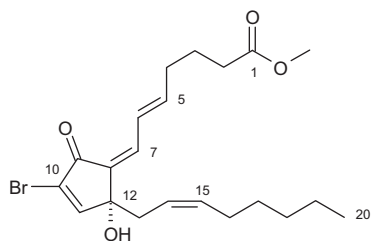
### 583 Bromovulone II

**Type:** Cyclopentyl-oxylinolins.  $C_{21}H_{29}BrO_4$  Pale yellow oil,  $[\alpha]_D^{25} = +23^\circ$  ( $c = 0.25$ ,  $CH_2Cl_2$ ). **Source:** Stolonifer *Clavularia viridis* (Taiwan waters). **Pharm:** Cytotoxic (PC3,  $IC_{50} = 5.6 \mu\text{mol/L}$ , control Chlorovulone II,  $IC_{50} = 0.8 \mu\text{mol/L}$ ; HT29,  $IC_{50} = 5.4 \mu\text{mol/L}$ , Chlorovulone III,  $IC_{50} = 2.7 \mu\text{mol/L}$ ). **Ref:** Y. -C. Shen, et al, JNP, 2004, 67, 542



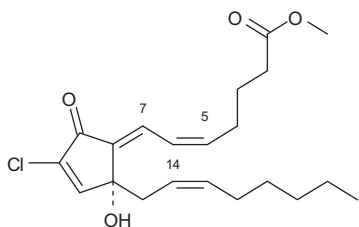
### 584 Bromovulone III

**Type:** Cyclopentyl-oxylinolins.  $C_{21}H_{29}BrO_4$  Pale yellow oil,  $[\alpha]_D^{25} = +39^\circ$  ( $c = 0.38$ ,  $CH_2Cl_2$ ). **Source:** Stolonifer *Clavularia viridis* (Taiwan waters). **Pharm:** Cytotoxic (PC3,  $IC_{50} = 0.5 \mu\text{mol/L}$ , control Chlorovulone II,  $IC_{50} = 0.8 \mu\text{mol/L}$ ; HT29,  $IC_{50} = 0.5 \mu\text{mol/L}$ , Chlorovulone III,  $IC_{50} = 2.7 \mu\text{mol/L}$ , induced apoptotic signaling in a sequential manner). **Ref:** Y. -C. Shen, et al, JNP, 2004, 67, 542 | P. -C. Chiang, et al, J. Hepatol., 2005, 43, 679



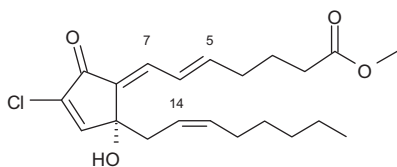
### 585 Chlorovulone I

**Type:** Cyclopentyl-oxylipins.  $C_{21}H_{29}ClO_4$  Oil,  $[\alpha]_D = -1.2^\circ$  ( $c = 0.17$ ,  $CHCl_3$ ). **Source:** *Stolonifer Clavularia viridis*. **Pharm:** Antineoplastic. **Ref:** K. Iguchi, et al, Tet. Lett., 1985, 26, 5787 | K. Iguchi, et al, Chem. Comm., 1986, 981



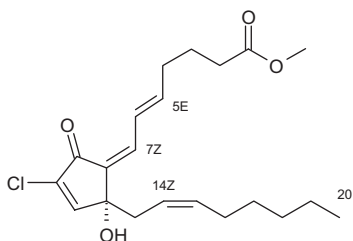
### 586 Chlorovulone II

**Type:** Cyclopentyl-oxylipins.  $C_{21}H_{29}ClO_4$   $[\alpha]_D = +22.7^\circ$  ( $c = 0.75$ ,  $CHCl_3$ ). **Source:** Stolonifers *Clavularia viridis* and *Clavularia viridis* (Taiwan waters). **Pharm:** Cytotoxic (HL60,  $IC_{50} = 30$  nmol/L; PC3,  $IC_{50} = 0.8$   $\mu$ mol/L). **Ref:** K. Iguchi, et al, Tet. Lett., 1985, 26, 5787 | K. Iguchi, et al, Chem. Comm., 1986, 981 | M. A. Ciufolini, et al, JOC, 1998, 63, 1668 | Y. -C. Shen, et al, JNP, 2004, 67, 542



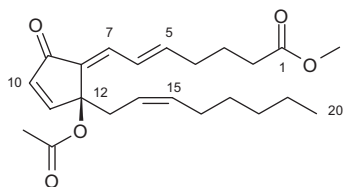
### 587 Chlorovulone III

**Type:** Cyclopentyl-oxylipins.  $C_{21}H_{29}ClO_4$   $[\alpha]_D = +27.3^\circ$  ( $c = 0.033$ ,  $CHCl_3$ ). **Source:** Stolonifers *Clavularia viridis* and *Clavularia viridis* (Taiwan waters). **Pharm:** Cytotoxic (PC3,  $IC_{50} = 1.9$   $\mu$ mol/L; HT29,  $IC_{50} = 2.7$   $\mu$ mol/L). **Ref:** K. Iguchi, et al, Tet. Lett., 1985, 26, 5787 | K. Iguchi, et al, Chem. Comm., 1986, 981 | Y. -C. Shen, et al, JNP, 2004, 67, 542



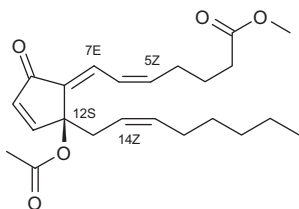
### 588 Claviridenone E

**Type:** Cyclopentyl-oxylipins.  $C_{23}H_{32}O_5$  Oil,  $[\alpha]_D^{25} = +8.6^\circ$  ( $c = 0.3$ ,  $CHCl_3$ ). **Source:** *Stolonifer Clavularia viridis* (Taiwan waters). **Pharm:** Cytotoxic (A549,  $ED_{50} = 0.41 \mu\text{g/mL}$ ; HT29,  $ED_{50} = 1.02 \mu\text{g/mL}$ ; P<sub>388</sub>,  $ED_{50} = 0.11 \mu\text{g/mL}$ ); cytotoxic (PC3,  $IC_{50} = 3.5 \mu\text{mol/L}$ , control Chlorovulone II,  $IC_{50} = 0.8 \mu\text{mol/L}$ ; HT29,  $IC_{50} > 10 \mu\text{mol/L}$ , control Chlorovulone II,  $IC_{50} = 2.7 \mu\text{mol/L}$ ). **Ref:** C. -Y. Duh, et al, JNP, 2002, 65, 1535 | Y. -C. Shen, et al, JNP, 2004, 67, 542



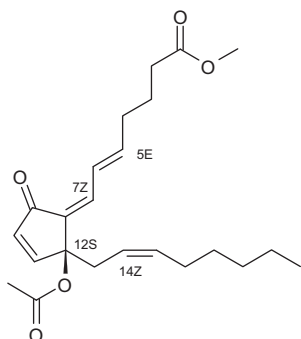
### 589 Claviridenone F

**Type:** Cyclopentyl-oxylipins.  $C_{23}H_{32}O_5$  Amorph. solid,  $[\alpha]_D^{25} = +6.7^\circ$  ( $c = 0.3$ ,  $CHCl_3$ ). **Source:** *Stolonifers Clavularia viridis* and *Clavularia violacea* **Pharm:** Cytotoxic (A549,  $ED_{50} = 0.0050 \mu\text{g/mL}$ ; HT29,  $ED_{50} = 0.051 \mu\text{g/mL}$ ; P<sub>388</sub>,  $ED_{50} = 0.52 \text{ pg/mL}$ ). **Ref:** C. -Y. Duh, et al, JNP, 2002, 65, 1535



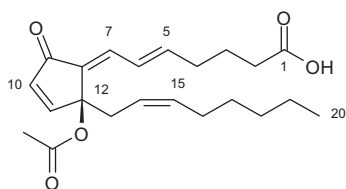
### 590 Claviridenone G

**Type:** Cyclopentyl-oxylipins.  $C_{23}H_{32}O_5$  Oil,  $[\alpha]_D^{25} = +5.4^\circ$  ( $c = 0.1$ ,  $CHCl_3$ ). **Source:** *Stolonifer Clavularia viridis*. **Pharm:** Cytotoxic (A549,  $ED_{50} = 0.051 \mu\text{g/mL}$ ; HT29,  $ED_{50} = 1.22 \mu\text{g/mL}$ ; P<sub>388</sub>,  $ED_{50} = 0.26 \mu\text{g/mL}$ ). **Ref:** C. -Y. Duh, et al, JNP, 2002, 65, 1535



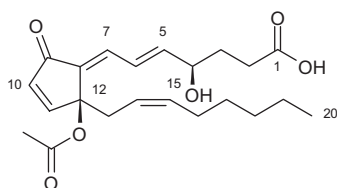
### 591 Claviridic acid A

**Type:** Cyclopentyl-oxylipins.  $C_{22}H_{30}O_5$  Oil,  $[\alpha]_D^{26} = -33.6^\circ$  ( $c = 0.1$ ,  $CH_2Cl_2$ ). **Source:** *Stolonifer Clavularia viridis*. **Pharm:** Inhibits PHA-induced proliferation of PBMC (drug 10  $\mu\text{g/mL}$ : PHA 0.2  $\mu\text{g/mL}$ , InRt = 80.4%, PHA 5  $\mu\text{g/mL}$ , InRt = 87.9%, an anti-inflammatory mechanism), cytotoxic (AGS,  $IC_{50} = (1.73 \pm 0.03)\mu\text{g/mL}$ , control Doxorubicin,  $IC_{50} = (0.1 \pm 0.01)\mu\text{g/mL}$ ). **Ref:** Y. -S. Lin, et al, Chem. Biodiversity, 2008, 5, 784



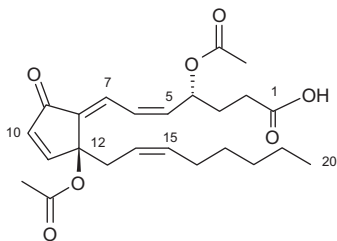
### 592 Claviridic acid B

**Type:** Cyclopentyl-oxylipins.  $C_{22}H_{30}O_6$  Oil,  $[\alpha]_D^{26} = +13.2^\circ$  ( $c = 0.1$ ,  $CH_2Cl_2$ ). **Source:** *Stolonifer Clavularia viridis*. **Pharm:** Inhibits PHA-induced proliferation of PBMC (drug 10  $\mu\text{g/mL}$ : PHA 0.2  $\mu\text{g/mL}$ , InRt = 65.9%, PHA 5  $\mu\text{g/mL}$ , InRt = 69.5%, an anti-inflammatory mechanism), cytotoxic (AGS,  $IC_{50} = (3.75 \pm 0.13)\mu\text{g/mL}$ , control Doxorubicin,  $IC_{50} = (0.1 \pm 0.01)\mu\text{g/mL}$ ). **Ref:** K. Watanabe, et al, JNP, 1996, 59, 980 | Y. -S. Lin, et al, Chem. Biodiversity, 2008, 5, 784

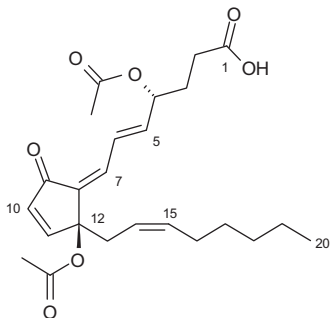


**593 Claviridic acid C**

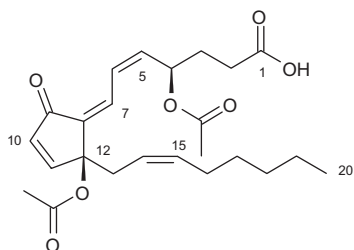
**Type:** Cyclopentyl-oxylipins.  $C_{24}H_{32}O_7$  Oil,  $[\alpha]_D^{26} = -36.8^\circ$  ( $c = 0.1$ ,  $CH_2Cl_2$ ). **Source:** *Stolonifer Clavularia viridis*. **Pharm:** Inhibits PHA-induced proliferation of PBMC (drug 10  $\mu\text{g}/\text{mL}$ : PHA 0.2  $\mu\text{g}/\text{mL}$ , InRt = 46.5%, PHA 5  $\mu\text{g}/\text{mL}$ , InRt = 61.6%, an anti-inflammatory mechanism), cytotoxic (AGS,  $IC_{50} = (7.78 \pm 0.43)\mu\text{g}/\text{mL}$ , control Doxorubicin,  $IC_{50} = (0.1 \pm 0.01)\mu\text{g}/\text{mL}$ ). **Ref:** Y. -S. Lin, et al, Chem. Biodiversity, 2008, 5, 784

**594 Claviridic acid D**

**Type:** Cyclopentyl-oxylipins.  $C_{24}H_{32}O_7$  Oil,  $[\alpha]_D^{26} = +13.2^\circ$  ( $c = 0.1$ ,  $CH_2Cl_2$ ). **Source:** *Stolonifer Clavularia viridis*. **Pharm:** Inhibits PHA-induced proliferation of PBMC (drug 10  $\mu\text{g}/\text{mL}$ : PHA 0.2  $\mu\text{g}/\text{mL}$ , InRt = 77.2%, PHA 5  $\mu\text{g}/\text{mL}$ , InRt = 79.8%, an anti-inflammatory mechanism), cytotoxic (AGS,  $IC_{50} = (3.14 \pm 0.16)\mu\text{g}/\text{mL}$ , control Doxorubicin,  $IC_{50} = (0.1 \pm 0.01)\mu\text{g}/\text{mL}$ ). **Ref:** Y. -S. Lin, et al, Chem. Biodiversity, 2008, 5, 784

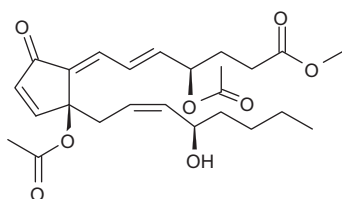
**595 Claviridic acid E**

**Type:** Cyclopentyl-oxylipins.  $C_{24}H_{32}O_7$  Oil,  $[\alpha]_D^{26} = -15.6^\circ$  ( $c = 0.1$ ,  $CH_2Cl_2$ ). **Source:** *Stolonifer Clavularia viridis*. **Pharm:** Inhibits PHA-induced proliferation of PBMC (drug 10  $\mu\text{g}/\text{mL}$ : PHA 0.2  $\mu\text{g}/\text{mL}$ , InRt = 76.9%, PHA 5  $\mu\text{g}/\text{mL}$ , InRt = 81.2%, an anti-inflammatory mechanism), cytotoxic (AGS,  $IC_{50} = (4.22 \pm 0.28)\mu\text{g}/\text{mL}$ , control Doxorubicin,  $IC_{50} = (0.1 \pm 0.01)\mu\text{g}/\text{mL}$ ). **Ref:** Y. -S. Lin, et al, Chem. Biodiversity, 2008, 5, 784



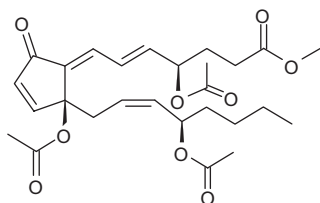
### 596 Claviridin A

**Type:** Cyclopentyl-oxylipins.  $C_{25}H_{34}O_8$  **Source:** Stolonifer *Clavularia viridis* (Kenting, South coast of Taiwan). **Pharm:** Cytotoxic (Hep2,  $ED_{50} = 0.19 \mu\text{g/mL}$ , control CPT,  $ED_{50} = 0.06 \mu\text{g/mL}$ ; Doay hmn medulloblastoma,  $ED_{50} = 0.18 \mu\text{g/mL}$ , CPT,  $ED_{50} = 0.15 \mu\text{g/mL}$ ; WiDr hmn colon adenocarcinoma,  $ED_{50} = 0.34 \mu\text{g/mL}$ , CPT,  $ED_{50} = 0.05 \mu\text{g/mL}$ ; Hela hmn cervical epitheloid carcinoma,  $ED_{50} = 0.59 \mu\text{g/mL}$ , CPT,  $ED_{50} = 0.19 \mu\text{g/mL}$ ). **Ref:** Y. -C. Shen, et al, Chem. Biodiversity, 2010, 7, 2702



### 597 Claviridin B

**Type:** Cyclopentyl-oxylipins.  $C_{27}H_{36}O_9$  **Source:** Stolonifer *Clavularia viridis* (Kenting, South coast of Taiwan). **Pharm:** Cytotoxic (Hep2,  $ED_{50} = 0.16 \mu\text{g/mL}$ , control CPT,  $ED_{50} = 0.06 \mu\text{g/mL}$ ; Doay,  $ED_{50} = 0.25 \mu\text{g/mL}$ , CPT,  $ED_{50} = 0.15 \mu\text{g/mL}$ ; WiDr,  $ED_{50} = 0.31 \mu\text{g/mL}$ , CPT,  $ED_{50} = 0.05 \mu\text{g/mL}$ ; Hela,  $ED_{50} = 0.88 \mu\text{g/mL}$ , CPT,  $ED_{50} = 0.19 \mu\text{g/mL}$ ). **Ref:** Y. -C. Shen, et al, Chem. Biodiversity, 2010, 7, 2702

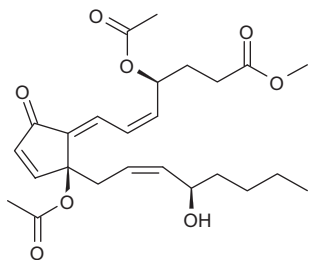


### 598 Claviridin C

**Type:** Cyclopentyl-oxylipins.  $C_{25}H_{34}O_8$  **Source:** Stolonifer *Clavularia viridis* (Kenting, South coast of Taiwan). **Pharm:** Cytotoxic (Hep2,  $ED_{50} = 0.35 \mu\text{g/mL}$ , control CPT,  $ED_{50} = 0.06 \mu\text{g/mL}$ ; Doay,  $ED_{50} = 0.29 \mu\text{g/mL}$ , CPT,  $ED_{50} = 0.15 \mu\text{g/mL}$ ; WiDr,

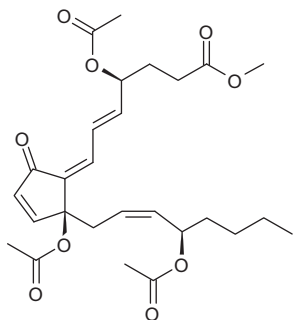


ED<sub>50</sub> = 0.25 µg/mL, CPT, ED<sub>50</sub> = 0.05 µg/mL; Hela, ED<sub>50</sub> = 0.31 µg/mL, CPT, ED<sub>50</sub> = 0.19 µg/mL). Ref: Y. -C. Shen, et al, Chem. Biodiversity, 2010, 7, 2702



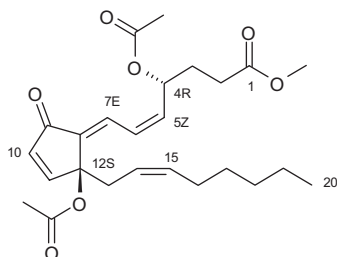
### 599 Claviridin D

Type: Cyclopentyl-oxylipins. C<sub>27</sub>H<sub>36</sub>O<sub>9</sub> Source: Stolonifer *Clavularia viridis* (Kenting, South coast of Taiwan). Pharm: Cytotoxic (Hep2, ED<sub>50</sub> = 0.25 µg/mL, control CPT, ED<sub>50</sub> = 0.06 µg/mL; Doay, ED<sub>50</sub> = 0.23 µg/mL, CPT, ED<sub>50</sub> = 0.15 µg/mL; WiDr, ED<sub>50</sub> = 0.22 µg/mL, CPT, ED<sub>50</sub> = 0.05 µg/mL; Hela, ED<sub>50</sub> = 0.45 µg/mL, CPT, ED<sub>50</sub> = 0.19 µg/mL). Ref: Y. -C. Shen, et al, Chem. Biodiversity, 2010, 7, 2702



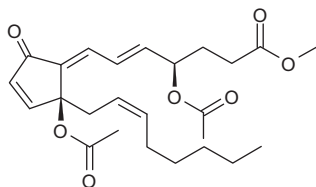
### 600 Clavulone I

Claviridenone D Type: Cyclopentyl-oxylipins. C<sub>25</sub>H<sub>34</sub>O<sub>7</sub> Yellowish oil, [α]<sub>D</sub> = -28.9° (CHCl<sub>3</sub>). Source: Stolonifer *Clavularia viridis*. Pharm: Inhibits PHA-induced proliferation of PBMC (drug 10 µg/mL: PHA 0.2 µg/mL, InRt = 79.6%, PHA 5 µg/mL, InRt = 85.2%, an anti-inflammatory mechanism), cytotoxic (AGS, IC<sub>50</sub> = (1.14 ± 0.02) µg/mL, control Doxorubicin, IC<sub>50</sub> = (0.1 ± 0.01) µg/mL). Ref: H. Kikuchi, et al, Tet. Lett., 1982, 23, 5171 | M. Kobayashi, et al, Tet. Lett., 1982, 23, 5331 | M. Kobayashi, et al, CPB, 1983, 31, 1440 | I. Kitagawa, et al, Tetrahedron, 1985, 41, 995 | Y. -S. Lin, et al, Chem. Biodiversity, 2008, 5, 784



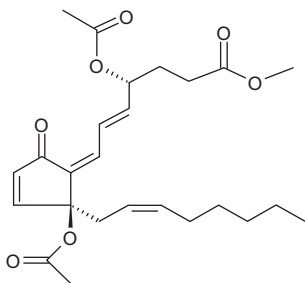
### 601 Clavulone II

Claviridenone C **Type:** Cyclopentyl-oxylipins.  $C_{25}H_{34}O_7$  Yellowish oil,  $[\alpha]_D = +10.9^\circ$  ( $CHCl_3$ ). **Source:** Stolonifer *Clavularia viridis*. **Pharm:** Inhibits PHA-induced proliferation of PBMC (drug 10  $\mu\text{g}/\text{mL}$ : PHA 0.2  $\mu\text{g}/\text{mL}$ , InRt = 74.4%, PHA 5  $\mu\text{g}/\text{mL}$ , InRt = 81.6%, an anti-inflammatory mechanism), cytotoxic (AGS,  $IC_{50} = (0.98 \pm 0.19)$   $\mu\text{g}/\text{mL}$ , control Doxorubicin,  $IC_{50} = (0.1 \pm 0.01)\mu\text{g}/\text{mL}$ ). **Ref:** H. Kikuchi, et al, Tet. Lett., 1982, 23, 5171 | M. Kobayashi, et al, Tet. Lett., 1982, 23, 5331 | M. Kobayashi, et al, CPB, 1983, 31, 1440 | H. Nagaoka, et al, Tet. Lett., 1984, 25, 3621 | I. Kitagawa, et al, Tetrahedron, 1985, 41,995 | Y. -S. Lin, et al, Chem. Biodiversity, 2008, 5, 784



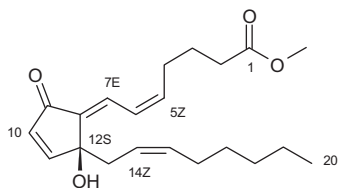
### 602 Clavulone III

Claviridenone B **Type:** Cyclopentyl-oxylipins.  $C_{25}H_{34}O_7$  Yellowish oil,  $[\alpha]_D = +45.5^\circ$  ( $CHCl_3$ ). **Source:** Stolonifer *Clavularia viridis*. **Pharm:** Inhibits PHA-induced proliferation of PBMC (drug 10  $\mu\text{g}/\text{mL}$ : PHA 0.2  $\mu\text{g}/\text{mL}$ , InRt = 75.8%, PHA 5  $\mu\text{g}/\text{mL}$ , InRt = 79.8%, an anti-inflammatory mechanism), cytotoxic (AGS,  $IC_{50} = (3.12 \pm 0.15)$   $\mu\text{g}/\text{mL}$ , control Doxorubicin,  $IC_{50} = (0.1 \pm 0.01)\mu\text{g}/\text{mL}$ ). **Ref:** H. Kikuchi, et al, Tet. Lett., 1982, 23, 5171 | M. Kobayashi, et al, Tet. Lett., 1982, 23, 5331 | M. Kobayashi, et al, CPB, 1983, 31, 1440 | I. Kitagawa, et al, Tetrahedron, 1985, 41,995 | Y. -S. Lin, et al, Chem. Biodiversity, 2008, 5, 784



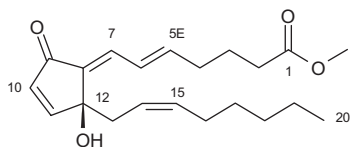
#### 603 4-Deacetoxy-12-O-deacetylclavulone I

Methyl (5Z,7E,12S,14Z)-12-Hydroxy-9-oxo-5,7,10,14-prostatetraenoate Type: Cyclopentyl-oxylipins.  $C_{21}H_{30}O_4$  Pale yellow oil,  $[\alpha]_D^{25} = +24^\circ$  ( $c = 0.4$ ,  $CH_2Cl_2$ ). Source: Stonifer *Clavularia viridis* (Taiwan waters). Pharm: Cytotoxic (PC3,  $IC_{50} = 7.2 \mu\text{mol/L}$ , control Chlorovulone II,  $IC_{50} = 0.8 \mu\text{mol/L}$ ; HT29,  $IC_{50} = 6.0 \mu\text{mol/L}$ , Chlorovulone III,  $IC_{50} = 2.7 \mu\text{mol/L}$ ). Ref: Y. -C. Shen, et al, JNP, 2004, 67, 542



#### 604 4-Deacetoxy-12-O-deacetylclavulone II

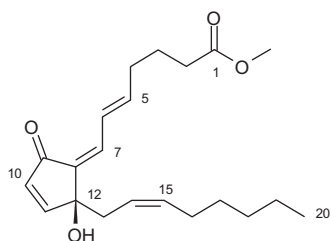
Methyl (5E,7E,12S,14Z)-12-Hydroxy-9-oxo-5,7,10,14-prostatetraenoate Type: Cyclopentyl-oxylipins.  $C_{21}H_{30}O_4$  Pale yellow oil,  $[\alpha]_D^{25} = +54^\circ$  ( $c = 0.8$ ,  $CH_2Cl_2$ ). Source: Stonifer *Clavularia viridis* (Taiwan waters). Pharm: Cytotoxic (PC3,  $IC_{50} = 5.4 \mu\text{mol/L}$ , control Chlorovulone II,  $IC_{50} = 0.8 \mu\text{mol/L}$ ; HT29,  $IC_{50} = 4.1 \mu\text{mol/L}$ , Chlorovulone III,  $IC_{50} = 2.7 \mu\text{mol/L}$ ). Ref: Y. -C. Shen, et al, JNP, 2004, 67, 542



#### 605 4-Deacetoxy-12-O-deacetylclavulone III

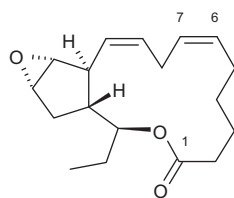
Methyl (5E,7Z,12S,14Z)-12-Hydroxy-9-oxo-5,7,10,14-prostatetraenoate Type: Cyclopentyl-oxylipins.  $C_{21}H_{30}O_4$  Pale yellow oil,  $[\alpha]_D^{25} = +15^\circ$  ( $c = 0.8$ ,  $CH_2Cl_2$ ). Source: Stonifer *Clavularia viridis* (Taiwan waters). Pharm: Cytotoxic (PC3,  $IC_{50} = 3.9 \mu\text{mol/L}$ , control

Chlorovulone II,  $IC_{50} = 0.8 \mu\text{mol/L}$ ; HT29,  $IC_{50} = 7.9 \mu\text{mol/L}$ , Chlorovulone III,  $IC_{50} = 2.7 \mu\text{mol/L}$ . Ref: Y. -C. Shen, et al, JNP, 2004, 67, 542



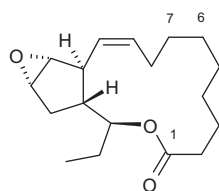
### 606 Ecklonialactone A

Type: Cyclopentyl-oxylipins.  $C_{18}H_{26}O_3$  Cryst. (EtOH), mp 96–98 °C,  $[\alpha]_D = -87.7^\circ$  ( $c = 1.02$ ,  $CHCl_3$ ). Source: Brown alga *Ecklonia stolonifera*. Pharm: Antifeedant. Ref: K. Kurata, et al, Chem. Lett., 1989, 267 | J. S. Todd, et al, JNP, 1994, 57, 171



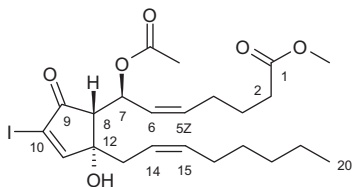
### 607 Ecklonialactone B

Type: Cyclopentyl-oxylipins.  $C_{18}H_{28}O_3$  Cryst. (EtOH), mp 64–66 °C,  $[\alpha]_D = -49.3^\circ$  ( $c = 1.08$ ,  $CHCl_3$ ). Source: Brown alga *Ecklonia stolonifera*. Pharm: Antifeedant. Ref: K. Kurata, et al, Chem. Lett., 1989, 267 | J. S. Todd, et al, JNP, 1994, 57, 171

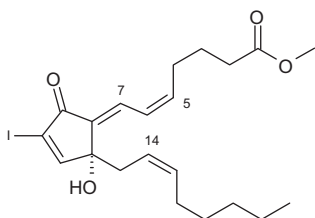


### 608 (5Z)-Iodopunaglandin 8

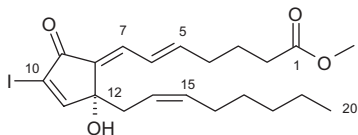
Type: Cyclopentyl-oxylipins.  $C_{23}H_{33}IO_6$  Oil,  $[\alpha]_D = +22.7^\circ$  ( $c = 0.67$ ,  $CHCl_3$ ). Source: Stolonifer *Clavularia viridis* (Okinawa). Pharm: Cytotoxic (Molt4,  $IC_{50} = 0.52 \mu\text{g/mL}$ ; DLD-1,  $IC_{50} = 0.6 \mu\text{g/mL}$ ; IMR-90,  $IC_{50} = 4.5 \mu\text{g/mL}$ ). Ref: H. Yamaue, et al, Eur. J. Cancer 1991, 27, 1258 | K. Watanabe, et al, JNP, 2001, 64, 1421 | Y. -C. Shen, et al, JNP, 2004, 67, 542

**609 Iodovulone I**

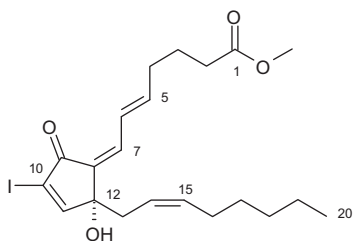
**Type:** Cyclopentyl-oxylipins.  $C_{21}H_{29}IO_4$  Oil. **Source:** *Stolonifer Clavularia viridis*. **Pharm:** Antineoplastic, antiproliferative. **Ref:** K. Iguchi, et al, Chem. Comm., 1986, 981

**610 Iodovulone II**

**Type:** Cyclopentyl-oxylipins.  $C_{21}H_{29}IO_4$  Oil,  $[\alpha]_D^{25} = +44.6^\circ$  ( $c = 0.9$ ,  $CH_2Cl_2$ ),  $[\alpha]_D^{25} = +23.7^\circ$  ( $c = 0.07$ ,  $CHCl_3$ ). **Source:** *Stolonifer Clavularia viridis* (Taiwan waters). **Pharm:** Cytotoxic (PC3,  $IC_{50} = 3.9 \mu\text{mol/L}$ , control Chlorovulone II,  $IC_{50} = 0.8 \mu\text{mol/L}$ ; HT29,  $IC_{50} = 6.5 \mu\text{mol/L}$ , Chlorovulone III,  $IC_{50} = 2.7 \mu\text{mol/L}$ ). **Ref:** Y. -C. Shen, et al, JNP, 2004, 67, 542

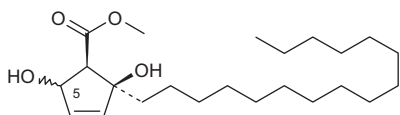
**611 Iodovulone III**

**Type:** Cyclopentyl-oxylipins.  $C_{21}H_{29}IO_4$  Oil,  $[\alpha]_D^{25} = +25^\circ$  ( $c = 0.02$ ,  $CHCl_3$ ),  $[\alpha]_D^{25} = +8.6^\circ$  ( $c = 0.27$ ,  $CH_2Cl_2$ ). **Source:** *Stolonifer Clavularia viridis* (Taiwan waters). **Pharm:** Cytotoxic (PC3,  $IC_{50} = 6.7 \mu\text{mol/L}$ , control Chlorovulone II,  $IC_{50} = 0.8 \mu\text{mol/L}$ ; HT29,  $IC_{50} > 10 \mu\text{mol/L}$ , Chlorovulone III,  $IC_{50} = 2.7 \mu\text{mol/L}$ ). **Ref:** Y. -C. Shen, et al, JNP, 2004, 67, 542



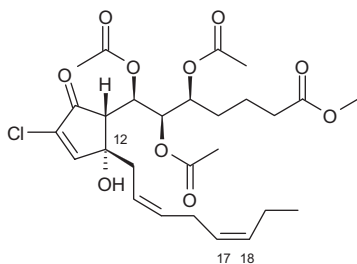
### 612 Plakevulin A

**Type:** Cyclopentyl-oxylipins.  $C_{23}H_{42}O_4$   $[\alpha]_D^{22} = -25^\circ$  ( $c = 0.1$ ,  $CHCl_3$ ). **Source:** Sponge *Plakortis* sp. **Pharm:** DNA polymerases inhibitor. **Ref:** M. Saito, et al, Tet. Lett., 2004, 45, 8069



### 613 Punaglandin 1

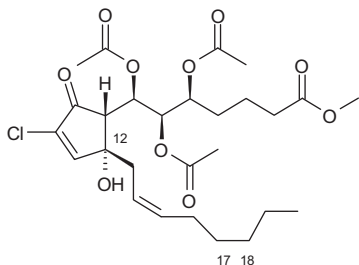
Methyl 5,6,7-tris(acetyloxy)-10-chloro-12-hydroxy-9-oxoprostano-10,14,17-trien-1-oate  
**Type:** Cyclopentyl-oxylipins.  $C_{27}H_{37}ClO_{10}$   $[\alpha]_D = +10.6^\circ$  ( $c = 2.4$ , MeOH). **Source:** Octacoral *Telesto riisei* (Japan waters waters), stolonifer *Carijoa* sp. (Indo-Pacific). **Pharm:** Cytotoxic ( $L_{1210}$ , cell proliferation inhibitor); anti-inflammatory. **Ref:** B. J. Baker, et al, JACS, 1985, 107, 2976 | H. Sasai, et al, Tet. Lett., 1987, 28, 333 | B. J. Baker, et al, JNP, 1994, 57, 1346 | M. L. Ciavatta, et al, Tet. Lett., 2004, 45, 7745



### 614 Punaglandin 2

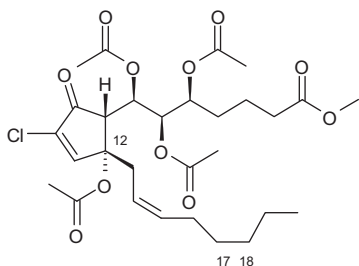
**Type:** Cyclopentyl-oxylipins.  $C_{27}H_{39}ClO_{10}$   $[\alpha]_D = +8.8^\circ$  ( $c = 1.9$ , MeOH). **Source:** Octacoral *Telesto riisei* (Hawaii). **Pharm:** Cytotoxic (HCT116,  $EC_{50} = (0.040-0.047)$   $\mu\text{mol/L}$ ) (4 assaies: with/without p53, with/without p21, ability to cause apoptosis)

is p53-independent); anti-inflammatory. Ref: B. J. Baker, et al, JACS, 1985, 107, 2976 | H. Sasai, et al, Tet. Lett., 1987, 28, 333 | B. J. Baker, et al, JNP, 1994, 57, 1346 | S. M. Verbitski, et al, JMC, 2004, 47, 2062



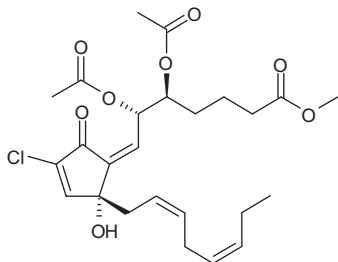
### 615 Punaglandin 2 acetate

Type: Cyclopentyl-oxylipins.  $C_{29}H_{41}ClO_{11}$   $[\alpha]_D = +10^\circ$  ( $c = 0.6$ , MeOH). Source: Octacoral *Telesto riisei*. Pharm: Anti-inflammatory. Ref: B. J. Baker, et al, JNP, 1994, 57, 1346



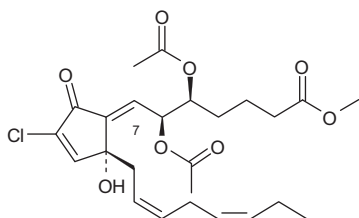
### 616 (Z)-Punaglandin 3

Type: Cyclopentyl-oxylipins.  $C_{25}H_{33}ClO_8$  Oil. Source: Octacoral *Telesto riisei* (Hawaii). Pharm: Cytotoxic (potent); anti-inflammatory (potent). Ref: B. J. Baker, et al, JNP, 1994, 57, 1346

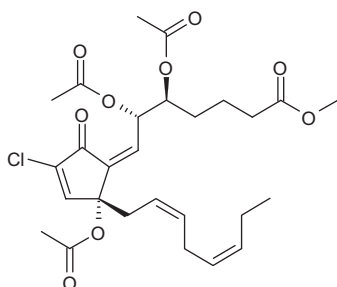


**617 (E)-Punaglandin 3**

Methyl 5,6-bis(acetyloxy)-10-chloro-12-hydroxy-9-oxoprostanoic acid 7,10,14,17-tetraen-1-yl ester  
Type: Cyclopentyl-oxylipins.  $C_{25}H_{33}ClO_8$  Oil,  $[\alpha]_D = +66.8^\circ$  ( $c = 0.5$ , MeOH). Source: Octocorals *Teleso riisei* (Japan waters waters) and *Teleso riisei* (Hawaii), stolonifer *Carijoa* sp. (Indo-Pacific). Pharm: Cytotoxic (HCT116,  $EC_{50} = (0.29-0.37) \mu\text{mol/L}$ ) (4 assays: with/without p53, with/without p21, ability to cause apoptosis is p53-independent); anti-inflammatory. Ref: B. J. Baker, et al, JACS, 1985, 107, 2976 | H. Sasai, et al, Tet. Lett., 1987, 28, 333 | B. J. Baker, et al, JNP, 1994, 57, 1346 | M. L. Ciavatta, et al, Tet. Lett., 2004, 45, 7745 | S. M. Verbitski, et al, JMC, 2004, 47, 2062

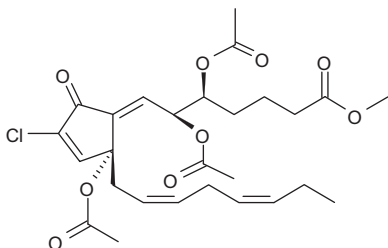
**618 (Z)-Punaglandin 3 acetate**

Type: Cyclopentyl-oxylipins.  $C_{27}H_{35}ClO_9$   $[\alpha]_D = +19^\circ$  ( $c = 1.8$ ,  $\text{CHCl}_3$ ). Source: Octocoral *Teleso riisei*, stolonifer *Carijoa* sp. Pharm: Anti-inflammatory. Ref: B. J. Baker, et al, JNP, 1994, 57, 1346 | M. L. Ciavatta, et al, Tet. Lett., 2004, 45, 7745

**619 (E)-Punaglandin 3 acetate**

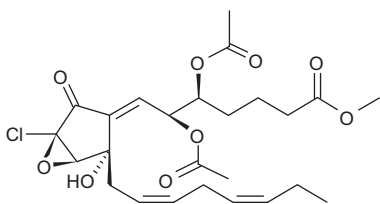
Type: Cyclopentyl-oxylipins.  $C_{27}H_{35}ClO_9$   $[\alpha]_D = +31^\circ$  ( $c = 2.7$ ,  $\text{CHCl}_3$ ). Source: Octocoral *Teleso riisei* (Indo-Pacific), stolonifer *Carijoa* sp. (Indo-Pacific). Pharm: Anti-inflammatory. Ref: B. J. Baker, et al, JNP, 1994, 57, 1346 | M. L. Ciavatta, et al, Tet. Lett., 2004, 45, 7745





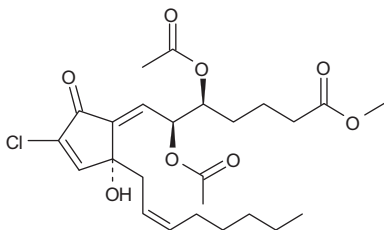
### 620 (*E*)-Punaglandin 3 epoxide

**Type:** Cyclopentyl-oxylipins.  $C_{25}H_{33}ClO_9$ ,  $[\alpha]_D = +16^\circ$  ( $c = 3$ , MeOH). **Source:** Octocoral *Teleso riisei* (Hawaii). **Pharm:** Anti-inflammatory. **Ref:** B. J. Baker, et al, JNP, 1994, 57, 1346



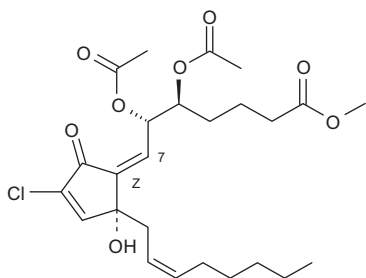
### 621 (*E*)-Punaglandin 4

**Type:** Cyclopentyl-oxylipins.  $C_{25}H_{35}BrO_8$  Oil,  $[\alpha]_D^{24} = +72.3^\circ$  ( $c = 0.52$ ,  $CHCl_3$ ). **Source:** Octocoral *Teleso riisei* (Hawaii). **Pharm:** Cytotoxic (HCT116,  $EC_{50} = (0.28-0.35) \mu\text{mol/L}$ ) (4 assaies: with/without p53, with/without p21, ability to cause apoptosis is p53-independent); cytotoxic (RKO,  $EC_{50} = 0.31 \mu\text{mol/L}$ ; RKO-E6,  $EC_{50} = 0.37 \mu\text{mol/L}$ , cytotoxicity mechanism of punaglandins is p53-independent: RKO cells with competent p53 and RKO-E6 cells with disrupted p53); anti-inflammatory. **Ref:** B. J. Baker, et al, JACS, 1985, 107, 2976 | B. J. Baker, et al, JNP, 1994, 57, 1346 | S. M. Verbitski, et al, JMC, 2004, 47, 2062

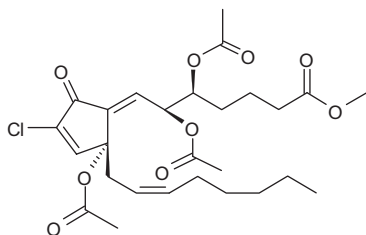


**622 (Z)-Punaglandin 4**

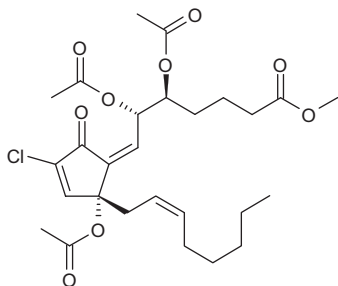
(Z)-PNG 4 Type: Cyclopentyl-oxylipins.  $C_{25}H_{35}ClO_8$  Oil. Source: Octocoral *Telesto riisei* (Hawaii). Pharm: Cytotoxic (HCT116,  $EC_{50} = (0.027-0.032) \mu\text{mol/L}$  (4 assaies: with/without p53, with/without p21), ability to cause apoptosis is p53-independent). Ref: B. J. Baker, et al, JACS, 1985, 107, 2976 | B. J. Baker, et al, JNP, 1994, 57, 1346 | S. M. Verbitski, et al, JMC, 2004, 47, 2062

**623 (E)-Punaglandin 4 acetate**

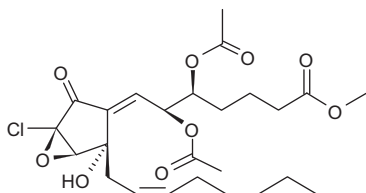
Type: Cyclopentyl-oxylipins.  $C_{27}H_{37}ClO_9$  Source: Octocoral *Telesto riisei*, stolonifer *Carijoa* sp. Pharm: Anti-inflammatory. Ref: B. J. Baker, et al, JNP, 1994, 57, 1346 | M. L. Ciavatta, et al, Tet. Lett., 2004, 45, 7745

**624 (Z)-Punaglandin 4 acetate**

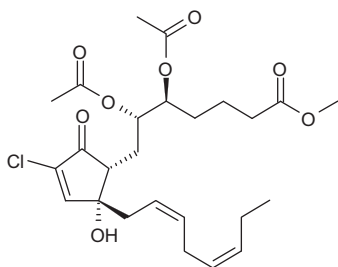
Type: Cyclopentyl-oxylipins.  $C_{27}H_{37}ClO_9$   $[\alpha]_D = +11^\circ$  ( $c = 1.8, \text{CHCl}_3$ ). Source: Octocoral *Telesto riisei*, stolonifer *Carijoa* sp. Pharm: Anti-inflammatory. Ref: B. J. Baker, et al, JNP, 1994, 57, 1346 | M. L. Ciavatta, et al, Tet. Lett., 2004, 45, 7745

**625 (E)-Punaglandin 4 epoxide**

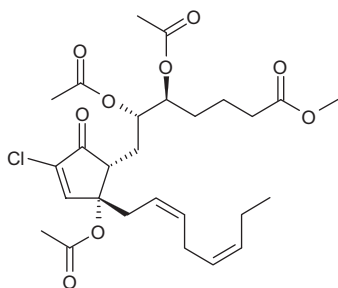
**Type:** Cyclopentyl-oxylipins.  $C_{25}H_{35}ClO_9$   $[\alpha]_D = +22.5^\circ$  ( $c = 0.8$ , MeOH). **Source:** Octocoral *Telesto riisei* (Hawaii). **Pharm:** Anti-inflammatory. **Ref:** B. J. Baker, et al, JNP, 1994, 57, 1346

**626 Punaglandin 5**

**Type:** Cyclopentyl-oxylipins.  $C_{25}H_{35}ClO_8$   $[\alpha]_D = +10.2^\circ$  ( $c = 4.7$ ,  $CHCl_3$ ). **Source:** Octocoral *Telesto riisei* (Hawaii). **Pharm:** Cytotoxic. **Ref:** B. J. Baker, et al, JNP, 1994, 57, 1346

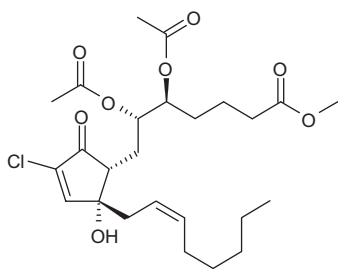
**627 Punaglandin 5 acetate**

**Type:** Cyclopentyl-oxylipins.  $C_{27}H_{37}ClO_9$   $[\alpha]_D = +8^\circ$  ( $c = 1.2$ , MeOH). **Source:** Octocoral *Telesto riisei*. **Pharm:** Anti-inflammatory. **Ref:** B. J. Baker, et al, JNP, 1994, 57, 1346



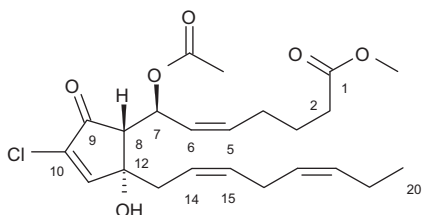
### 628 Punaglandin 6

**Type:** Cyclopentyl-oxylipins.  $C_{25}H_{37}ClO_8$   $[\alpha]_D = +14^\circ$  ( $c = 0.9$ ,  $CHCl_3$ ). **Source:** Octocoral *Telesto riisei* (Hawaii). **Pharm:** Cytotoxic (HCT116,  $EC_{50} = (0.32-0.36) \mu\text{mol/L}$ ; 4 assays: with/without p53, with/without p21, ability to cause apoptosis is p53-independent); cytotoxic (RKO,  $EC_{50} = 0.44 \mu\text{mol/L}$ ; RKO-E6,  $EC_{50} = 0.47 \mu\text{mol/L}$ , cytotoxicity mechanism of punaglandins is p53-independent: RKO cells with competent p53 and RKO-E6 cells with disrupted p53); anti-inflammatory. **Ref:** B. J. Baker, et al, JNP, 1994, 57, 1346 | S. M. Verbitski, et al, JMC, 2004, 47, 2062



### 629 Punaglandin 7

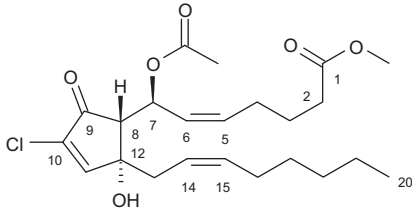
**Type:** Cyclopentyl-oxylipins.  $C_{23}H_{31}ClO_6$  **Source:** Octocoral *Telesto riisei*. **Pharm:** Cytotoxic; anti-inflammatory. **Ref:** B. J. Baker, et al, JNP, 1994, 57, 1346



### 630 (5Z)-Punaglandin 8

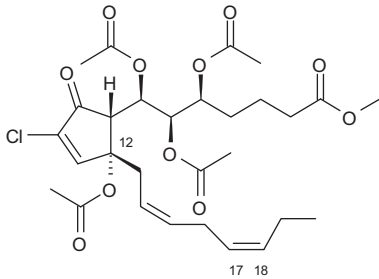
7-Acetoxy-7,8-dihydrochlorovulone I **Type:** Cyclopentyl-oxylipins.  $C_{23}H_{33}ClO_6$  Oil,  $[\alpha]_D = +43.9^\circ$  ( $c = 0.04$ ,  $CHCl_3$ ). **Source:** Stolonifer *Clavularia viridis* (Okinawa),

octocoral *Telesto riisei*. Pharm: Cytotoxic; anti-inflammatory. Ref: B. J. Baker, et al, JNP, 1994, 57, 1346 | K. Watanabe, et al, JNP, 2001, 64, 1421



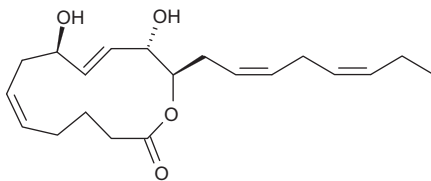
### 631 Punaglandin 1 acetate

Type: Cyclopentyl-oxylipins.  $C_{29}H_{39}ClO_{11}$  Source: Octacoral *Telesto riisei*. Pharm: Anti-inflammatory. Ref: B. J. Baker, et al, JNP, 1994, 57, 1346



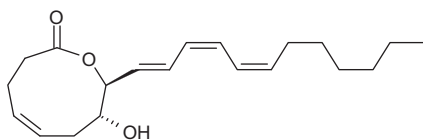
### 632 Amphidinolactone A

Type: Oxylipin lactones.  $C_{20}H_{30}O_4$   $[\alpha]_D = -62^\circ$  ( $C_6H_6$ ). Source: Dinoflagellate *Amphidinium* sp. Pharm: Cytotoxic ( $L_{1210}$ ,  $IC_{50} = 8 \mu\text{g/mL}$ ; KB,  $IC_{50} > 10 \mu\text{g/mL}$ ). Ref: Y. Takahashi, et al, Heterocycles, 2007, 72, 567 | J. Kobayashi, et al, J. Antibiot., 2008, 61(5), 271 (rev)



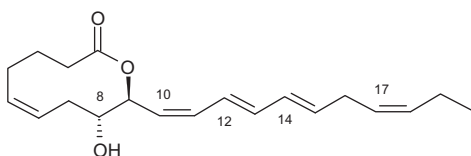
### 633 Ascidiatrienolide A

Type: Oxylipin lactones.  $C_{20}H_{30}O_3$   $[\alpha]_D = -14.8^\circ$  ( $c = 4.5$ ,  $CHCl_3$ ). Source: Ascidian *Didemnum candidum*. Pharm:  $PLA_2$  inhibitor. Ref: N. Lindquist, et al, Tet. Lett., 1989, 30, 2735 | M. S. Congreve, et al, JACS, 1993, 115, 5815



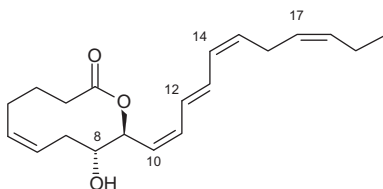
### 634 Didemnilactone A

Didemnilactone Type: Oxylipin lactones.  $C_{20}H_{28}O_3$  Oil,  $[\alpha]_D^{22} = -190^\circ$  ( $c = 0.18$ , MeOH). Source: Ascidian *Didemnum moseleyi*. Pharm: 5-Lipoxygenase inhibitor (PMNL,  $IC_{50} = 9.4 \mu\text{mol/L}$ ); 15-lipoxygenase inhibitor (PMNL,  $IC_{50} = 41 \mu\text{mol/L}$ ); binds to Leukotriene  $B_4$  receptor (hmn polymorphonuclear leukocyte (PMNL),  $IC_{50} = 38 \mu\text{mol/L}$ ). Ref: H. Niwa, et al, Tetrahedron, 1994, 50, 7385



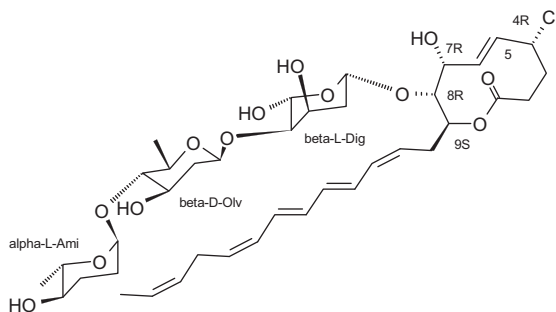
### 635 Didemnilactone B

Type: Oxylipin lactones.  $C_{20}H_{28}O_3$  Oil,  $[\alpha]_D^{25} = -378^\circ$  ( $c = 0.005$ , MeOH). Source: Ascidian *Didemnum moseleyi* (Japan waters waters). Pharm: 5-Lipoxygenase inhibitor; 15-lipoxygenase inhibitor; binds to leukotriene  $B_4$  receptors (weakly). Ref: H. Niwa, et al, Tetrahedron, 1994, 25, 7385



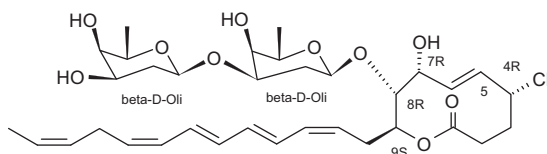
### 636 Latrunculinoside A

Latrunculin A 8-*O*-[2,3,6-trideoxy- $\alpha$ -*L*-erythro-hexopyranosyl-(1 $\rightarrow$ 4)-2,6-dideoxy- $\beta$ -*D*-arabino-hexopyranosyl-(1 $\rightarrow$ 4)-2,6-dideoxy- $\beta$ -*L*-ribo-hexopyranoside] Type: Oxylipin lactones.  $C_{39}H_{57}ClO_{13}$  Powder,  $[\alpha]_D^{23} = +72^\circ$  ( $c = 0.13$ , MeOH). Source: Sponge *Latrunculia corticata* (Red Sea). Pharm: Antifeedant (Aquarium assay, feeding by goldfish on pellets treated with glycoside). Ref: T. Rezanka, et al, EurJOC, 2003, 2144



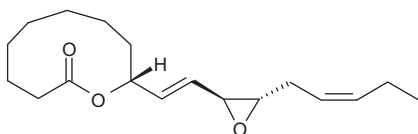
### 637 Latrunculoside B

(5Z)-Latrunculin A 8-*O*-[2,6-dideoxy- $\beta$ -*D*-lyxo-hexopyranosyl-(1 $\rightarrow$ 3)-2,6-dideoxy- $\beta$ -*D*-lyxo-hexopyranoside] **Type:** Oxylin lactones.  $C_{34}H_{49}ClO_{10}$  Powder,  $[\alpha]_D^{22} = -18.5^\circ$  ( $c = 0.09$ , MeOH). **Source:** Sponge *Latrunculia corticata* (Red Sea). **Pharm:** Antifeedant (Aquarium assay, feeding by goldfish on pellets treated with glycoside). **Ref:** T. Rezanka, et al, EurJOC, 2003, 2144



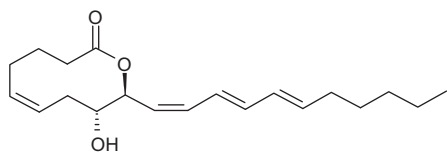
### 638 Mueggelone

Gloeolactone **Type:** Oxylin lactones.  $C_{18}H_{28}O_3$  Oil,  $[\alpha]_D^{25} = +13.00^\circ$  ( $c = 0.01$ , MeOH),  $[\alpha]_D^{25} = +28.30^\circ$  ( $c = 0.6$ ,  $CHCl_3$ ). **Source:** Cyanobacteria *Aphanizomenon flos-aquae* and *Gloeotrichia* sp. **Pharm:** Fish development inhibitor; antimycobacterial. **Ref:** O. Papendorf, et al, JNP, 1997, 60, 1298 | D. B. Stierle, et al, JNP, 1998, 61, 251 | G. M. Koenig, et al, PM, 2000, 66, 337

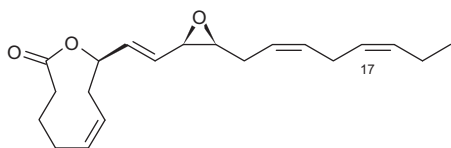


### 639 Neodidemnilactone

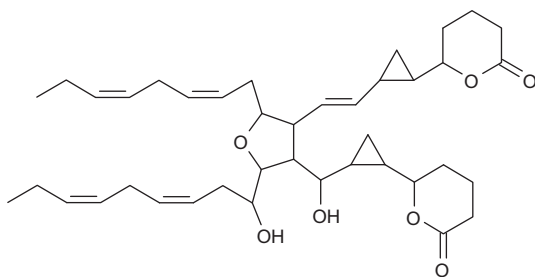
**Type:** Oxylin lactones.  $C_{20}H_{30}O_3$  Oil,  $[\alpha]_D^{22} = -200^\circ$  ( $c = 0.17$ , MeOH). **Source:** Ascidian *Didemnum moseleyi*. **Pharm:** Binds to Leukotriene  $B_4$  receptor (hmn polymorphonuclear leukocyte (PMNL),  $IC_{50} = 38 \mu\text{mol/L}$ ). **Ref:** H. Niwa, et al, Tetrahedron, 1994, 50, 7385

**640 Topsisentolide A<sub>1</sub>**

**Type:** Oxylipin lactones.  $C_{20}H_{28}O_3$  Oil,  $[\alpha]_D^{24} = +59.4^\circ$  ( $c = 0.11$ , MeOH). **Source:** Sponge *Topsisentia* sp. **Pharm:** Cytotoxic (moderate). **Ref:** X. Luo, et al, JNP, 2006, 69, 567 | M. Kobayashi, et al, Tet. Lett., 2010, 51, 2762

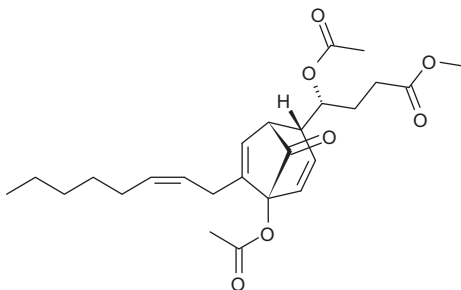
**641 Aplydilactone**

**Type:** Bicarboyclic oxylipins.  $C_{40}H_{58}O_7$  Oil,  $[\alpha]_D^{27} = -1.63^\circ$  ( $c = 1.00$ ,  $CHCl_3$ ). **Source:** Sea hare *Aplysia kurodai*. **Pharm:** PLA<sub>2</sub> activator. **Ref:** M. Ojika, et al, Tet. Lett., 1990, 31, 4907

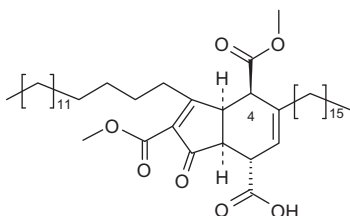
**642 Clavubicyclone**

**Type:** Bicarboyclic oxylipins.  $C_{25}H_{34}O_7$  Oil,  $[\alpha]_D^{25} = -59.4^\circ$  ( $c = 0.53$ ,  $CHCl_3$ ). **Source:** Stonifer *Clavularia viridis*. **Pharm:** Prostanoid-related oxylipin. **Ref:** M. Iwashima, et al, JOC, 2002, 67, 2977

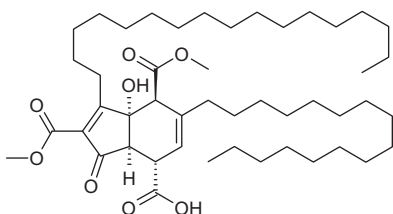


**643 Manzamenone A**

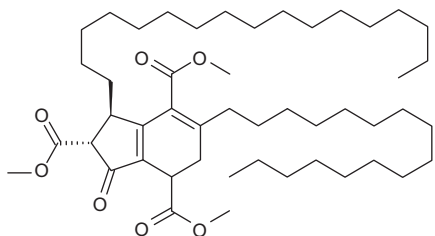
Type: Bicarbocyclic oxylipins.  $C_{46}H_{78}O_7$  Colorless oil,  $[\alpha]_D^{17} = -3.0^\circ$  ( $c = 1.3$ ,  $CHCl_3$ ).  
Source: Sponge *Plakortis* sp. (Okinawa). Pharm: PKC inhibitor Ref: S. Tsukamoto, et al, JOC, 1992, 57, 5255

**644 Manzamenone M**

Type: Bicarbocyclic oxylipins.  $C_{47}H_{80}O_8$  Source: Sponge *Plakortis* sp. (Manzamo, Okinawa). Pharm: Antibacterial (*Escherichia coli*, *Staphylococcus aureus* and *Cryptococcus neoformans*). Ref: T. Kubota, et al, Bioorg. Med. Chem. Lett., 2013, 23, 244

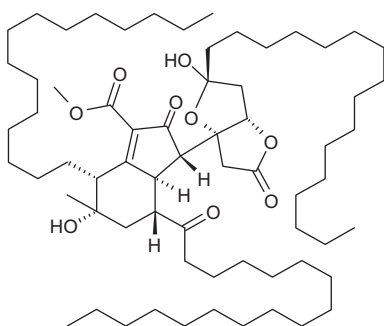
**645 Manzamenone N**

Type: Bicarbocyclic oxylipins.  $C_{48}H_{82}O_7$  Source: Sponge *Plakortis* sp. (Manzamo, Okinawa). Pharm: Antibacterial (*Escherichia coli*, *Staphylococcus aureus* and *Cryptococcus neoformans*). Ref: T. Kubota, et al, Bioorg. Med. Chem. Lett., 2013, 23, 244



### 646 Manzamenone O

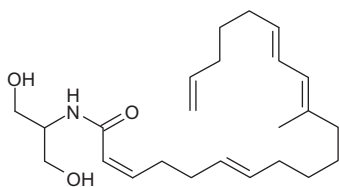
**Type:** Bicarbocyclic oxylipins.  $C_{66}H_{116}O_9$  **Source:** Sponge *Plakortis* sp. (Manzamo, Okinawa). **Pharm:** Antimicrobial (moderate). **Ref:** N. Tanaka, et al, *Org. Lett.*, 2013, 15, 2518



## 1.10 Acylglycerols

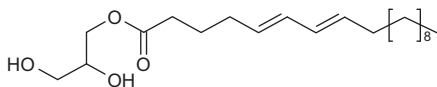
### 647 Mooreamide A

**Type:** Monoacylglycerols.  $C_{24}H_{39}NO_3$  **Source:** Cyanobacterium *Moorea bouillonii* **Pharm:** Neuroreceptor CB1 inhibitor (most potent marine-derived CB1 inhibitor reported to date). **Ref:** E. Mevers, et al, *Lipids*, 2014, 49, 1127

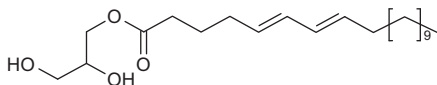


### 648 Unsaturated fatty acid glycerol ester 3

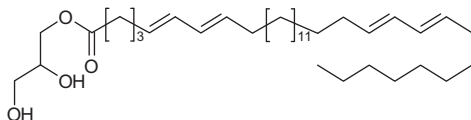
**Type:** Monoacylglycerols.  $C_{21}H_{38}O_4$  **Source:** Marine-derived fungus *Aspergillus* sp. MF-93 (from sea water, China waters). **Pharm:** Antiviral (inhibits multiplication of TMV, 0.2 mg/mL, InRt = 12.5%). **Ref:** Z. -J. Wu, et al, *Pest Manag. Sci.*, 2009, 65, 60

**649 Unsaturated fatty acid glycerol ester 4**

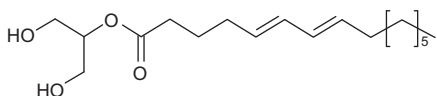
**Type:** Monoacylglycerols.  $C_{22}H_{40}O_4$  **Source:** Marine-derived fungus *Aspergillus* sp. MF-93 (from sea water, China waters). **Pharm:** Antiviral (inhibits multiplication of TMV, 0.2 mg/mL, InRt = 14.9%). **Ref:** Z. -J. Wu, et al, Pest Manag. Sci., 2009, 65, 60

**650 Unsaturated fatty acid glycerol ester 5**

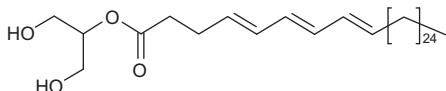
**Type:** Monoacylglycerols.  $C_{37}H_{66}O_4$  **Source:** Marine-derived fungus *Aspergillus* sp. MF-93 (from sea water, China waters). **Pharm:** Antiviral (inhibits multiplication of TMV, 0.2 mg/mL, InRt = 17.4%). **Ref:** Z. -J. Wu, et al, Pest Manag. Sci., 2009, 65, 60

**651 Unsaturated fatty acid glycerol ester 6**

**Type:** Monoacylglycerols.  $C_{18}H_{32}O_4$  **Source:** Marine-derived fungus *Aspergillus* sp. MF-93 (from sea water, China waters). **Pharm:** Antiviral (inhibits multiplication of TMV, 0.2 mg/mL, InRt = 14.2%). **Ref:** Z. -J. Wu, et al, Pest Manag. Sci., 2009, 65, 60

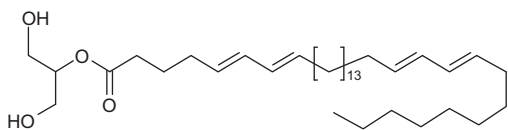
**652 Unsaturated fatty acid glycerol ester 7**

**Type:** Monoacylglycerols.  $C_{37}H_{68}O_4$  **Source:** Marine-derived fungus *Aspergillus* sp. MF-93 (from sea water, China waters). **Pharm:** Antiviral (inhibits multiplication of TMV, 0.2 mg/mL, InRt = 13.9%). **Ref:** Z. -J. Wu, et al, Pest Manag. Sci., 2009, 65, 60

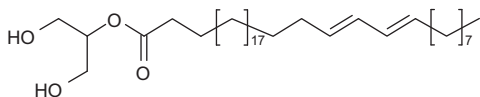


**653 Unsaturated fatty acid glycerol ester 8**

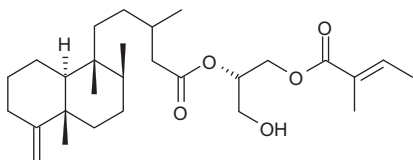
Type: Monoacylglycerols.  $C_{37}H_{66}O_4$  Source: Marine-derived fungus *Aspergillus* sp. MF-93 (from sea water, China waters). Pharm: Antiviral (inhibits multiplication of TMV, 0.2 mg/mL, InRt = 14.3%). Ref: Z. -J. Wu, et al, Pest Manag. Sci., 2009, 65, 60

**654 Unsaturated fatty acid glycerol ester 9**

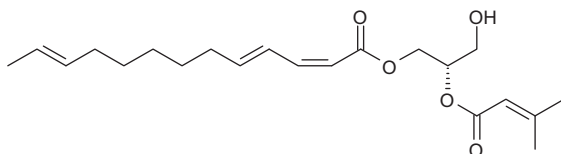
Type: Monoacylglycerols.  $C_{37}H_{70}O_4$  Source: Marine-derived fungus *Aspergillus* sp. MF-93 (from sea water, China waters). Pharm: Antiviral (inhibits multiplication of TMV, 0.2 mg/mL, InRt = 16.3%). Ref: Z. -J. Wu, et al, Pest Manag. Sci., 2009, 65, 60

**655 Archidorin**

Type: Diacylglycerols.  $C_{28}H_{46}O_5$  Amorph. powder,  $[\alpha]_D^{25} = +12.1^\circ$  ( $c = 0.3$ ,  $CHCl_3$ ). Source: Nudibranch *Archidoris tuberculata* and *Archidoris pseudoargus*. Pharm: Ichthyotoxic. Ref: G. Cimino, et al, JNP, 1993, 56, 1642

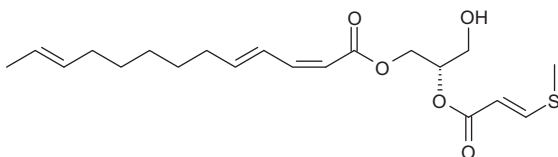
**656 Umbraculumin A**

Glycerol 2-(3-methyl-2-butenoate) 1-(2,4,11-tridecatrienoate) Type: Diacylglycerols.  $C_{21}H_{32}O_5$   $[\alpha]_D = -24.3^\circ$  ( $c = 0.8$ ,  $CHCl_3$ ). Source: Notapsid *Umbraculum mediterraneum*. Pharm: Ichthyotoxic. Ref: G. Cimino, et al, Tet. Lett., 1988, 29, 3613 | E. F. De Madeiros, et al, JCS Perkin I, 1991, 2725

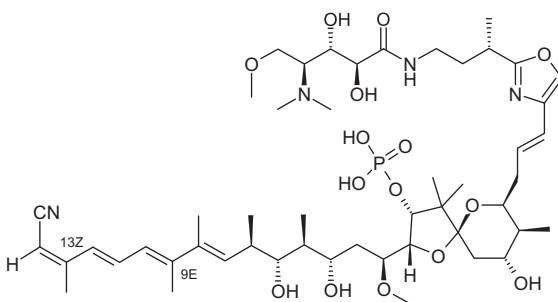


**657 Umbraculumin C**

Glycerol 2-(3-methylthio-2-propenoate) 1-(2,4,11-tridecatrienoate) Type: Diacylglycerols.  $C_{20}H_{30}O_5S$   $[\alpha]_D = +7^\circ$  ( $c = 0.5$ ,  $CHCl_3$ ). Source: Notapsid *Umbraculum mediterraneum*. Pharm: Ichthyotoxic. Ref: G. Cimino, et al, Tet. Lett., 1988, 29, 3613 | E. F. De Madeiros, et al, JCS Perkin I, 1991, 2725

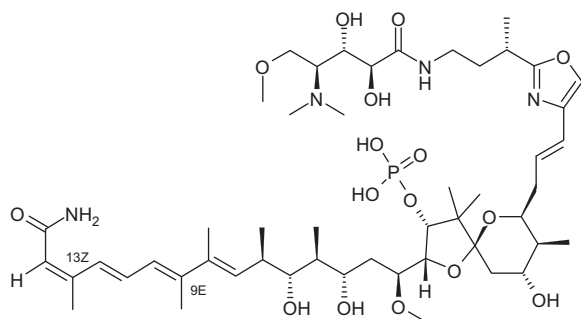
**1.11 Phospholipids****658 Calyculin A**

Type: Phospholipids.  $C_{50}H_{81}N_4O_{15}P$  Needles ( $Me_2CO/Et_2O$ /hexane), mp 247–249 °C,  $[\alpha]_D^{15} = +59.8^\circ$  ( $c = 0.12$ , EtOH). Source: Lithistid sponge *Discodermia calyx*, sponge *Lamellomorpha strongylata*. Pharm: Serine-threonine phosphatase Inhibitor; cytotoxic ( $L_{1210}$ ,  $IC_{50} = 0.00074 \mu\text{g/mL}$ ); cell growth inhibitor (starfish *Asterina pectinifera*,  $IC_{50} = 0.02 \mu\text{g/mL}$ , sea urchin *Hemicentrotus pulcherrimus* eggs,  $IC_{50} = 0.01 \mu\text{g/mL}$ ); antineoplastic (mus Ehrlich,  $P_{388}$ ,  $T/C = 245.8\%$ ,  $144.4\%$  at  $15 \mu\text{g/kg}$  respectively); PP1 inhibitor ( $IC_{50} = 0.4\text{--}2.0 \text{ nmol/L}$ ); PP2A inhibitor ( $IC_{50} = 0.25\text{--}3.0 \text{ nmol/L}$ ); apoptosis inducer. Ref: Y. Kato, et al, JACS, 1986, 108, 2780 | Y. Kato, et al, JOC, 1988, 53, 3930 | S. Matsunaga, et al, Tetrahedron, 1991, 47, 2999 | B. Smith III, et al, JOC, 1998, 63, 7596 | A. K. Ogawa, et al, JACS, 1998, 120, 12435 | A. B. Smith III, et al, JACS, 1999, 121, 10478 | A. E. Fagerholm, et al, Mar. Drugs, 2010, 8, 122

**659 Calyculinamide A**

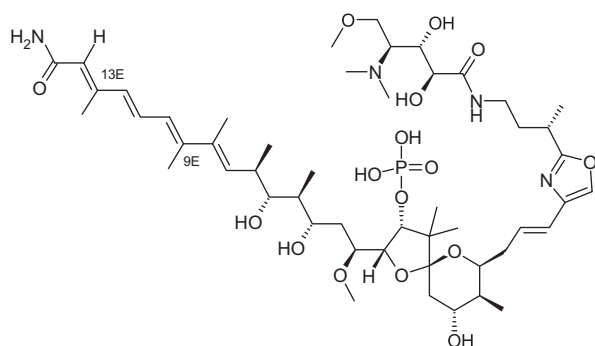
Type: Phospholipids.  $C_{50}H_{83}N_4O_{16}P$   $[\alpha]_D = -18^\circ$  ( $c = 0.005$ , MeOH),  $[\alpha]_D = -41^\circ$  ( $c = 0.5$ , EtOH). Source: Lithistid sponge *Discodermia calyx* (Japan waters), sponge

*Lamellomorpha strongylata* (New Zealand). **Pharm:** Cytotoxic (NCI's *in vitro* 60 cell line screening system, mean  $\text{Log}_{10} \text{GI}_{50}$  (mol/L) =  $-10.14$  ( $\Delta = 0.46$ , range = 1.49); mean  $\text{Log}_{10} \text{TGI}$  (mol/L) =  $-9.60$  ( $\Delta = 1.00$ , range = 3.04); mean  $\text{Log}_{10} \text{LC}_{50}$  (mol/L) =  $-9.09$  ( $\Delta = 1.51$ , range = 4.00)); PP2A inhibitor. **Ref:** E. J. Dumdei, et al, JOC, 1997, 62, 2636 | Matsunaga, S. et al, JOC, 1997, 62, 2640 | S. Matsunaga, et al, JOC, 1997, 62, 9388 | S. Matsunaga, et al, Tet. Lett., 1997, 38, 3763 | A. E. Fagerholm, et al, Mar. Drugs, 2010, 8, 122



### 660 Calyculinamide B

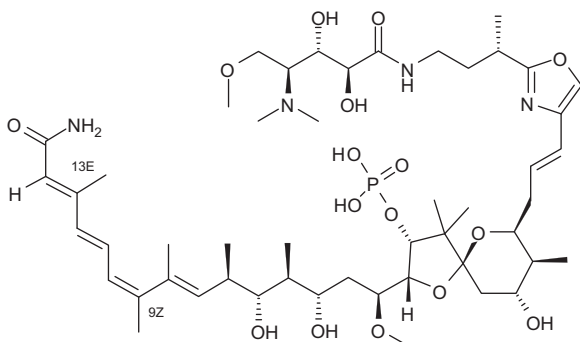
**Type:** Phospholipids.  $\text{C}_{50}\text{H}_{83}\text{N}_4\text{O}_{16}\text{P}$  Amorph. solid,  $[\alpha]_{\text{D}}^{20} = -27^\circ$  ( $c = 0.145$ , EtOH). **Source:** Sponge *Lamellomorpha strongylata* (New Zealand). **Pharm:** Cytotoxic (NCI's *in vitro* 60 cell line screening system, mean  $\text{Log}_{10} \text{GI}_{50}$  (mol/L) =  $-10.14$  ( $\Delta = 0.46$ , range = 1.49); mean  $\text{Log}_{10} \text{TGI}$  (mol/L) =  $-9.60$  ( $\Delta = 1.00$ , range = 3.04); mean  $\text{Log}_{10} \text{LC}_{50}$  (mol/L) =  $-9.09$  ( $\Delta = 1.51$ , range = 4.00)); PP inhibitor. **Ref:** E. J. Dumdei, et al, JOC, 1997, 62, 2636 | Matsunaga, S. et al, JOC, 1997, 62, 2640 | A. E. Fagerholm, et al, Mar. Drugs, 2010, 8, 122



### 661 Calyculinamide F

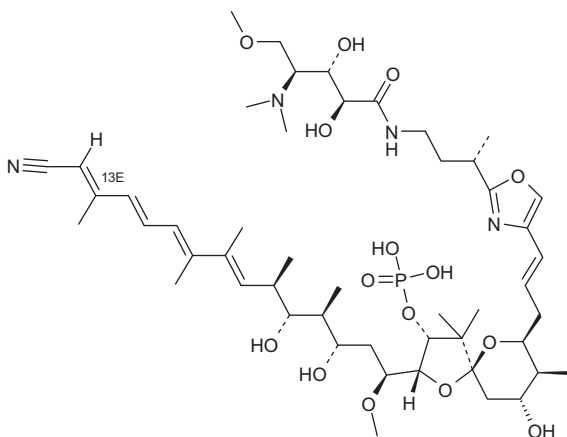
**Type:** Phospholipids.  $\text{C}_{50}\text{H}_{83}\text{N}_4\text{O}_{16}\text{P}$  Amorph. solid,  $[\alpha]_{\text{D}}^{20} = -23^\circ$  ( $c = 0.01$ , MeOH). **Source:** Lithistid sponge *Discodermia calyx*. **Pharm:** PP inhibitor. **Ref:**

E. J. Dumdei, et al, JOC, 1997, 62, 2636 | S. Matsunaga, et al, JOC, 1997, 62, 2640 | A. E. Fagerholm, et al, Mar. Drugs, 2010, 8, 122



### 662 Calyculin B

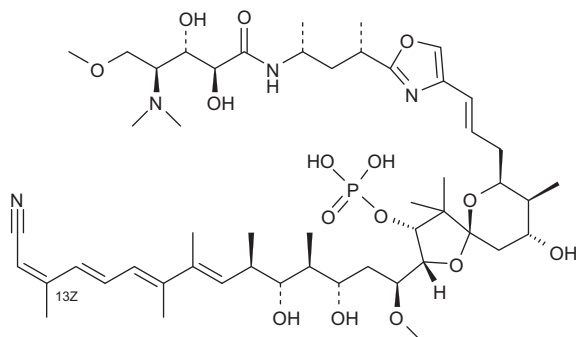
**Type:** Phospholipids.  $C_{50}H_{81}N_4O_{15}P$  Amorph.,  $[\alpha]_D = -61^\circ$  ( $c = 0.05$ , EtOH). **Source:** Lithistid sponge *Discodermia calyx*, sponge *Lamellomorpha strongylata*. **Pharm:** Serine-threonine phosphatase inhibitor; cell growth inhibitor (starfish *Asterina pectinifera*,  $IC_{50} = 0.02 \mu\text{g/mL}$ , sea urchin *Hemicentrotus pulcherrimus* eggs,  $IC_{50} = 0.01 \mu\text{g/mL}$ ); cytotoxic ( $L_{1210}$ ,  $IC_{50} = 0.00088 \mu\text{g/mL}$ ). **Ref:** Y. Kato, et al, JACS, 1986, 108, 2780 | Y. Kato, et al, 1988, 53, 3930 | B. Smith III, et al, JOC, 1998, 63, 7596 | A. K. Ogawa, et al, JACS, 1998, 120, 12435 | A. B. Smith III, et al, JACS, 1999, 121, 10478 | A. E. Fagerholm, et al, Mar. Drugs, 2010, 8, 122



### 663 Calyculin C

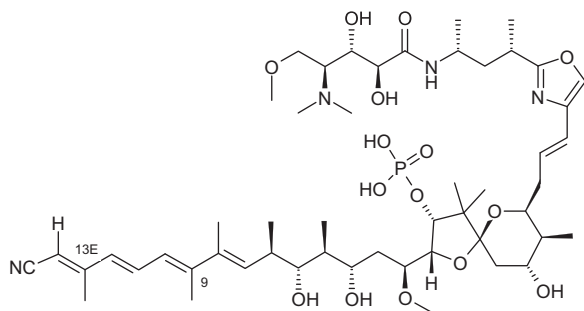
**Type:** Phospholipids.  $C_{51}H_{83}N_4O_{15}P$  Amorph.,  $[\alpha]_D = -65^\circ$  ( $c = 0.05$ , EtOH). **Source:** Lithistid sponge *Discodermia calyx*. **Pharm:** Cytotoxic ( $L_{1210}$ ); smooth muscle contractor; PP1 Inhibitor ( $IC_{50} = 0.6 \text{ nmol/L}$ ); PP2A Inhibitor

(IC<sub>50</sub> = 2.8 nmol/L). Ref: Y. Kato, et al, JACS, 1986, 108, 2780 | Y. Kato, et al, JOC, 1988, 53, 3930 | B. Smith III, et al, JOC, 1998, 63, 7596 | A. K. Ogawa, et al, JACS, 1998, 120, 12435 | A. E. Fagerholm, et al, Mar. Drugs, 2010, 8, 122



#### 664 Calyculin D

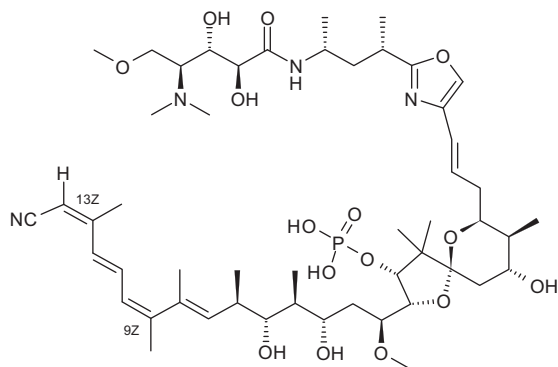
Type: Phospholipids. C<sub>51</sub>H<sub>83</sub>N<sub>4</sub>O<sub>15</sub>P Amorph., [α]<sub>D</sub> = -41° (c = 0.05, EtOH). Source: Lithistid sponge *Discodermia calyx*. Pharm: Antineoplastic; smooth muscle contractor; protein phosphatases inhibitor. Ref: Y. Kato, et al, JOC, 1988, 53, 3930 | A. E. Fagerholm, et al, Mar. Drugs, 2010, 8, 122



#### 665 Calyculin G

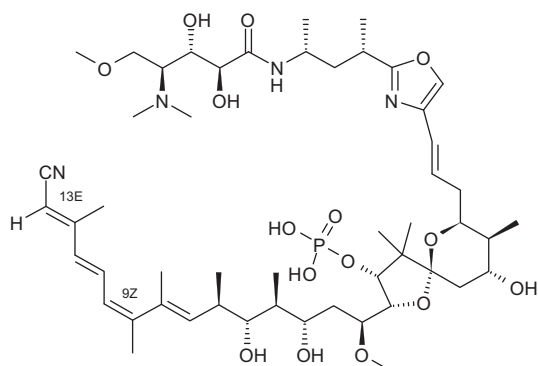
Type: Phospholipids. C<sub>51</sub>H<sub>83</sub>N<sub>4</sub>O<sub>15</sub>P [α]<sub>D</sub><sup>23</sup> = -81° (c = 0.1, EtOH). Source: Lithistid sponge *Discodermia calyx*. Pharm: Smooth muscle contractor; protein phosphatases inhibitor. Ref: S. Matsunaga, et al, Tetrahedron, 1991, 47, 2999 | A. E. Fagerholm, et al, Mar. Drugs, 2010, 8, 122





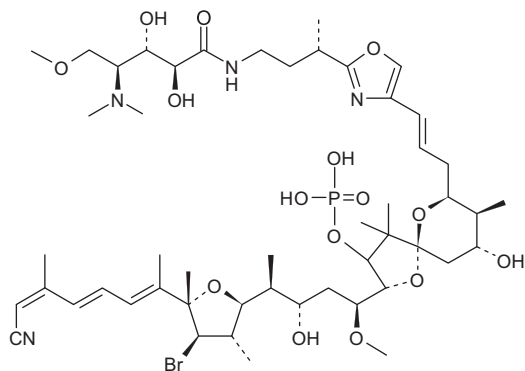
### 666 Calyculin H

**Type:** Phospholipids.  $C_{51}H_{83}N_4O_{15}P$   $[\alpha]_D^{23} = -36^\circ$  ( $c = 0.05$ , EtOH). **Source:** Lithistid sponge *Discodermia calyx*. **Pharm:** Smooth muscle contractor; protein phosphatases inhibitor. **Ref:** S. Matsunaga, et al, Tetrahedron, 1991, 47, 2999 | A. E. Fagerholm, et al, Mar. Drugs, 2010, 8, 122



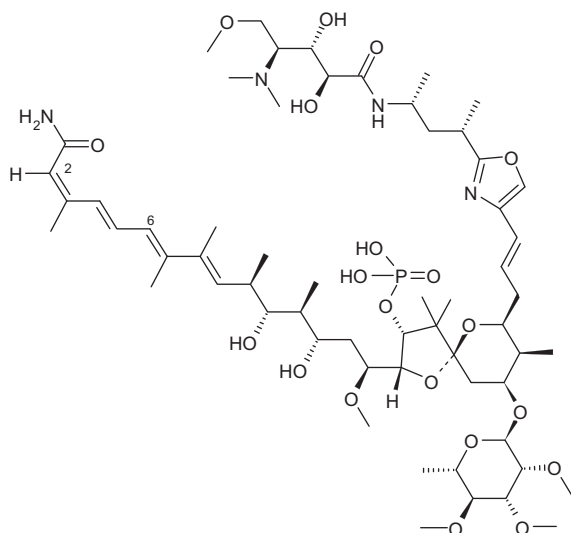
### 667 Calyculin J

**Type:** Phospholipids.  $C_{50}H_{80}BrN_4O_{15}P$  Yellow solid,  $[\alpha]_D^{20} = -10^\circ$  ( $c = 0.08$ , MeOH). **Source:** Lithistid sponge *Discodermia calyx* (Japan waters). **Pharm:** PP inhibitor. **Ref:** S. Matsunaga, et al, JOC, 1997, 62, 9388 | S. Matsunaga, et al, Tet. Lett., 1997, 38, 3763



### 668 Clavosine A

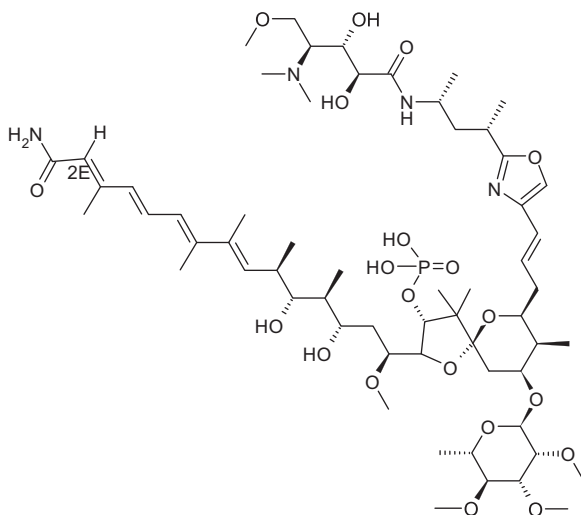
**Type:** Phospholipids.  $C_{60}H_{101}N_4O_{20}P$  Powder,  $[\alpha]_D = -5.0^\circ$  ( $c = 0.36$ ,  $CH_2Cl_2$ ). **Source:** Sponge *Myriastra clavosa* (Chuuk State, Federated States of Micronesia). **Pharm:** Cytotoxic (NCI's screening panel of 60 tumor cell lines, very potent, mean  $\text{Log}_{10} GI_{50}$  (mol/L) =  $-10.90$  ( $\Delta = 0.01$ , range =  $0.34$ ); mean  $\text{Log}_{10} TGI$  (mol/L) =  $-10.52$  ( $\Delta = 0.39$ , range =  $4.00$ )); mean  $\text{Log}_{10} LC_{50}$  (mol/L) =  $-9.80$  ( $\Delta = 1.10$ , range =  $4.00$ ); protein phosphatases inhibitor (native protein phosphatase-1 PP-1c from rabbit skeletal muscle,  $IC_{50} = 0.25$  nmol/L; hmn recombinant PP-1cy from *Escherichia coli*,  $IC_{50} = 0.5$  nmol/L; catalytic subunit of PP2A (PP-2Ac) from bovine heart,  $IC_{50} = 0.6$  nmol/L). **Ref:** X. Fu, et al, JOC, 1998, 63, 7957



### 669 Clavosine B

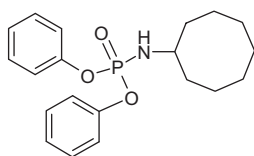
**Type:** Phospholipids.  $C_{60}H_{101}N_4O_{20}P$  Powder,  $[\alpha]_D = -3.2^\circ$  ( $c = 0.62$ ,  $CH_2Cl_2$ ). **Source:** Sponge *Myriastra clavosa* (Chuuk State, Federated States of Micronesia). **Pharm:**

Cytotoxic (NCI's screening panel of 60 tumor cell lines, very potent, mean  $\text{Log}_{10} \text{GI}_{50}$  (mol/L) =  $-10.79$  ( $\Delta = 0.11$ , range = 2.64); mean  $\text{Log}_{10} \text{TGI}$  (mol/L) =  $-10.28$  ( $\Delta = 0.62$ , range = 4.00)); mean  $\text{Log}_{10} \text{LC}_{50}$  (mol/L) =  $-9.28$  ( $\Delta = 1.62$ , range = 4.00)); protein phosphatases inhibitor (native protein phosphatase-1 PP-1c from rabbit skeletal muscle,  $\text{IC}_{50} = 13$  nmol/L; hmn recombinant PP-1cy from *Escherichia coli*,  $\text{IC}_{50} = 1.0$  nmol/L; catalytic subunit of PP2A (PP-2Ac) from bovine heart,  $\text{IC}_{50} = 1.2$  nmol/L). Ref: X. Fu, et al, JOC, 1998, 63, 7957



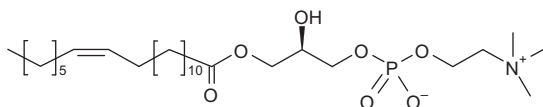
### 670 Diphenyl-cyclooctylphosphoramidate

PB-1 Type: Phospholipids.  $\text{C}_{20}\text{H}_{26}\text{NO}_3\text{P}$  Source: Dinoflagellate *Ptychodiscus brevis* [Syn. *Gymnodinium breve*]. Pharm: Toxin. Ref: M. DiNovi, et al, Tet. Lett., 1983, 24, 855

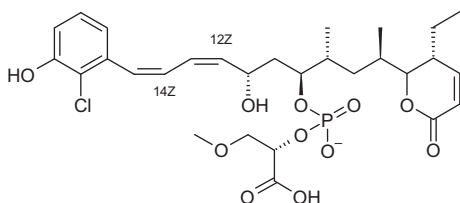


### 671 1-O-(13'-Z-Eicosaenoyl)-sn-glycero-3-phosphocholine

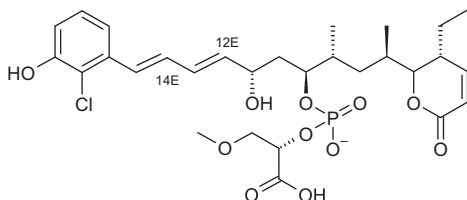
Type: Phospholipids.  $\text{C}_{28}\text{H}_{56}\text{NO}_7\text{P}$  Amorph. solid. Source: Sponge *Spirastrella abata* (Korea waters). Pharm: Cholesterol biosynthesis inhibitor ( $\text{IC}_{50} = 21$   $\mu\text{g}/\text{mL}$ ). Ref: B. A. Shin, et al, JNP, 1999, 62, 1554

**672 Franklinide A**

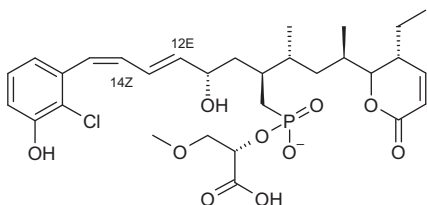
Type: Phospholipids.  $C_{29}H_{39}ClO_{11}P^{1-}$  Source: Sponges *Geodia* sp. and *Halichondria* sp. (complex, Great Australian Bight). Pharm: Cytotoxic. Ref: H. Zhang, et al, *Angew. Chem., Int. Ed.*, 2010, 49, 9904

**673 Franklinide B**

Type: Phospholipids.  $C_{29}H_{39}ClO_{11}P^{1-}$  Source: Sponges *Geodia* sp. and *Halichondria* sp. (complex, Great Australian Bight). Pharm: Cytotoxic. Ref: H. Zhang, et al, *Angew. Chem., Int. Ed.*, 2010, 49, 9904

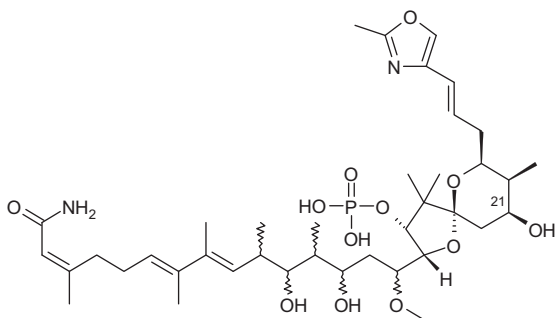
**674 Franklinide C**

Type: Phospholipids.  $C_{29}H_{39}ClO_{11}P^{1-}$  Source: Sponges *Geodia* sp. and *Halichondria* sp. (complex, Great Australian Bight). Pharm: Cytotoxic. Ref: H. Zhang, et al, *Angew. Chem., Int. Ed.*, 2010, 49, 9904

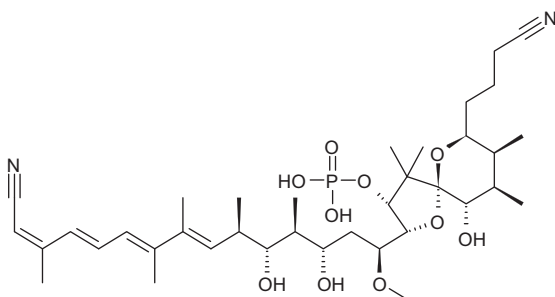


**675 Geometricin A**

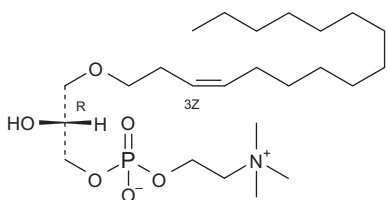
**Type:** Phospholipids.  $C_{39}H_{63}N_2O_{12}P$  Amorph. solid,  $[\alpha]_D^{23} = -36.3^\circ$  ( $c = 0.29$ , MeOH).  
**Source:** Sponge *Luffariella geometrica*. **Pharm:** Cytotoxic (HM02,  $GI_{50} = 1.7 \mu\text{g/mL}$ ; HepG2,  $GI_{50} = 2.8 \mu\text{g/mL}$ ); antialgal (50  $\mu\text{g}$  level, IZD = 5 mm). **Ref:** S. Kehraus, et al, JNP, 2002, 65, 1056

**676 Hemicalculin**

**Type:** Phospholipids.  $C_{37}H_{59}N_2O_{10}P$  **Source:** Lithistid sponge *Discodermia calyx* (off Sikine-jima I., Japan). **Pharm:** PP1 inhibitor ( $IC_{50} = 14.2 \text{ nmol/L}$ ); PP2A inhibitor ( $IC_{50} = 1.0 \text{ nmol/L}$ ). **Ref:** P. L. Winder, et al, Mar. Drugs, 2011, 9, 2644 (rev)

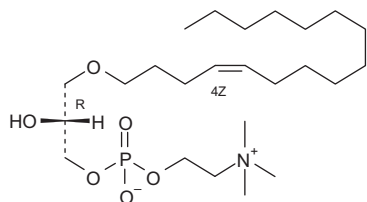
**677 1-(3Z-Hexadecenyl)glycero-3-phosphocholine**

**Type:** Phospholipids.  $C_{24}H_{50}NO_6P$  **Source:** Sponge *Spirastrella abata* (Korean waters). **Pharm:** Cholesterol biosynthesis inhibitor. **Ref:** B. A. Shin, et al, JNP, 1999, 62, 1554 | N. Alam, et al, JNP, 2001, 64, 533

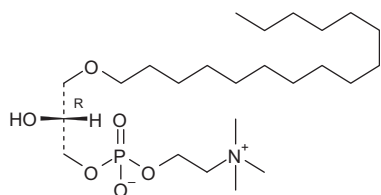


**678 1-(4Z-Hexadecenyl)glycero-3-phosphocholine**

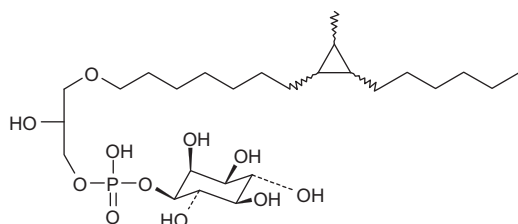
Type: Phospholipids.  $C_{24}H_{50}NO_6P$  Source: Sponge *Spirastrella abata* (Korean waters). Pharm: Cholesterol biosynthesis inhibitor. Ref: B. A. Shin, et al, JNP, 1999, 62, 1554 | N. Alam, et al, JNP, 2001, 64, 533

**679 1-Hexadecylglycero-3-phosphocholine**

Type: Phospholipids.  $C_{24}H_{52}NO_6P$  Powder, mp 250 °C (dec),  $[\alpha]_D^{25} = -6.09^\circ$  ( $c = 1.04$ ,  $CHCl_3/MeOH$ ). Source: Sponges *Spirastrella abata* and *Crella incrustans* (Australia), hydroid *Solanderia secunda*. Pharm: Antifoulant (ascidian *Clavelina moluccensis* larvae); inhibits ascidian, barnacle, bryozoan and algal settling. Ref: N. Fusetani, et al, Comp. Biochem. Physiol., B: Comp. Biochem., 1986, 83, 511 | A. J. Butler, et al, J. Chem. Ecol., 1996, 22, 2041 | B. A. Shin, et al, JNP, 1999, 62, 1554 | N. Alam, et al, JNP, 2001, 64, 533

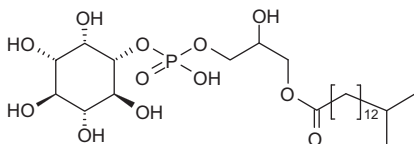
**680 1-[7-(2-Hexyl-3-methylcyclopropyl)heptyl]lysoplasmaynositol**

Lysoplasmaynositol 1 Type: Phospholipids.  $C_{26}H_{51}O_{11}P$  Solid,  $[\alpha]_D^{20} = -10^\circ$  ( $c = 0.03$ , MeOH). Source: Lithistid sponge *Theonella swinhoei* (off Hachijo-jima Island, Japan). Pharm: Antimicrobial. Ref: S. Matsunaga, et al, JNP, 2001, 64, 816 | P. L. Winder, et al, Mar. Drugs, 2011, 9, 2644 (rev)

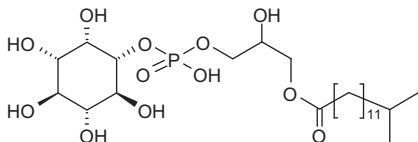


**681 Lysophosphatidyl inositol JMB99-709A**

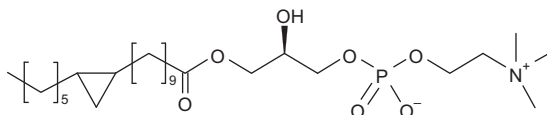
**Type:** Phospholipids.  $C_{25}H_{49}O_{12}P$  **Source:** Marine-derived streptomycete *Streptomyces* sp. M428 (from marine sediment). **Pharm:** Antifungal. **Ref:** K. W. Cho, et al, J. Microbiol. Biotechnol., 1999, 9, 709

**682 Lysophosphatidyl inositol JMB99-709B**

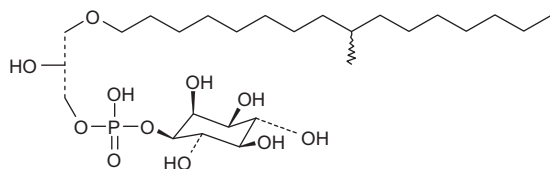
**Type:** Phospholipids.  $C_{24}H_{47}O_{12}P$  **Source:** Marine-derived streptomycete *Streptomyces* sp. M428 (from marine sediment). **Pharm:** Antifungal. **Ref:** K. W. Cho, et al, J. Microbiol. Biotechnol., 1999, 9, 709

**683 1-O-(cis-11',12'-Methylene)-octadecanoylglycero-3-phosphocholine**

**Type:** Phospholipids.  $C_{27}H_{54}NO_7P$  Amorph. solid. **Source:** Sponge *Spirastrella abata* (Korea waters). **Pharm:** Cholesterol biosynthesis inhibitor ( $IC_{50} = 60 \mu\text{g/mL}$ ). **Ref:** B. A. Shin, et al, JNP, 1999, 62, 1554

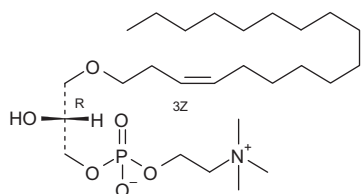
**684 1-(9-Methylhexadecyl)lysoplasmalinositol**

Lysoplasmalinositol 2 **Type:** Phospholipids.  $C_{26}H_{53}O_{11}P$  Solid,  $[\alpha]_D^{20} = -8.9^\circ$  ( $c = 0.03$ , MeOH). **Source:** Lithistid sponge *Theonella swinhoei* (off Hachijo-jima Island, Japan). **Pharm:** Antibacterial (*Escherichia coli*, 50  $\mu\text{g/disk}$ , IZD = 12 mm). **Ref:** S. Matsunaga, et al, JNP, 2001, 64, 816 | P. L. Winder, et al, Mar. Drugs, 2011, 9, 2644 (rev)



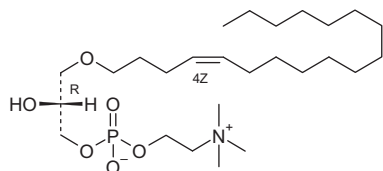
### 685 1-O-(3'-Z-Octadecenyl)glycero-3-phosphocholine

**Type:** Phospholipids.  $C_{26}H_{54}NO_6P$  Amorph. solid. **Source:** Sponge *Spirastrella abata* (Korea waters). **Pharm:** Cholesterol biosynthesis inhibitor ( $IC_{50} = 174 \mu\text{g/mL}$ ). **Ref:** B. A. Shin, et al, JNP, 1999, 62, 1554 | N. Alam, et al, JNP, 2001, 64, 533



### 686 1-O-(4'-Z-Octadecenyl)glycero-3-phosphocholine

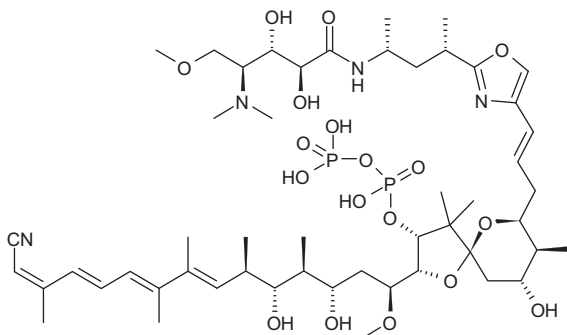
**Type:** Phospholipids.  $C_{26}H_{54}NO_6P$  Amorph. solid. **Source:** Sponge *Spirastrella abata* (Korea waters). **Pharm:** Cholesterol biosynthesis inhibitor ( $IC_{50} = 121 \mu\text{g/mL}$ ). **Ref:** B. A. Shin, et al, JNP, 1999, 62, 1554 | N. Alam, et al, JNP, 2001, 64, 533



### 687 Phosphocalyculin C

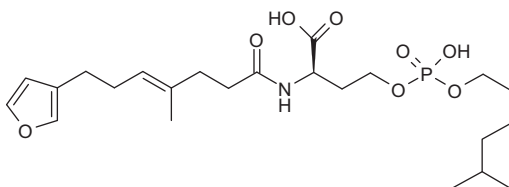
**Type:** Phospholipids.  $C_{51}H_{84}N_4O_{18}P_2$  **Source:** Lithistid sponge *Discodermia calyx*, **Pharm:** Cytotoxic ( $P_{388}$ , although potent,  $IC_{50} = 36 \text{ nmol/L}$ , 5000 times less toxic than calyculin C). **Ref:** Y. Egami, et al, Bioorg. Med. Chem. Lett., 2014, 24, 5150





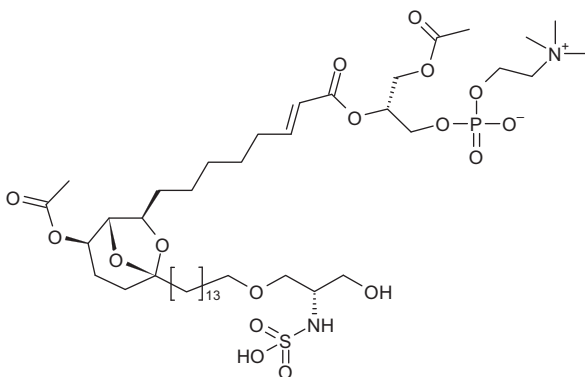
### 688 Pokepola ester

**Type:** Phospholipids.  $C_{23}H_{38}NO_8P$  Oil,  $[\alpha]_D = -4.5^\circ$  ( $c = 0.5$ , MeOH). **Source:** Sponge *Spongia oceania* (Maul, Hawaiian Is.). **Pharm:** Anti-HIV. **Ref:** R. S. Kalidindi, et al, Tet. Lett., 1994, 35, 5579



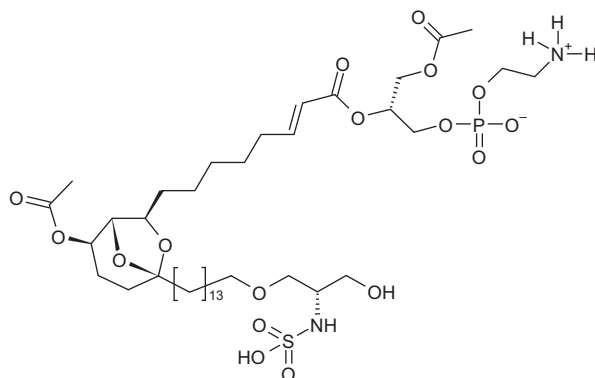
### 689 Siladenoserinol A

**Type:** Phospholipids.  $C_{43}H_{79}N_2O_{17}PS$  **Source:** An unidentified ascidian (family Didemnidae, North Sulawesi, Indonesia). **Pharm:** Inhibits interaction of tumour suppressor p53 with Hdm2 (potentially leading to reactivation of p53 and induction of apoptosis in cancer cells). **Ref:** Y. Nakamura, et al, Org. Lett., 2013, 15, 322

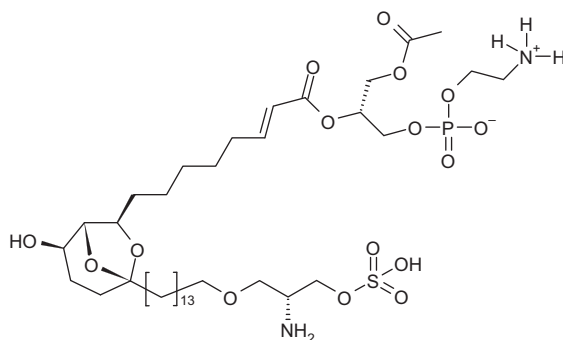


**690 Siladenoserinol B**

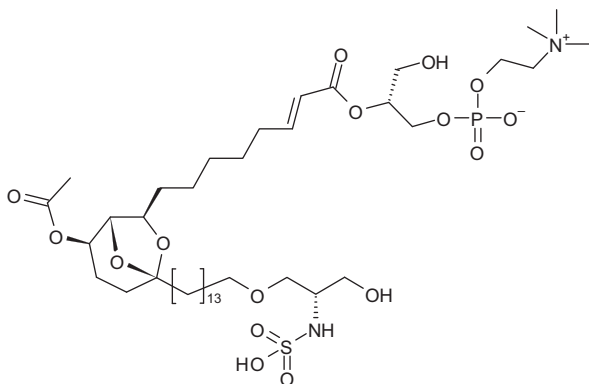
**Type:** Phospholipids.  $C_{40}H_{73}N_2O_{17}PS$  **Source:** An unidentified ascidian (family Didemnidae, North Sulawesi, Indonesia). **Pharm:** Inhibits interaction of tumour suppressor p53 with Hdm2 (potentially leading to reactivation of p53 and induction of apoptosis in cancer cells). **Ref:** Y. Nakamura, et al, Org. Lett., 2013, 15, 322

**691 Siladenoserinol C**

**Type:** Phospholipids.  $C_{38}H_{71}N_2O_{16}PS$  **Source:** An unidentified ascidian (family Didemnidae, North Sulawesi, Indonesia). **Pharm:** Inhibits interaction of tumour suppressor p53 with Hdm2 (potentially leading to reactivation of p53 and induction of apoptosis in cancer cells). **Ref:** Y. Nakamura, et al, Org. Lett., 2013, 15, 322

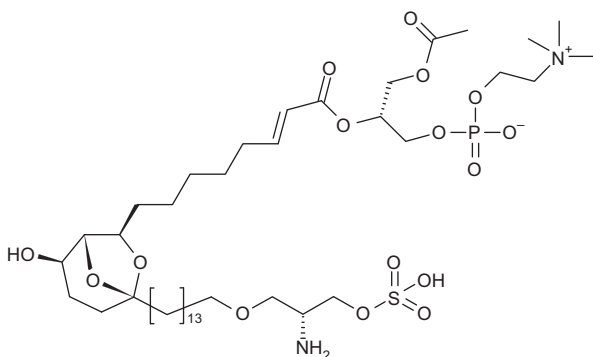
**692 Siladenoserinol D**

**Type:** Phospholipids.  $C_{41}H_{77}N_2O_{16}PS$  **Source:** An unidentified ascidian (family Didemnidae, North Sulawesi, Indonesia). **Pharm:** Inhibits interaction of tumour suppressor p53 with Hdm2 (potentially leading to reactivation of p53 and induction of apoptosis in cancer cells). **Ref:** Y. Nakamura, et al, Org. Lett., 2013, 15, 322



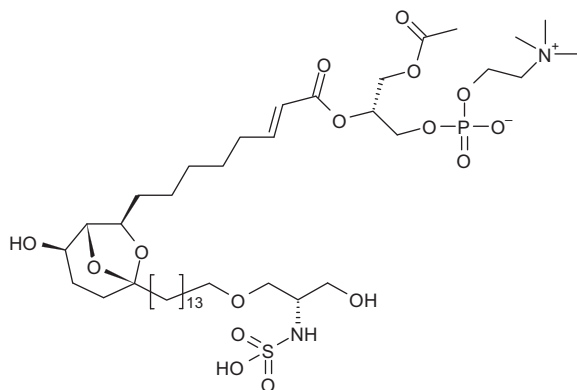
### 693 Siladenoserinol E

**Type:** Phospholipids.  $C_{41}H_{77}N_2O_{16}PS$  **Source:** An unidentified ascidian (family Didemnidae, North Sulawesi, Indonesia). **Pharm:** Inhibits interaction of tumour suppressor p53 with Hdm2 (potentially leading to reactivation of p53 and induction of apoptosis in cancer cells). **Ref:** Y. Nakamura, et al, *Org. Lett.*, 2013, 15, 322



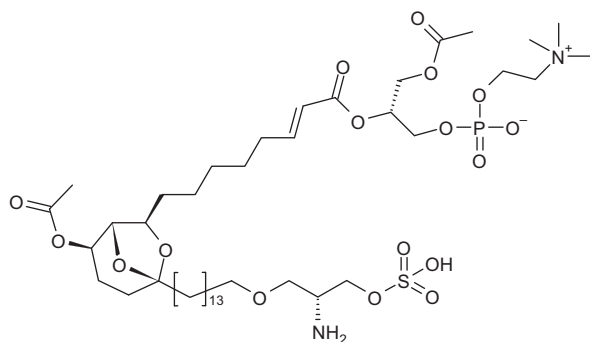
### 694 Siladenoserinol F

**Type:** Phospholipids.  $C_{41}H_{77}N_2O_{16}PS$  **Source:** An unidentified ascidian (family Didemnidae, North Sulawesi, Indonesia). **Pharm:** Inhibits interaction of tumour suppressor p53 with Hdm2 (potentially leading to reactivation of p53 and induction of apoptosis in cancer cells). **Ref:** Y. Nakamura, et al, *Org. Lett.*, 2013, 15, 322



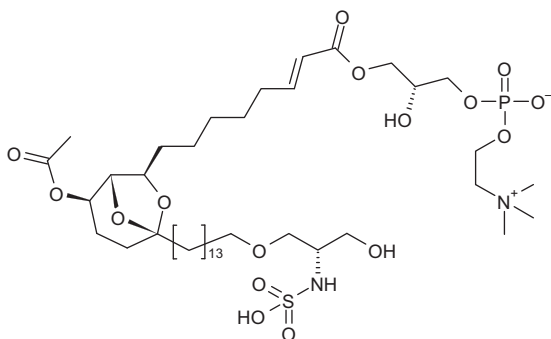
### 695 Siladenoserinol G

**Type:** Phospholipids.  $C_{43}H_{79}N_2O_{17}PS$  **Source:** An unidentified ascidian (family Didemnidae, North Sulawesi, Indonesia). **Pharm:** Inhibits interaction of tumour suppressor p53 with Hdm2 (potentially leading to reactivation of p53 and induction of apoptosis in cancer cells). **Ref:** Y. Nakamura, et al, *Org. Lett.*, 2013, 15, 322



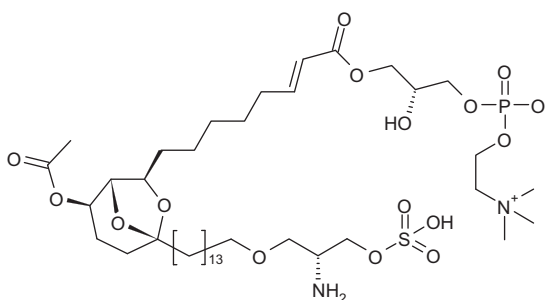
### 696 Siladenoserinol H

**Type:** Phospholipids.  $C_{41}H_{77}N_2O_{16}PS$  **Source:** An unidentified ascidian (family Didemnidae, North Sulawesi, Indonesia). **Pharm:** Inhibits interaction of tumour suppressor p53 with Hdm2 (potentially leading to reactivation of p53 and induction of apoptosis in cancer cells). **Ref:** Y. Nakamura, et al, *Org. Lett.*, 2013, 15, 322



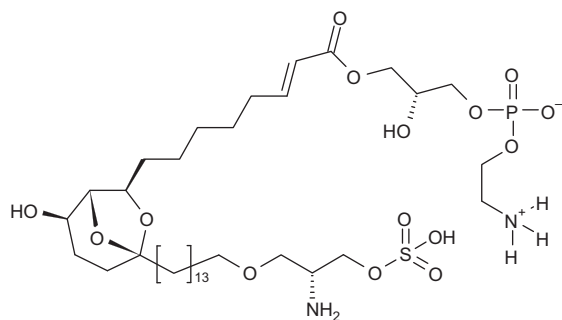
### 697 Siladenoserinol I

**Type:** Phospholipids.  $C_{41}H_{77}N_2O_{16}PS$  **Source:** An unidentified ascidian (family Didemnidae, North Sulawesi, Indonesia). **Pharm:** Inhibits interaction of tumour suppressor p53 with Hdm2 (potentially leading to reactivation of p53 and induction of apoptosis in cancer cells). **Ref:** Y. Nakamura, et al, *Org. Lett.*, 2013, 15, 322



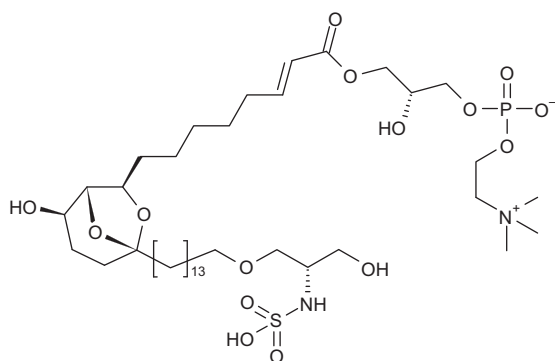
### 698 Siladenoserinol J

**Type:** Phospholipids.  $C_{36}H_{69}N_2O_{15}PS$  **Source:** An unidentified ascidian (family Didemnidae, North Sulawesi, Indonesia). **Pharm:** Inhibits interaction of tumour suppressor p53 with Hdm2 (potentially leading to reactivation of p53 and induction of apoptosis in cancer cells). **Ref:** Y. Nakamura, et al, *Org. Lett.*, 2013, 15, 322



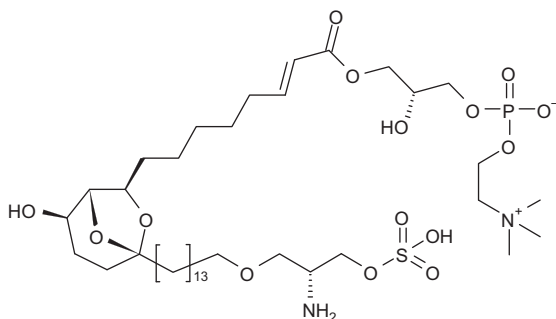
### 699 Siladenoserinol K

**Type:** Phospholipids.  $C_{39}H_{75}N_2O_{15}PS$  **Source:** An unidentified ascidian (family Didemnidae, North Sulawesi, Indonesia). **Pharm:** Inhibits interaction of tumour suppressor p53 with Hdm2 (potentially leading to reactivation of p53 and induction of apoptosis in cancer cells). **Ref:** Y. Nakamura, et al, *Org. Lett.*, 2013, 15, 322



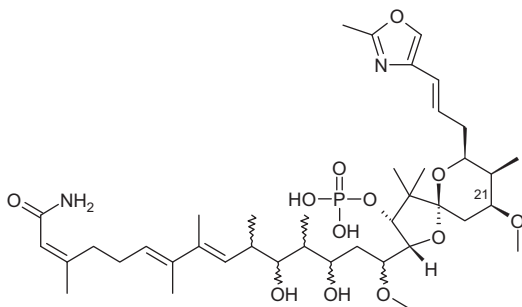
### 700 Siladenoserinol L

**Type:** Phospholipids.  $C_{39}H_{75}N_2O_{15}PS$  **Source:** An unidentified ascidian (family Didemnidae, North Sulawesi, Indonesia). **Pharm:** Inhibits interaction of tumour suppressor p53 with Hdm2 (potentially leading to reactivation of p53 and induction of apoptosis in cancer cells). **Ref:** Y. Nakamura, et al, *Org. Lett.*, 2013, 15, 322



### 701 Swinhoeiamide A

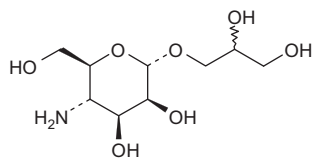
**Type:** Phospholipids.  $C_{40}H_{65}N_2O_{12}P$  Powder,  $[\alpha]_D^{20} = -21.6^\circ$  ( $c = 0.35$ , EtOH). **Source:** Lithistid sponge *Theonella swinhoei* (coast of Karkar I., Papua New Guinea). **Pharm:** Insecticide (neonate larvae of insect *Spodoptera littoralis*, chronic feeding bioassay,  $ED_{50} = 2.11$  ppm,  $LD_{50} = 2.98$  ppm); antifungal (yeast *Candida albicans*, MIC = 1.2  $\mu\text{g}/\text{mL}$ ; *Aspergillus fumigatus*, MIC = 1.0  $\mu\text{g}/\text{mL}$ ); cytotoxic (dose-dependent, various undisclosed cell lines and tissues,  $IC_{50} = 20\text{--}90$  ng/mL, cell proliferation inhibitor). **Ref:** K. G. Steube, et al, *Anticancer Res.*, 1998, 18, 129 | R. A. Edrada, et al, *JNP*, 2002, 65, 1168 | P. L. Winder, et al, *Mar. Drugs*, 2011, 9, 2644 (rev)



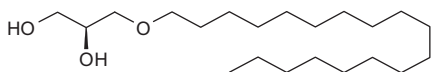
## 1.12 Glycolipids

### 702 1-O-(4-Amino-4-deoxy- $\alpha$ -D-mannopyranosyl)glycerol

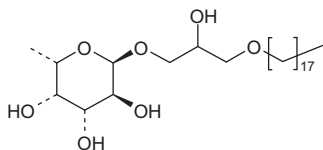
**Type:** Glycolipids.  $C_9H_{19}NO_7$  **Source:** Red alga *Caloglossa leprieurii*. **Pharm:** Anthelmintic. **Ref:** X. -H. et al, *Acta Sci. Nat. Univ. Sunyatseni*, 1997, 36, 1 17

**703 Batilol**

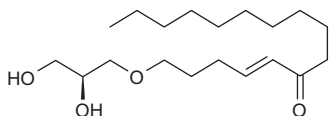
3-(Octadecyloxy)-1,2-propanediol Type: Glycolipids.  $C_{21}H_{44}O_3$  mp 70.5–71.5 °C. Source: Sponges *Desmapsamma anchorata* and *Mycale mytilorum*, zoanthid *Palythoa liscia*, soft coral *Sinularia* sp., gorgonian *Plexaura flexuosa*, shark liver oils. Pharm: Radioprotective; LD<sub>50</sub> (mus, ipr) = 750 mg/kg. Ref: G. Bala Show Reddy, et al, BoMC, 2000, 8, 27

**704 Batyl alcohol-3-O- $\alpha$ -L-fucopyranoside**

Type: Glycolipids.  $C_{27}H_{54}O_7$  Prisms (MeOH), mp 135–138 °C,  $[\alpha]_D^{30} = -73^\circ$  ( $c = 0.1$ , MeOH). Source: Soft coral *Sinularia* sp. (Rangat I., India). Pharm: Antibacterial (*Bacillus pumilis*, 500  $\mu\text{g/mL}$ ). Ref: C. Subrahmanyam, et al, Indi. J. Chem., Sect B, 1999, 38, 1388

**705 Ceratodictyol A**

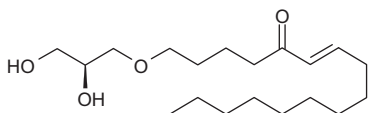
Type: Glycolipids.  $C_{19}H_{36}O_4$  Oil,  $[\alpha]_D^{23} = -33^\circ$  ( $c = 0.01$ , MeOH). Source: Red alga *Ceratodictyon spongiosum* and sponge *Haliclona cymaeformis* (assemblage). Pharm: Cytotoxic (HeLa, IC<sub>50</sub> = 67  $\mu\text{mol/L}$ ). Ref: T. Akiyama, et al, JNP, 2009, 72, 1552

**706 Ceratodictyol B**

Type: Glycolipids.  $C_{19}H_{36}O_4$  Oil,  $[\alpha]_D^{23} = -27^\circ$  ( $c = 0.02$ , MeOH). Source: Red alga *Ceratodictyon spongiosum* and sponge *Haliclona cymaeformis* (assemblage).

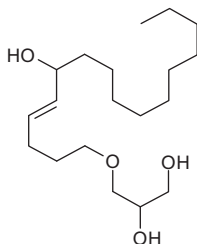


**Pharm:** Cytotoxic (HeLa,  $IC_{50} = 67 \mu\text{mol/L}$ ). **Ref:** T. Akiyama, et al, JNP, 2009, 72, 1552



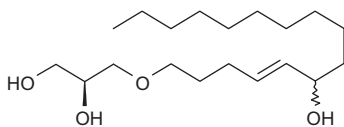
### 707 Ceratodictyol C

**Type:** Glycolipids.  $C_{19}H_{38}O_4$  Epimeric mixture with Ceratodictyol D, oil,  $[\alpha]_D^{24} = -27^\circ$  ( $c = 0.01$ , MeOH). **Source:** Red alga *Ceratodictyon spongiosum* and sponge *Haliclona cymaeformis* (assemblage). **Pharm:** Cytotoxic (mixture with Ceratodictyol D, HeLa,  $IC_{50} = 67 \mu\text{mol/L}$ ). **Ref:** T. Akiyama, et al, JNP, 2009, 72, 1552



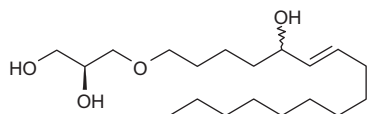
### 708 Ceratodictyol D

Ceratodictyol C 6'-epimer **Type:** Glycolipids.  $C_{19}H_{38}O_4$  Epimeric mixture with Ceratodictyol C, oil,  $[\alpha]_D^{24} = -27^\circ$  ( $c = 0.01$ , MeOH). **Source:** Red alga *Ceratodictyon spongiosum* and sponge *Haliclona cymaeformis* (assemblage). **Pharm:** Cytotoxic (mixture with Ceratodictyol C, HeLa,  $IC_{50} = 67 \mu\text{mol/L}$ ). **Ref:** T. Akiyama, et al, JNP, 2009, 72, 1552



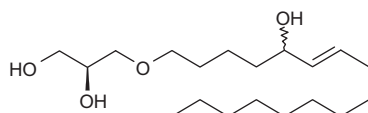
### 709 Ceratodictyol E

**Type:** Glycolipids.  $C_{19}H_{38}O_4$  Epimeric mixture with Ceratodictyol F, oil,  $[\alpha]_D^{24} = -26^\circ$  ( $c = 0.01$ , MeOH). **Source:** Red alga *Ceratodictyon spongiosum* and sponge *Haliclona cymaeformis* (assemblage). **Pharm:** Cytotoxic (mixture with Ceratodictyol F, HeLa,  $IC_{50} = 67 \mu\text{mol/L}$ ). **Ref:** T. Akiyama, et al, JNP, 2009, 72, 1552



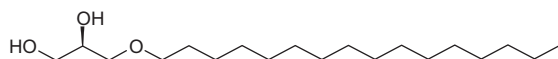
### 710 Ceratodictyol F

**Type:** Glycolipids.  $C_{19}H_{38}O_4$  Epimeric mixture with Ceratodictyol E, oil,  $[\alpha]_D^{24} = -26^\circ$  ( $c = 0.01$ , MeOH). **Source:** Red alga *Ceratodictyon spongiosum* and sponge *Haliclona cymaeiformis* (assemblage). **Pharm:** Cytotoxic (mixture with Ceratodictyol E, HeLa,  $IC_{50} = 67 \mu\text{mol/L}$ ). **Ref:** T. Akiyama, et al, JNP, 2009, 72, 1552



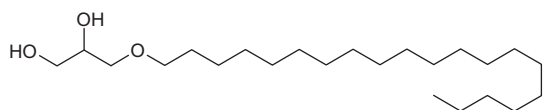
### 711 (R)-Chimyl alcohol

**Type:** Glycolipids.  $C_{19}H_{40}O_3$  mp  $64.5\text{--}65.5^\circ\text{C}$ . **Source:** Nudibranch *Tritoniella belli* (Antarctic) and stolonifer *Clavularia frankliniana* (co-occurring). **Pharm:** Antifeedant (omnivorous starfish *Odontaster validus*). **Ref:** J. B. McClintock, et al, J. Chem. Ecol., 1994, 20, 3361



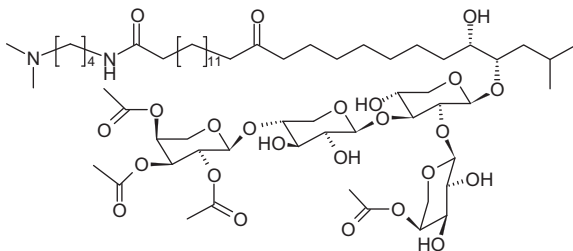
### 712 3-Eicosyloxy-1,2-propanediol

**Type:** Glycolipids.  $C_{23}H_{48}O_3$  **Source:** Nudibranch *Tritoniella belli* (Antarctic) and stolonifer *Clavularia frankliniana* (co-occurring). **Pharm:** Antifeedant (omnivorous starfish *Odontaster validus*). **Ref:** J. B. McClintock, et al, J. Chem. Ecol., 1994, 20, 3361



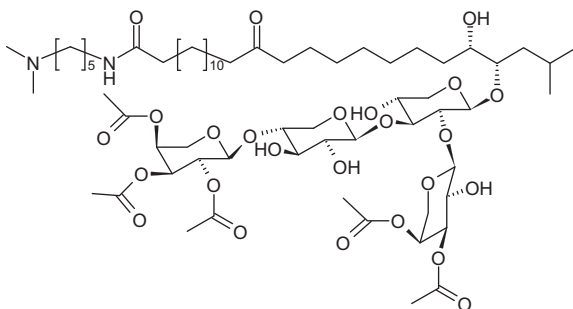
### 713 Erylusamine B

**Type:** Glycolipids.  $C_{62}H_{108}N_2O_{24}$  Gum,  $[\alpha]_D^{20} = -5.5^\circ$  ( $c = 0.2$ , MeOH). **Source:** Sponge *Erylus placenta* (Japan waters). **Pharm:** IL-6 receptor antagonist (inhibits binding of IL-6 to its receptor,  $IC_{50} = 66 \mu\text{g/mL}$ ); cytokinin. **Ref:** N. Fusetani, et al, Tet. Lett., 1993, 34, 4067 | N. Sata, et al, Tetrahedron, 1994, 50, 1105



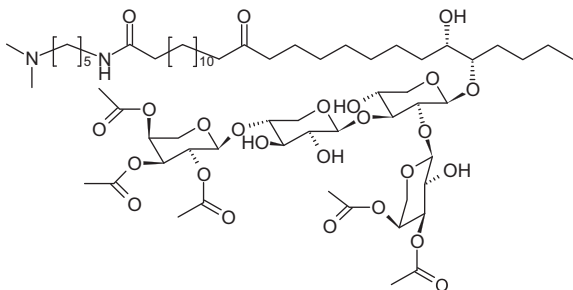
### 714 Erylusamine C

**Type:** Glycolipids.  $C_{64}H_{110}N_2O_{25}$  Colorless oil,  $[\alpha]_D^{20} = -9.6^\circ$  ( $c = 0.3$ , MeOH). **Source:** Sponge *Erylus placenta* (Japan waters). **Pharm:** IL-6 receptor antagonist (inhibits binding of IL-6 to its receptor,  $IC_{50} = 33 \mu\text{g/mL}$ ). **Ref:** N. Sata, et al, Tetrahedron, 1994, 50, 1105



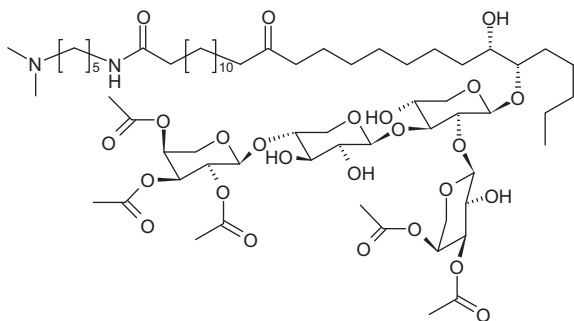
### 715 Erylusamine D

**Type:** Glycolipids.  $C_{64}H_{110}N_2O_{25}$  Colorless oil,  $[\alpha]_D^{20} = -6.0^\circ$  ( $c = 0.1$ , MeOH). **Source:** Sponge *Erylus placenta* (Japan waters). **Pharm:** IL-6 receptor antagonist (inhibits binding of IL-6 to its receptor,  $IC_{50} = 37 \mu\text{g/mL}$ ). **Ref:** N. Sata, et al, Tetrahedron, 1994, 50, 1105

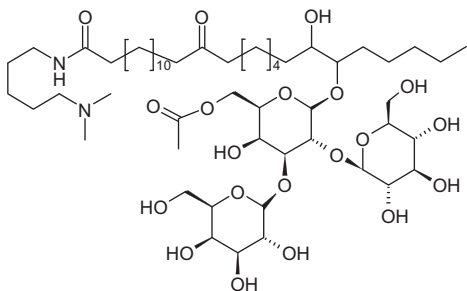


**716 Erylusamine E**

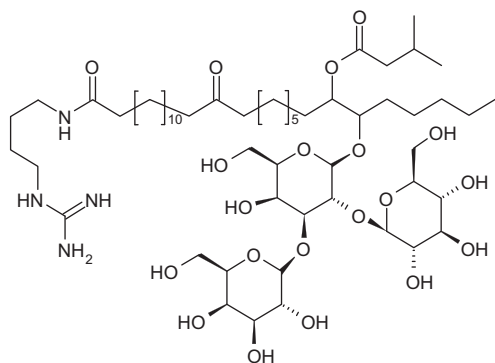
**Type:** Glycolipids.  $C_{65}H_{112}N_2O_{25}$  Colorless oil,  $[\alpha]_D^{20} = -8.0^\circ$  ( $c = 0.2$ , MeOH). **Source:** Sponge *Erylus placenta* (Japan waters). **Pharm:** IL-6 receptor antagonist (inhibits binding of IL-6 to its receptor,  $IC_{50} = 17 \mu\text{g/mL}$ ). **Ref:** N. Sata, et al, Tetrahedron, 1994, 50, 1105

**717 Erylusamine TA**

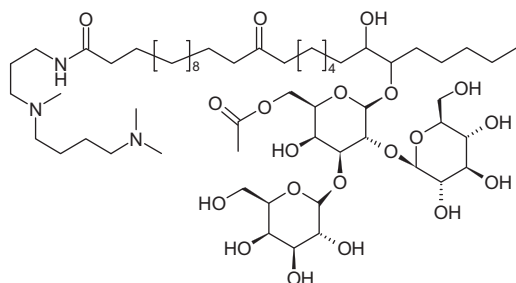
**Type:** Glycolipids.  $C_{54}H_{100}N_2O_{20}$  Oil,  $[\alpha]_D^{25} = +28^\circ$  ( $c = 2.9$ , MeOH). **Source:** Sponge *Erylus cf. lendenfeldi* (Red Sea). **Pharm:** Cytotoxic. **Ref:** R. Goobes, et al, Tetrahehron, 1996, 52, 7921

**718 Erylusidine**

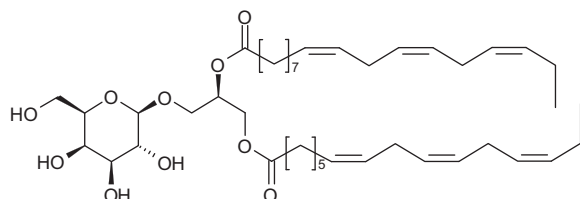
**Type:** Glycolipids.  $C_{56}H_{104}N_4O_{20}$  Oil,  $[\alpha]_D^{25} = -4.1^\circ$  ( $c = 4.7$ , MeOH). **Source:** Sponge *Erylus cf. lendenfeldi* (Red Sea). **Pharm:** Cytotoxic. **Ref:** R. Goobes, et al, Tetrahehron, 1996, 52, 7921

**719 Erylusine**

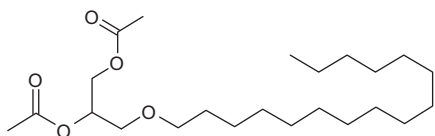
**Type:** Glycolipids.  $C_{57}H_{107}N_3O_{20}$  Oil,  $[\alpha]_D^{25} = +1.9^\circ$  ( $c = 4.3$ , MeOH). **Source:** Sponge *Erylus cf. lendenfeldi* (Red Sea). **Pharm:** Cytotoxic. **Ref:** R. Goobes, et al, Tetrahebron, 1996, 52, 7921

**720 Glycerol-1-(7Z,10Z,13Z-hexadecatrienoate), 2-(9Z,12Z,15Z-octadecatrienoate)-2(R)-3-O-β-D-Galactopyranoside**

**Type:** Glycolipids.  $C_{43}H_{70}O_{10}$  Oil,  $[\alpha]_D^{25} = -2.8^\circ$  ( $c = 0.2$ ,  $CHCl_3$ ). **Source:** Green alga *Caulerpa taxifolia* (Mediterranean Sea). **Pharm:** Cytotoxic. **Ref:** I. Mancini, et al, Helv. Chim. Acta, 1998, 81, 1681

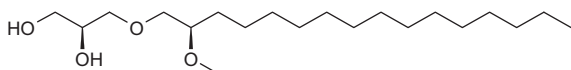
**721 Glycerol 1-hexadecyl ether diacetate**

**Type:** Glycolipids.  $C_{23}H_{44}O_5$   $[\alpha]_D^{20} = -12.8^\circ$  ( $c = 0.2$ , hexane). **Source:** Sea hare *Aplysia kurodai*. **Pharm:** Laxative. **Ref:** T. Miyamoto, et al, Annalen, 1988, 585



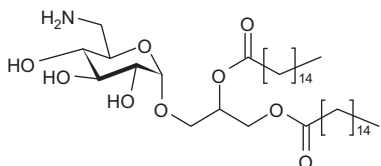
### 722 Glycerol 1-(2*R*-methoxyhexadecyl) ether

**Type:** Glycolipids.  $C_{20}H_{42}O_4$  mp 39.5 °C, mp 44.2–44.7 °C (dimorph.),  $[\alpha]_D^{20} = -3.3^\circ$  ( $c = 5$ , THF). **Source:** Brachiopod olecranon-mussel *Gryphus vitreus*, shark liver oil. **Pharm:** Cytotoxic. **Ref:** M. D'Ambrosio, et al, *Experientia*, 1996, 52, 624



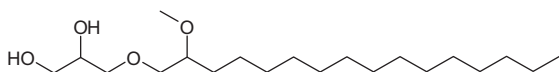
### 723 Ishigoside

**Type:** Glycolipids.  $C_{41}H_{79}NO_9$  **Source:** Brown alga *Ishige okamurae* (Busan, R. O. Korea). **Pharm:** Antioxidant (free-radical scavenger, evaluated by ESR technique). **Ref:** Y. Zou, et al, *Biotechnol. Bioprocess Eng.*, 2009, 14, 20



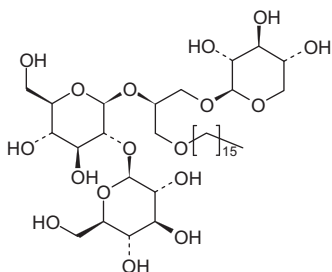
### 724 1-*O*-(2-Methoxyhexadecyl)glycerol

**Type:** Glycolipids.  $C_{20}H_{42}O_4$  **Source:** Nudibranch *Tritoniella belli* (Antarctic) and stolonifer *Clavularia frankliniana* (co-occurring). **Pharm:** Antifeedant (omnivorous starfish *Odontaster validus*). **Ref:** J. B. McClintock, et al, *J. Chem. Ecol.*, 1994, 20, 3361



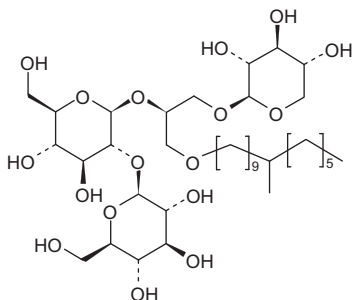
### 725 Myrmekioside A

**Type:** Glycolipids.  $C_{36}H_{68}O_{17}$  Amorph. solid,  $[\alpha]_D = -19.8^\circ$  ( $c = 0.50$ , MeOH). **Source:** Sponge *Myrmekioderma* sp. (Japan waters). **Pharm:** Reverses phenotype of melanoma H-ras transformed NIH3T3 cells (5  $\mu\text{g/mL}$ ). **Ref:** S. Aoki, et al, *Tetrahedron*, 1999, 55, 14865



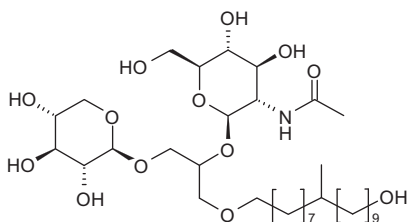
### 726 Myrmekioside B

**Type:** Glycolipids.  $C_{37}H_{70}O_{17}$  Amorph. solid,  $[\alpha]_D = -19.5^\circ$  ( $c = 0.50$ , MeOH). **Source:** Sponge *Myrmekioderma* sp. (Japan waters). **Pharm:** Reverses phenotype of melanoma H-ras transformed NIH3T3 cells (5  $\mu\text{g}/\text{mL}$ ). **Ref:** S. Aoki, et al, Tetrahedron, 1999, 55, 14865



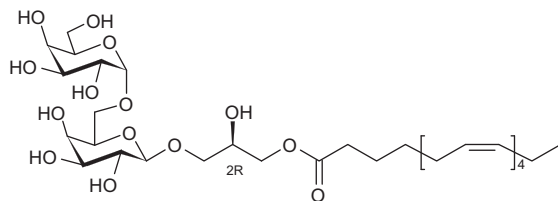
### 727 Myrmekioside E

**Type:** Glycolipids.  $C_{35}H_{67}NO_{13}$  **Source:** Sponge *Myrmekioderma dendyi* (Epi I., Vanuatu). **Pharm:** Cytotoxic (lung tumour cells, moderate). **Ref:** F. Farokhi, et al, Eur. J. Med. Chem., 2012, 49, 406



### 728 Sarcoglycoside A

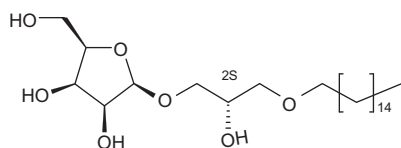
**Type:** Glycolipids.  $C_{33}H_{54}O_{14}$  Amorph. powder,  $[\alpha]_D^{22} = +20.8^\circ$  ( $c = 0.3$ , MeOH). **Source:** Soft coral *Sarcophyton infundibuliforme* (South China waters Sea). **Pharm:** Toxic (*Artemia salina*). **Ref:** L. Li, et al, Helv. Chim. Acta, 2009, 92, 1495



### 729 Sarcoglycoside B

**Type:** Glycolipids.  $C_{24}H_{48}O_7$  Amorph. powder,  $[\alpha]_D^{25} = -41.2^\circ$  ( $c = 0.5$ ,  $CHCl_3$ ).

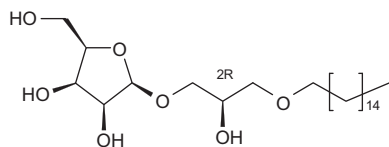
**Source:** Soft coral *Sarcophyton infundibuliforme* (South China waters Sea). **Pharm:** Toxic (*Artemia salina*). **Ref:** L. Li, et al, Helv. Chim. Acta, 2009, 92, 1495



### 730 Sarcoglycoside C

**Type:** Glycolipids.  $C_{24}H_{48}O_7$  Amorph. powder,  $[\alpha]_D^{25} = -58.5^\circ$  ( $c = 0.5$ ,  $CHCl_3$ ).

**Source:** Soft coral *Sarcophyton infundibuliforme* (South China waters Sea). **Pharm:** Toxic (*Artemia salina*). **Ref:** L. Li, et al, Helv. Chim. Acta, 2009, 92, 1495

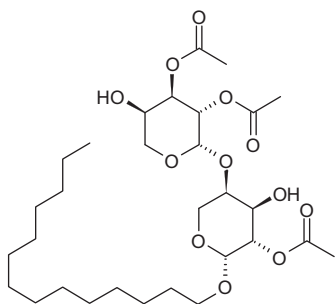


### 731 Sinularioside

**Type:** Glycolipids.  $C_{30}H_{52}O_{12}$  **Source:** Soft coral *Sinularia* sp. (Manado, North Sulawesi, Indonesia). **Pharm:** NO release inhibitor (LPS-stimulated macrophages).

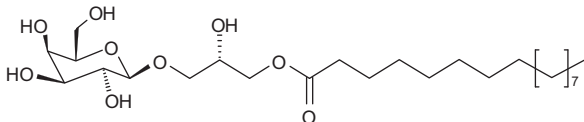
**Ref:** M. Y. Putra, et al, BoMCL, 2012, 22, 2723 | M. Y. Putra, et al, Tet. Lett., 2012, 53, 3937





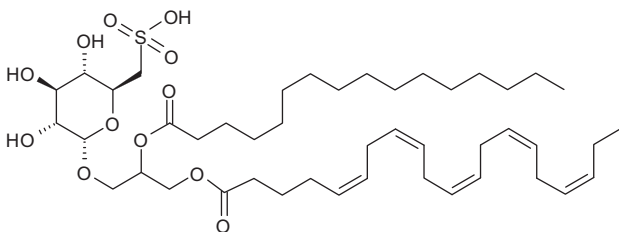
### 732 Spongilipid

**Type:** Glycolipids.  $C_{25}H_{48}O_9$  Amorph. powder, mp 119–121 °C,  $[\alpha]_D^{31} = +9.2^\circ$  ( $c = 0.8$ , MeOH). **Source:** Sponge *Spongia* cf. *hispidus* (Singapore). **Pharm:** Antibacterial (inhibits fecal opportunist *Enterococcus faecalis*, MIC = 25–50  $\mu\text{g}/\text{disk}$ ). **Ref:** G. R. Pettit, et al, Can. J. Chem., 1997, 75, 920



### 733 (6-Sulfoquinovopyranosyl)-(1→3')-1'-(5,8,11,14,17-eicosapentaenyl)-2'-hexadecanoylglycerol

**Type:** Glycolipids.  $C_{45}H_{76}O_{12}S$  Amorph. solid,  $[\alpha]_D = +57^\circ$  ( $c = 0.1$ , MeOH). **Source:** Red alga *Gigartina tenella* (Japan waters). **Pharm:** DNA polymerases inhibitor (eukaryotic); HIV-1 reverse transcriptase I inhibitor. **Ref:** K. Ohta, et al, CPB, 1998, 46, 684

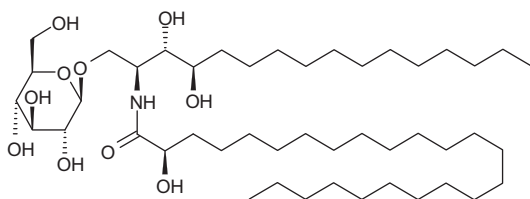


## 1.13 Sphingolipids

### 734 Acanthacerebroside A

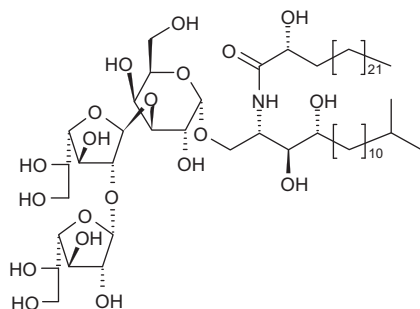
**Type:** Sphingolipids.  $C_{46}H_{91}NO_{10}$  Needles +3H<sub>2</sub>O (MeOH), mp 209–210 °C,  $[\alpha]_D = +2.4^\circ$  ( $c = 0.81$ , propanol). **Source:** Starfish *Acanthaster planci*. **Pharm:** Cytotoxic;

immunostimulant; neurotogenic; cell growth inhibitor. Ref: Y. Kawano, et al, *Annalen*, 1988, 19 | S. Sugiyama, et al, *Annalen*, 1988, 619; 1990, 1063 | R. Higuchi, et al, *Liebigs Ann. Chem.*, 1990, 659 | N. Chida, et al, *Bull. Chem. Soc. Jpn.*, 1998, 71, 259



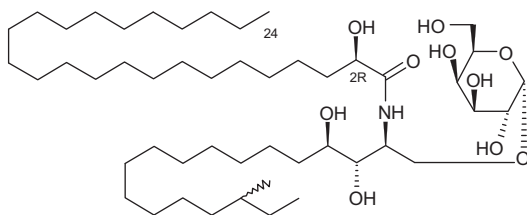
### 735 Agelagalastatin

Type: Sphingolipids.  $C_{60}H_{115}NO_{20}$  Amorph. powder,  $[\alpha]_D = +59^\circ$  ( $c = 0.65$ ,  $CHCl_3$ ) ( $m = 10$  or  $11$ ,  $n = 21$  or  $20$ ). Source: Sponge *Agelas* sp. (Papua New Guinea). Pharm: Cytotoxic (NCI-H460,  $GI_{50} = 0.77 \mu\text{g/mL}$ , OVCAR-3,  $GI_{50} = 2.8 \mu\text{g/mL}$ ). Ref: G. R. Pettit, et al, *Chem. Comm.*, 1999, 915



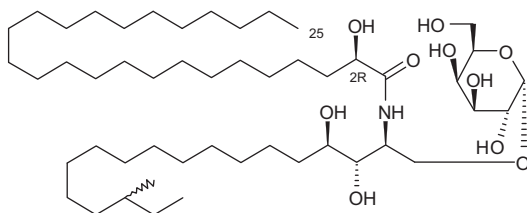
### 736 Agelasphin 11

*N*-(2*R*-Hydroxytetracosanoyl)-(2*S*,3*S*,4*R*,16*ξ*)-2-amino-16-methyl-1,3,4-octadecanetriol 1-*O*- $\alpha$ -*D*-galactopyranoside Type: Sphingolipids.  $C_{49}H_{97}NO_{10}$  mp 189.5–190.5 °C,  $[\alpha]_D^{24} = +51.9^\circ$  ( $c = 1$ , Py). Source: Sponge *Agelas mauritianus* (Okinawa). Pharm: Antineoplastic (*in vivo*, B16,  $T/C = 160\%–190\%$ , high activity); cytotoxic (*in vitro*, B16, 20  $\mu\text{g/mL}$ , weak and no activity); immunostimulant. Ref: T. Natori, et al, *Tet. Lett.*, 1993, 34, 5591 | T. Natori, et al, *Tetrahedron*, 1994, 50, 2771 | Z. Motoki, et al, *BoMCL*, 1995, 5, 705 | E. Kobayashi, et al, *Biol. Pharm. Bull.*, 1996, 19, 350



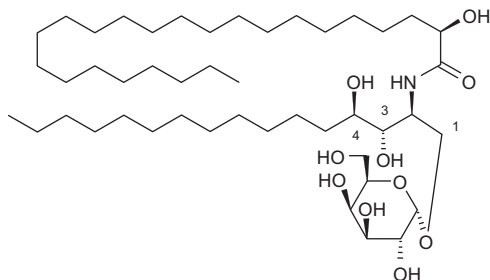
### 737 Agelasphin 13

*N*-(2*R*-Hydroxytetracosanoyl)-(2*S*,3*S*,4*R*,16 $\xi$ )-2-amino-16-methyl-1,3,4-octadecanetriol 1-*O*- $\alpha$ -*D*-galactopyranoside **Type:** Sphingolipids.  $C_{50}H_{99}NO_{10}$  mp 215.5–218.0 °C,  $[\alpha]_D^{24} = +48.8^\circ$  ( $c = 0.5$ , Py). **Source:** Sponge *Agelas mauritanus* (Okinawa). **Pharm:** Antineoplastic (*in vivo*, B16,  $T/C = 160\%$ – $190\%$ , high activity); cytotoxic (*in vitro*, B16, 20  $\mu\text{g/mL}$ , weak and no activity); immunostimulant. **Ref:** T. Natori, et al, Tet. Lett., 1993, 34, 5591 | T. Natori, et al, Tetrahedron, 1994, 50, 2771 | Z. Motoki, et al, BoMCL, 1995, 5, 705



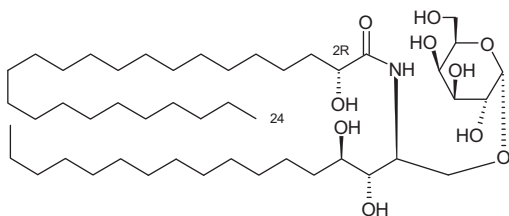
### 738 Agelasphin 7A

*N*-(2*R*-Hydroxytetracosanoyl)-(2*S*,3*S*,4*R*)-2-amino-1,3,4-hexadecanetriol 1-*O*- $\alpha$ -*D*-galactopyranoside **Type:** Sphingolipids.  $C_{46}H_{91}NO_{10}$  mp 193.5–195.0 °C,  $[\alpha]_D^{24} = +52.3^\circ$  ( $c = 0.10$ , Pyridine). **Source:** Sponge *Agelas mauritanus* (Okinawa). **Pharm:** Antineoplastic (*in vivo*, B16,  $T/C = 160\%$ – $190\%$ , high activity); cytotoxic (*in vitro*, B16, 20  $\mu\text{g/mL}$ , weak and no activity). **Ref:** T. Natori, et al, Tet. Lett., 1993, 34, 5591 | T. Natori, et al, Tetrahedron, 1994, 50, 2771

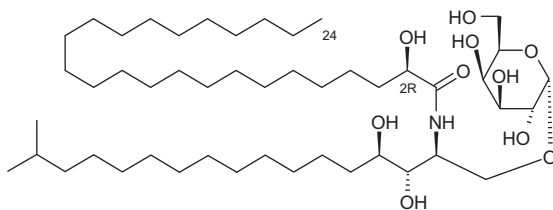


**739 Agelasphin 9A**

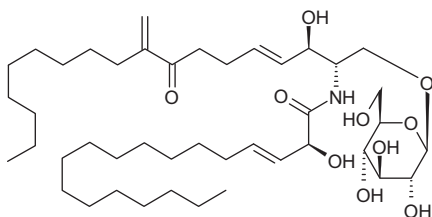
*N*-(2*R*-Hydroxytetracosanoyl)-(2*S*,3*S*,4*R*)-2-amino-1,3,4-heptadecanetriol 1-*O*- $\alpha$ -*D*-galactopyranoside **Type:** Sphingolipids.  $C_{47}H_{93}NO_{10}$  mp 201.0–203.5 °C,  $[\alpha]_D^{24} = +49.9^\circ$  ( $c = 0.10$ , Py). **Source:** Sponge *Agelas mauritianus* (Okinawa). **Pharm:** Antineoplastic (*in vivo*, B16,  $T/C = 160\%$ – $190\%$ , high activity); cytotoxic (*in vitro*, B16, 20  $\mu\text{g/mL}$ , weak and no activity); immunostimulant. **Ref:** T. Natori, et al, Tet. Lett., 1993, 34, 5591 | T. Natori, et al, Tetrahedron, 1994, 50, 2771

**740 Agelasphin 9B**

*N*-(2*R*-Hydroxytetracosanoyl)-(2*S*,3*S*,4*R*)-2-amino-16-methyl-1,3,4-heptadecanetriol 1-*O*- $\alpha$ -*D*-galactopyranoside **Type:** Sphingolipids.  $C_{48}H_{95}NO_{10}$  mp 211.0–212.0 °C,  $[\alpha]_D^{24} = +55.0^\circ$  ( $c = 0.10$ , Py). **Source:** Sponge *Agelas mauritianus* (Okinawa). **Pharm:** Antineoplastic (*in vivo*, B16,  $T/C = 160\%$ – $190\%$ , high activity); cytotoxic (*in vitro*, B16, 20  $\mu\text{g/mL}$ , weak and no activity); immunostimulant. **Ref:** T. Natori, et al, Tet. Lett., 1993, 34, 5591 | K. Akimoto, et al, Tet. Lett., 1993, 34, 5593 | T. Natori, et al, Tetrahedron, 1994, 50, 2771

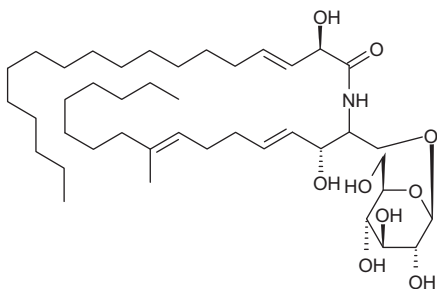
**741 Alternaroside A**

**Type:** Sphingolipids.  $C_{43}H_{77}NO_{10}$  Amorph. powder,  $[\alpha]_D^{20} = -11^\circ$  ( $c = 0.6$ , MeOH). **Source:** Marine-derived fungus *Alternaria raphani* THW-18 (halotolerant, from sediment, Chinese sea salt field). **Pharm:** Antibacterial (*Escherichia coli* and *Bacillus subtilis*, very weak); antifungal (yeast *Candida albicans*, very weak). **Ref:** W. L. Wang, et al, JNP, 2009, 72, 1695

**742 Alternaroside B**

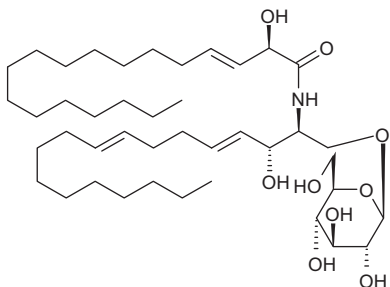
Type: Sphingolipids.  $C_{42}H_{77}NO_9$ , Amorph. powder,  $[\alpha]_D^{20} = -9^\circ$  ( $c = 0.1$ , MeOH).

Source: Marine-derived fungus *Alternaria raphani* THW-18 (halotolerant, from sediment, Chinese sea salt field). Pharm: Antibacterial (*Escherichia coli* and *Bacillus subtilis*, very weak); antifungal (yeast *Candida albicans*, very weak). Ref: W. L. Wang, et al, JNP, 2009, 72, 1695

**743 Alternaroside C**

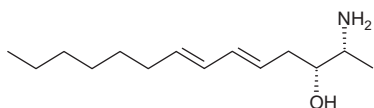
Type: Sphingolipids.  $C_{42}H_{77}NO_9$ , Amorph. powder,  $[\alpha]_D^{20} = -4^\circ$  ( $c = 0.1$ , MeOH).

Source: Marine-derived fungus *Alternaria raphani* THW-18 (halotolerant, from sediment, Chinese sea salt field). Pharm: Antibacterial (*Escherichia coli* and *Bacillus subtilis*, very weak); antifungal (yeast *Candida albicans*, very weak). Ref: W. L. Wang, et al, JNP, 2009, 72, 1695

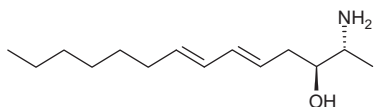


**744 (2*R*,3*R*)-Aminotetradeca-5,7-dien-3-ol**

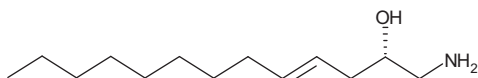
Type: Sphingolipids.  $C_{14}H_{27}NO$  Source: Sponge *Xestospongia* sp. Pharm: Antifungal. Ref: N. K. Gulavita, et al, JOC, 1989, 54, 366 | N. Langlois, et al, Tet. Lett., 2001, 42, 5709 | L. Garrido, et al, Tetrahedron, 2001, 57, 4579

**745 (2*R*,3*S*)-Aminotetradeca-5,7-dien-3-ol**

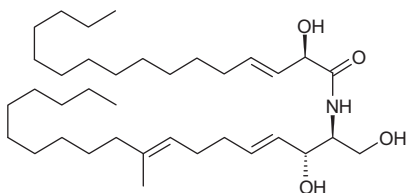
Type: Sphingolipids.  $C_{14}H_{27}NO$  Source: Sponge *Xestospongia* sp. Pharm: Antifungal. Ref: N. K. Gulavita, et al, JOC, 1989, 54, 366 | N. Langlois, et al, Tet. Lett., 2001, 42, 5709 | L. Garrido, et al, Tetrahedron, 2001, 57, 4579

**746 (2*S*,4*E*)-1-Amino-4-tridecen-2-ol**

Type: Sphingolipids.  $C_{13}H_{27}NO$  Source: Ascidian *Pseudodistoma* sp. (South Africa). Pharm: Antimicrobial. Ref: G. J. Hooper, et al, Nat. Prod. Lett., 1995, 6, 31

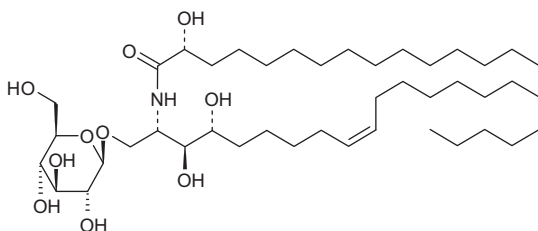
**747 Asperamide A**

Type: Sphingolipids.  $C_{37}H_{69}NO_4$  Amorph. powder, mp 64–66 °C,  $[\alpha]_D = -5.6^\circ$  ( $c = 0.6$ ,  $CHCl_3$ ). Source: Marine-derived fungus *Aspergillus niger* EN-13 from brown alga *Colpomenia sinuosa* (China waters waters). Pharm: Antifungal (*Candida albicans*, moderate). Ref: Y. Zhang, et al, Lipids, 2007, 42, 759

**748 Astrocerebroside A**

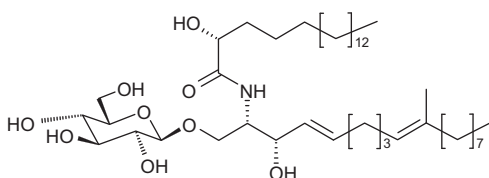
Type: Sphingolipids.  $C_{43}H_{83}NO_{10}$  Needles  $+1H_2O$  (MeOH), mp 189–192 °C,  $[\alpha]_D^{25} = +10.3^\circ$  ( $c = 1$ , 1-propanol). Source: Starfish *Astropecten latespinosus* ( $CHCl_3/MeOH$  extract). Pharm: Cytotoxic; immunostimulant; neuritogenic; cell growth inhibitor. Ref:

Y. Kawano, et al, Liebigs Ann. Chem., 1988, 19 | R. Higuchi, et al, Liebigs Ann. Chem., 1990, 659 | N. Chida, et al, Bull. Chem. Soc. Jpn., 1998, 71, 259



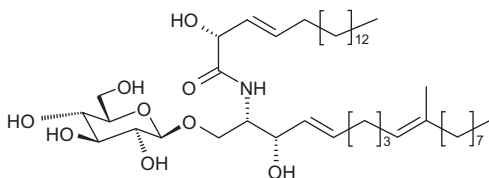
### 749 Avuside A

Flavuside A Type: Sphingolipids.  $C_{43}H_{81}NO_9$ , Source: Marine-derived fungus *Aspergillus flavus* from green alga *Codium fragile* (GeoMun I., Yeosu, R. O. Korea). Pharm: Antibacterial (*Staphylococcus aureus* and MRSA, weak). Ref: G. Yang, et al, CPB, 2011, 59, 1174



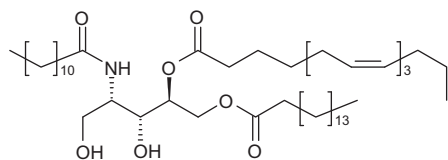
### 750 Avuside B

Flavuside B Type: Sphingolipids.  $C_{43}H_{79}NO_9$ , Source: Marine-derived fungus *Aspergillus flavus* from green alga *Codium fragile* (GeoMun I., Yeosu, R. O. Korea). Pharm: Antibacterial (*Staphylococcus aureus* and MRSA, weak). Ref: G. Yang, et al, CPB, 2011, 59, 1174



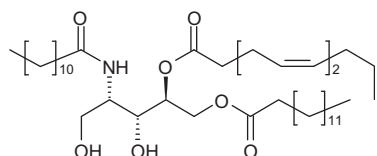
### 751 Bathymodiolamide A

Type: Sphingolipids.  $C_{49}H_{89}NO_7$   $[\alpha]_D^{24} = +10.8^\circ$  ( $c = 0.08$ , MeOH). Source: Mussel *Bathymodiolus thermophilus* (depth of 1700 m, near hydrothermal vents on the Mid-Atlantic Ridge). Pharm: Cytotoxic (apoptosis induction assay, HeLa,  $IC_{50} = 0.4 \mu\text{mol/L}$ ; MCF7,  $IC_{50} = 0.1 \mu\text{mol/L}$ ). Ref: E. H. Andrianasolo, et al, JNP, 2011, 74, 842



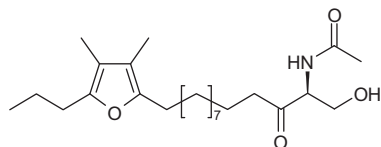
### 752 Bathymodiolamide B

**Type:** Sphingolipids.  $C_{42}H_{77}NO_7$   $[\alpha]_D^{24} = +10.9^\circ$  ( $c = 0.08$ , MeOH). **Source:** Mussel *Bathymodiolus thermophilus* (depth of 1700 m, near hydrothermal vents on the Mid-Atlantic Ridge). **Pharm:** Cytotoxic (apoptosis induction assay, HeLa,  $IC_{50} = 0.5 \mu\text{mol/L}$ ; MCF7,  $IC_{50} = 0.2 \mu\text{mol/L}$ ). **Ref:** E. H. Andrianasolo, et al, JNP, 2011, 74, 842



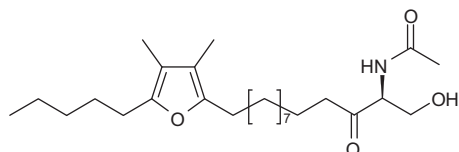
### 753 Calicogorgin A

**Type:** Sphingolipids.  $C_{24}H_{41}NO_4$  Optically active viscous oil,  $[\alpha]_D^{22} = +7.2^\circ$  ( $c = 0.25$ ,  $\text{CHCl}_3$ ). **Source:** Gorgonian *Calicogorgia* sp. (Japan waters). **Pharm:** Toxic (repels prosobranch *Drupella fragum*). **Ref:** M. Ochi, et al, Tet. Lett., 1992, 33, 7531



### 754 Calicogorgin B

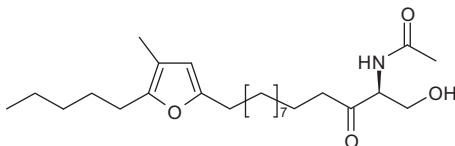
**Type:** Sphingolipids.  $C_{26}H_{45}NO_4$  Colorless oil,  $[\alpha]_D^{21} = +7.6^\circ$  ( $c = 0.05$ ,  $\text{CHCl}_3$ ). **Source:** Gorgonian *Calicogorgia* sp. (Japan waters). Toxic (repels prosobranch *Drupella fragum*). **Ref:** M. Ochi, et al, Tet. Lett., 1992, 33, 7531



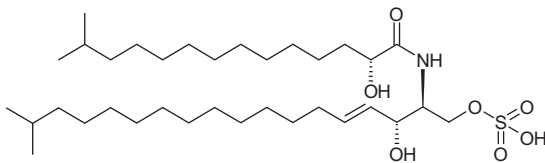


**755 Calicogorgin C**

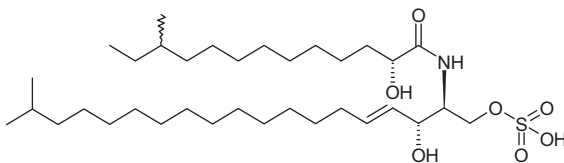
**Type:** Sphingolipids.  $C_{25}H_{43}NO_4$  Colorless oil,  $[\alpha]_D^{22} = +5.0^\circ$  ( $c = 0.24$ ,  $CHCl_3$ ).  
**Source:** Gorgonian *Calicogorgia* sp. (Japan waters). **Pharm:** Toxic (repels proso-branch *Drupella fragum*). **Ref:** M. Ochi, et al, Tet. Lett., 1992, 33, 7531

**756 Calyceramide A**

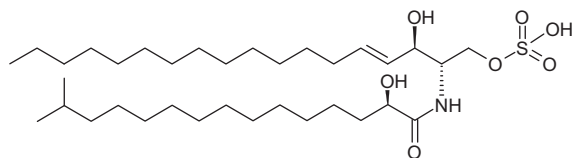
**Type:** Sphingolipids.  $C_{34}H_{67}NO_7S$  Solid (Na salt),  $[\alpha]_D^{20} = +24.8^\circ$  ( $c = 0.1$ , MeOH) (Na salt). **Source:** Lithistid sponge *Discodermia calyx* (off Sikine-jima I., Japan). **Pharm:** Neuraminidase inhibitor ( $IC_{50} = 0.63 \mu\text{mol/L}$ ). **Ref:** Y. Nakao, et al, Tetrahedron, 2001, 57, 3013 | P. L. Winder, et al, Mar. Drugs, 2011, 9, 2644 (rev)

**757 Calyceramide B**

**Type:** Sphingolipids.  $C_{34}H_{67}NO_7S$  Solid (Na salt),  $[\alpha]_D^{20} = +14.5^\circ$  ( $c = 0.1$ , MeOH) (Na salt). **Source:** Lithistid sponge *Discodermia calyx* (off Sikine-jima I., Japan). **Pharm:** Neuraminidase inhibitor ( $IC_{50} = 0.32 \mu\text{mol/L}$ ). **Ref:** Y. Nakao, et al, Tetrahedron, 2001, 57, 3013 | P. L. Winder, et al, Mar. Drugs, 2011, 9, 2644 (rev)

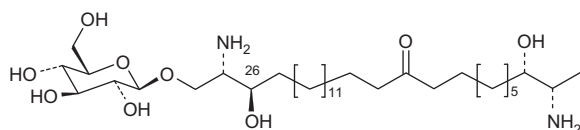
**758 Calyceramide C**

**Type:** Sphingolipids.  $C_{34}H_{67}NO_7S$  Solid (Na salt),  $[\alpha]_D^{20} = +16.9^\circ$  ( $c = 0.1$ , MeOH) (Na salt). **Source:** Lithistid sponge *Discodermia calyx* (off Sikine-jima I., Japan). **Pharm:** Neuraminidase inhibitor ( $IC_{50} = 1.3 \mu\text{mol/L}$ ). **Ref:** Y. Nakao, et al, Tetrahedron, 2001, 57, 3013 | P. L. Winder, et al, Mar. Drugs, 2011, 9, 2644 (rev)



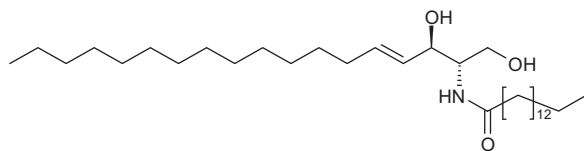
### 759 Calyxoside

**Type:** Sphingolipids.  $C_{34}H_{68}N_2O_9$  Colorless gel-like substance,  $[\alpha]_D^{25} = -15.8^\circ$  ( $c = 0.312$ , MeOH). **Source:** Sponge *Calyx* sp. (Sulawesi, Indonesia). **Pharm:** DNA-damaging agent (RS322 yeast strain,  $IC_{12} = 36 \mu\text{g/mL}$ , RS321 yeast strain  $IC_{12} = 62 \mu\text{g/mL}$ , RS188N yeast strain  $IC_{12} > 1000 \mu\text{g/mL}$ , not act as a topoisomerase I or II inhibitor); cytotoxic (mammalian cell lines: HFF,  $IC_{50} = 20 \mu\text{g/mL}$ , MRC-5,  $IC_{50} = 20 \mu\text{g/mL}$ , SW480,  $IC_{50} = 5.0 \mu\text{g/mL}$ , HT29,  $IC_{50} = 10 \mu\text{g/mL}$ , Saos-2,  $IC_{50} = 5.0 \mu\text{g/mL}$ , DLD-1,  $IC_{50} = 5.0 \mu\text{g/mL}$ , H460,  $IC_{50} = 3.0 \mu\text{g/mL}$ ; relatively weak cytotoxicity without any strong selectivity). **Ref:** B. N. Zhou, et al, *Tetrahedron*, 2001, 57, 9549



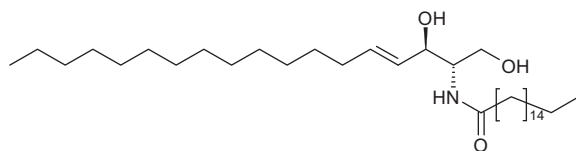
### 760 Caulerpicin A

*N*-Pentadecanoyl-(2*S*,3*R*,4*E*)-2-amino-4-octadecene-1,3-diol **Type:** Sphingolipids.  $C_{33}H_{65}NO_3$  **Source:** Green alga *Caulerpa racemosa*. **Pharm:** Toxin. **Ref:** M. Mahendran, et al, *Phytochemistry*, 1979, 18, 1885



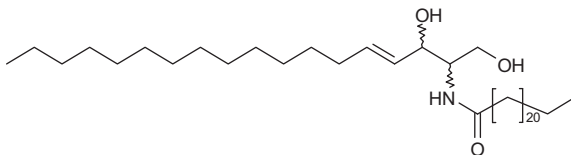
### 761 Caulerpicin B

*N*-Heptadecanoyl-(2*S*,3*R*,4*E*)-2-amino-4-octadecene-1,3-diol **Type:** Sphingolipids.  $C_{35}H_{69}NO_3$  Cryst. **Source:** Green alga *Caulerpa racemosa*. **Pharm:** Toxin. **Ref:** M. Mahendran, et al, *Phytochemistry*, 1979, 18, 1885

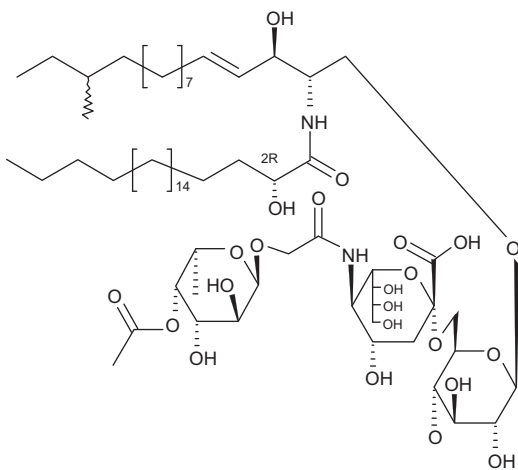


**762 Caulerpicin C**

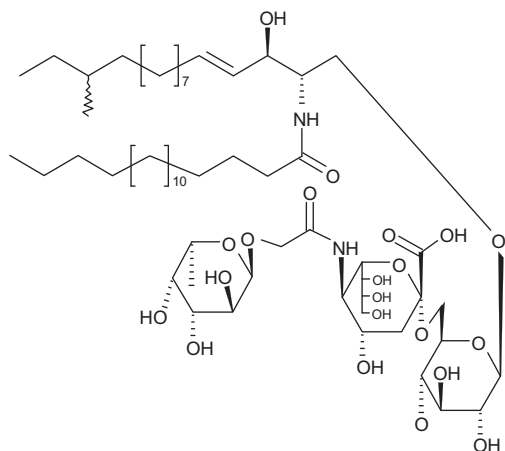
*N*-Tricosanoyl-(2ξ,3ξ,4*E*)-2-amino-4-octadecene-1,3-diol **Type:** Sphingolipids. C<sub>41</sub>H<sub>81</sub>NO<sub>3</sub> Amorph. powder (Me<sub>2</sub>CO), mp 95–96 °C. **Source:** Green algae *Caulerpa racemosa* and *Caulerpa sertularioides*. **Pharm:** Toxin. **Ref:** M. Mahendran, et al, Phytochemistry, 1979, 18, 1885 | S. -H. Xu, et al, Chin. Chem. Lett., 1997, 8, 419

**763 CEG 3**

(2*S*,3*R*,4*E*,14ξ)-*N*<sup>2</sup>-(2'*R*-Hydroxydocosanoyl)-2-imino-14-methyl-4-hexadecene-1,3-diol 1-*O*-[*N*-(4-*O*-acetyl-α-*L*-fucopyranosyloxy)acetyl-α-*D*-neuraminopyranosyl-(2→6)-β-*D*-glucopyranoside] **Type:** Sphingolipids. C<sub>64</sub>H<sub>116</sub>N<sub>2</sub>O<sub>23</sub> Amorph. powder. **Source:** Sea cucumber *Cucumaria echinata*. **Pharm:** Neuritogenic activity (rat pheochromocytoma cell line PC-12 in presence of NGF, most potent). **Ref:** F. Kisa, et al, CPB, 2006, 54, 982

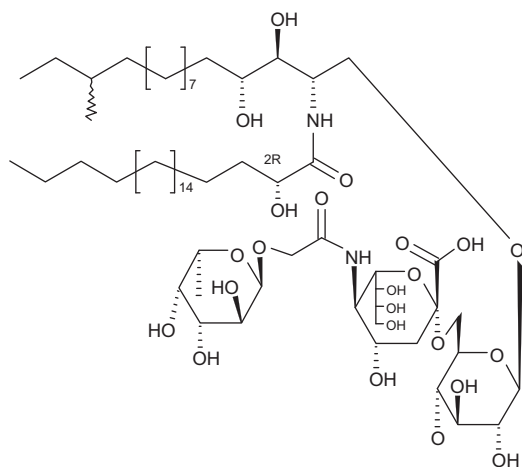
**764 CEG 4**

(2*S*,3*R*,4*E*,14ξ)-*N*<sup>2</sup>-Octadecanoyl-2-imino-14-methyl-4-hexadecene-1,3-diol 1-*O*-[*N*-(α-*L*-fucopyranosyloxy)acetyl-α-*D*-neuraminopyranosyl-(2→6)-β-*D*-glucopyranoside] **Type:** Sphingolipids. C<sub>58</sub>H<sub>106</sub>N<sub>2</sub>O<sub>21</sub> Amorph. powder. **Source:** Sea cucumber *Cucumaria echinata*. **Pharm:** Neuritogenic activity (rat pheochromocytoma cell line PC-12 in presence of NGF). **Ref:** F. Kisa, et al, CPB, 2006, 54, 982

**765 CEG 5**

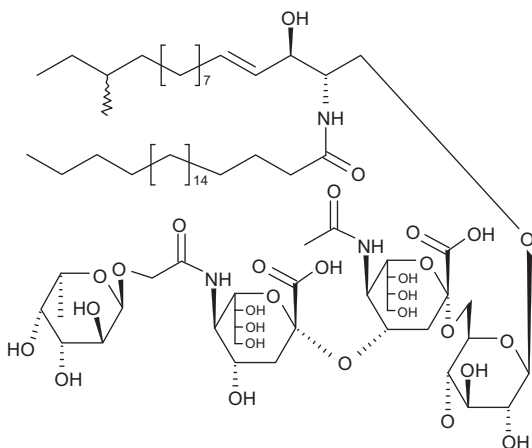
(2*S*,3*S*,4*R*,14*ξ*)-*N*<sup>2</sup>-(2'*R*-Hydroxydocosanoyl)-2-imino-14-methyl-1,3,4-hexadecanetriol 1-*O*-[*N*-( $\alpha$ -*L*-fucopyranosyloxy)acetyl- $\alpha$ -*D*-neuraminopyranosyl-(2 $\rightarrow$ 6)- $\beta$ -*D*-glucopyranoside] Type: Sphingolipids. C<sub>62</sub>H<sub>116</sub>N<sub>2</sub>O<sub>23</sub> Amorph. powder. Source: Sea cucumber *Cucumaria echinata*. Pharm: Neuritogenic activity (rat pheochromocytoma cell line PC-12 in presence of NGF). Ref: F. Kisa, et al, CPB, 2006, 54, 982

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**766 CEG 6**

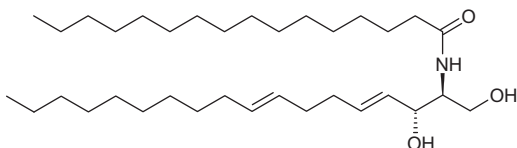
(2*S*,3*R*,4*E*,14*ξ*)-*N*<sup>2</sup>-Docosanoyl-2-imino-14-methyl-4-hexadecene-1,3-diol 1-*O*-[ $\alpha$ -*L*-fucopyranosyl-(1 $\rightarrow$ 2')-*N*-glycolyl- $\alpha$ -*D*-neuraminopyranosyl-(2 $\rightarrow$ 4)-*N*-acetyl- $\alpha$ -*D*-neuraminopyranosyl-(2 $\rightarrow$ 6)- $\beta$ -*D*-glucopyranoside] Type: Sphingolipids. C<sub>73</sub>H<sub>131</sub>N<sub>3</sub>O<sub>29</sub> Amorph. powder. Source: Sea cucumber *Cucumaria echinata* (major component). Pharm:

Neurotogenic activity (rat pheochromocytoma cell line PC-12 in presence of NGF). Ref: F. Kisa, et al, CPB, 2006, 54, 1293



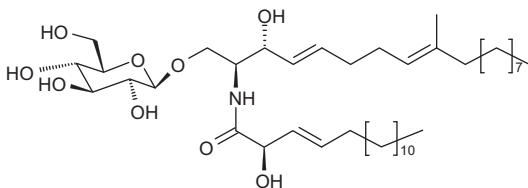
### 767 Ceramide 1

*N*-Hexadecanoyl-2-amino-4,8-octadecadiene-1,3-diol Type: Sphingolipids.  $C_{34}H_{65}NO_3$  Solid, mp 82–83 °C,  $[\alpha]_D^{25} = -8^\circ$  ( $c = 0.5$ ,  $CHCl_3$ ). Source: Green alga *Ulva fasciata* (India waters), gorgonian *Acabaria undulata*. Pharm: Antiviral. Ref: J. Shin, et al, JNP, 1995, 58, 948 | M. Sharma, et al, Bot. Mar., 1996, 39, 213



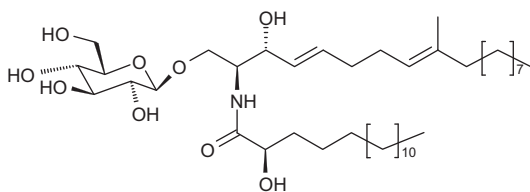
### 768 Cerebroside A

Type: Sphingolipids.  $C_{41}H_{75}NO_9$  Source: Deep-sea fungus *Paecilomyces lilacinus* ZBY-1. Pharm: Cytotoxic (K562, MCF7, HL60 and BGC823 cells,  $IC_{50} = 22.3\text{--}139.0 \mu\text{mol/L}$ ). Ref: X. Cui, et al, J. Int. Pharm. Res., 2013, 40, 177 (in Chinese)

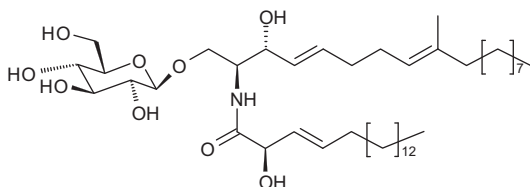


**769 Cerebroside B**

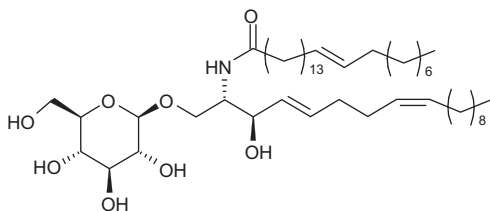
**Type:** Sphingolipids.  $C_{41}H_{77}NO_9$  **Source:** Deep-sea fungus *Paecilomyces lilacinus* ZBY-1. **Pharm:** Cytotoxic (K562, MCF7, HL60 and BGC823 cells,  $IC_{50} = 22.3\text{--}139.0 \mu\text{mol/L}$ ). **Ref:** X. Cui, et al, J. Int. Pharm. Res., 2013, 40, 177 (in Chinese)

**770 Cerebroside C**

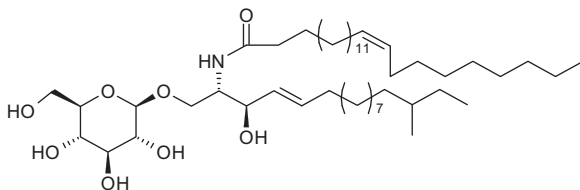
**Type:** Sphingolipids.  $C_{43}H_{79}NO_9$  Cryst., mp 159–169 °C **Source:** Marine-derived fungus *Microsphaeropsis olivacea* from an unidentified sponge (Florida), deep-sea fungus *Paecilomyces lilacinus* ZBY-1. **Pharm:** Cell differentiation inducer; antifungal; cytotoxic (K562, MCF7, HL60 and BGC823 cells,  $IC_{50} = 22.3\text{--}139.0 \mu\text{mol/L}$ ). **Ref:** M. Keusgen, et al, Biochem. Syst. Ecol., 1996, 24, 465 | X. Cui, et al, J. Int. Pharm. Res., 2013, 40, 177 (in Chinese)

**771 Cerebroside CE-1-2**

**Type:** Sphingolipids.  $C_{48}H_{89}NO_8$  Amorph. powder, mp 136–137 °C,  $[\alpha]_D = -1.9^\circ$  ( $c = 0.33$ , 1-PrOH). **Source:** Sea cucumber *Cucumaria echinata* (Japan waters). **Pharm:** Toxic (lethality to brine shrimp). **Ref:** K. Yamada, et al, EurJOC, 1998, 371

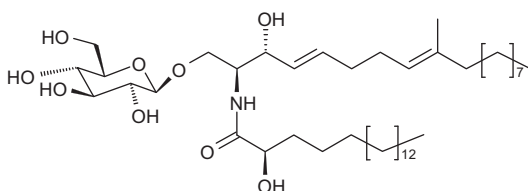
**772 Cerebroside CE-1-3**

**Type:** Sphingolipids.  $C_{48}H_{91}NO_8$  mp 128–129 °C,  $[\alpha]_D = -0.4^\circ$  ( $c = 0.15$ , 1-PrOH). **Source:** Sea cucumber *Cucumaria echinata* (Japan waters). **Pharm:** Toxic (lethality to brine shrimp). **Ref:** K. Yamada, et al, EurJOC, 1998, 371



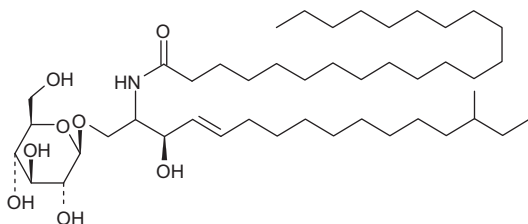
### 773 Cerebroside D

**Type:** Sphingolipids.  $C_{43}H_{81}NO_9$  **Source:** Deep-sea fungus *Paecilomyces lilacinus* ZBY-1. **Pharm:** Cytotoxic (K562, MCF7, HL60 and BGC823 cells,  $IC_{50} = 22.3\text{--}139.0 \mu\text{mol/L}$ ). **Ref:** X. Cui, et al, J. Int. Pharm. Res., 2013, 40, 177 (in Chinese)



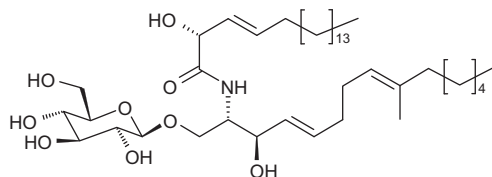
### 774 Cerebroside PA-0-5

Cerebroside CE-1-1 **Type:** Sphingolipids.  $C_{45}H_{87}NO_8$  Amorph. powder, mp 138–140 °C, mp 135–136 °C,  $[\alpha]_D = -7.6^\circ$  (c = 0.89, 1-propanol),  $[\alpha]_D = -5.2^\circ$  (c = 1.42, 1-PrOH). **Source:** Sea cucumbers *Pentacta australis* and *Cucumaria echinata* (Japan waters). **Pharm:** Toxic (brine shrimp). **Ref:** R. Higuchi, et al, Liebigs Ann. Chem., 1994, 653 | K. Yamada, et al, EurJOC, 1998, 371



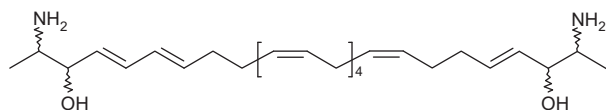
### 775 Chrysoeside B

**Type:** Sphingolipids.  $C_{41}H_{75}NO_9$  **Source:** Mangrove-derived fungus *Penicillium chrysoegenum* (halotolerant) from mangrove *Rhizophora stylosa* (roots, Wenchang, Hainan, China waters). **Pharm:** Antibacterial (*Enterobacter aerogenes*). **Ref:** X. Peng, et al, JNP, 2011, 74, 1298



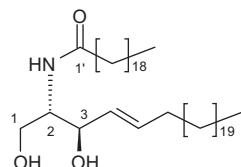
**776 2,29-Diamino-4,6,10,13,16,19,22,26-triacontaoctane-3,28-diol**

**Type:** Sphingolipids.  $C_{30}H_{48}N_2O_2$  **Source:** Calcareous sponge *Leucetta microraphis* (Australia). **Pharm:** PKC inhibitor ( $IC_{50} = 98 \mu\text{mol/L}$ ); inhibiting binding of phorbol ester ( $IC_{50} = 9 \mu\text{mol/L}$ ). **Ref:** R. H. Willis, et al, *Toxicol* 1997, 35, 1125 | S. Kehraus, et al, *JOC*, 2002, 67, 4989 | D. Skropeta, et al, *Mar. Drugs*, 2011, 9, 2131 (rev)



**777 (2S,3R)-1,3-Dihydroxy-2-docosanoyl-amino-4E-hexacocaene**

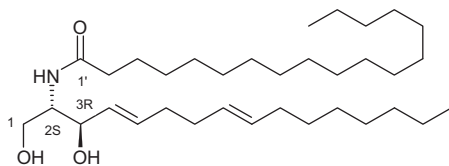
**Type:** Sphingolipids.  $C_{46}H_{91}NO_3$  **Source:** Soft coral *Sinularia candidula* (Safaga, Egyptian Red Sea). **Pharm:** Antiviral (most potent anti-H5N1 virus agent). **Ref:** S. Ahmed, et al, *Tet. Lett.*, 2013, 54, 2377



**778 (2S,3R)-1,3-Dihydroxy-2-octadecanoyl-amino-4E,8E-hexadecadiene**

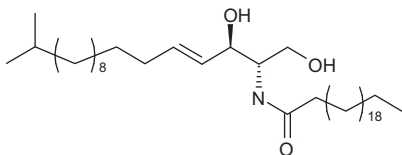
**Type:** Sphingolipids.  $C_{34}H_{65}NO_3$  Cryst. ( $\text{CHCl}_3/\text{MeOH}$ ), mp 98–100 °C,  $[\alpha]_D^{25} = +2.8^\circ$  ( $c = 0.5$ ,  $\text{CHCl}_3$ ). **Source:** Soft corals *Sinularia* sp. (Andaman Is., Indian Ocean) and *Sinularia crassa* (Andaman and Nicobar Is., Indian Ocean). **Pharm:** Antibacterial (*Escherichia coli*, 50  $\mu\text{g/mL}$ , IZD = 11 mm, 100  $\mu\text{g/mL}$ , IZD = 13 mm, 200  $\mu\text{g/mL}$ , IZD = 16 mm; *Bacillus subtilis*, 50  $\mu\text{g/mL}$ , IZD = 13 mm, 100  $\mu\text{g/mL}$ , IZD = 15 mm, 200  $\mu\text{g/mL}$ , IZD = 18 mm; *Bacillus pumilus*, 50  $\mu\text{g/mL}$ , IZD = 12 mm, 100  $\mu\text{g/mL}$ , IZD = 14 mm, 200  $\mu\text{g/mL}$ , IZD = 16 mm); antifungal (*Pseudomonas aeruginosa*, 50  $\mu\text{g/mL}$ , IZD = 12 mm, 100  $\mu\text{g/mL}$ , IZD = 15 mm, 200  $\mu\text{g/mL}$ , IZD = 17 mm; *Aspergillus niger*, 50  $\mu\text{g/mL}$ , IZD = 12 mm, 100  $\mu\text{g/mL}$ , IZD = 15 mm, 200  $\mu\text{g/mL}$ , IZD = 16 mm; *Rhizopus oryzae*, 50  $\mu\text{g/mL}$ , IZD = 11 mm, 100  $\mu\text{g/mL}$ , IZD = 13 mm, 200  $\mu\text{g/mL}$ , IZD = 15 mm; yeast *Candida albicans*, 50  $\mu\text{g/mL}$ , IZD = 8 mm, 100  $\mu\text{g/mL}$ , IZD = 10 mm, 200  $\mu\text{g/mL}$ , IZD = 11 mm). **Ref:** V. Anjaneyulu, et al, *Ind. J. Chem., Sect B*, 1999, 38, 457 | A.S.Dmitrenok, et al, *Russ. Chem. Bull.*, 2003, 52, 1868





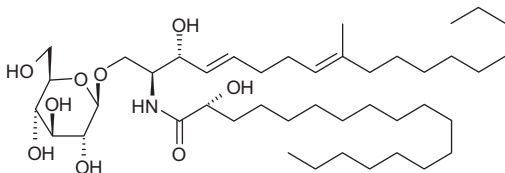
**779 N-Docosanoyl-D-erythro-(2S,3R)-16-methyl-heptadecaspHING-4(E)-enine**

**Type:** Sphingolipids.  $C_{40}H_{79}NO_3$  Powder,  $[\alpha]_D^{25} = -6.0^\circ$  ( $c = 0.01$ ,  $CHCl_3$ ). **Source:** Sponge *Haliclona koremella* (Palau, Oceania, Oceania). **Pharm:** Antifoulant (spores of *Ulva conglobata*); antimicrobial. **Ref:** T. Hattori, K. et al, JNP, 1998, 61, 823



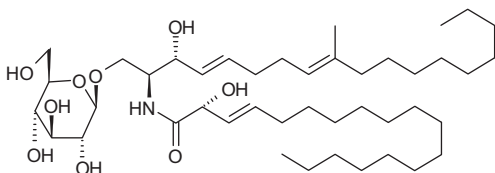
**780 Flavicerebroside A**

**Type:** Sphingolipids.  $C_{43}H_{81}NO_9$  **Source:** Marine-derived fungus *Aspergillus flavipes* (mycelium) from sea anemone *Anthopleura xanthogrammica*. **Pharm:** Cytotoxic (KB). **Ref:** M. Saleem, et al, NPR, 2007, 24, 1142 (rev)



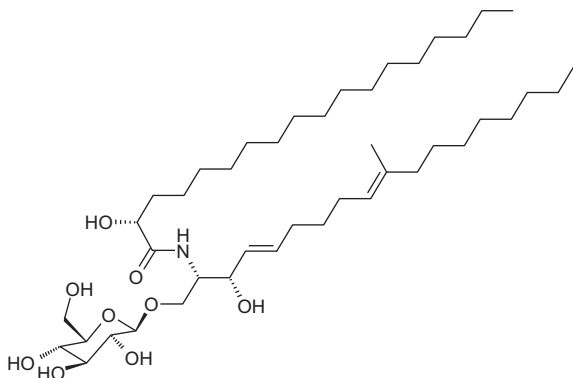
**781 Flavicerebroside B**

**Type:** Sphingolipids.  $C_{43}H_{79}NO_9$  **Source:** Marine-derived fungus *Aspergillus flavipes* (mycelium) from sea anemone *Anthopleura xanthogrammica*. **Pharm:** Cytotoxic (KB). **Ref:** M. Saleem, et al, NPR, 2007, 24, 1142 (rev)

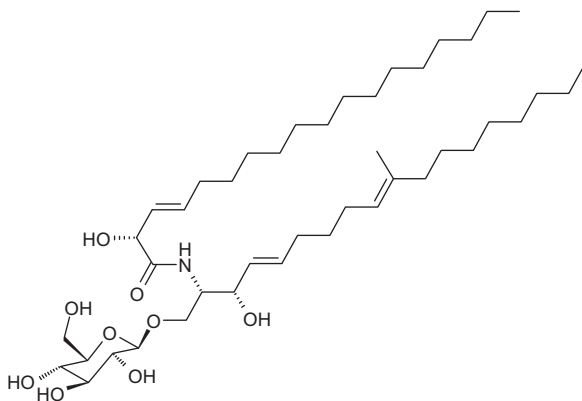


**782 Flavuside A**

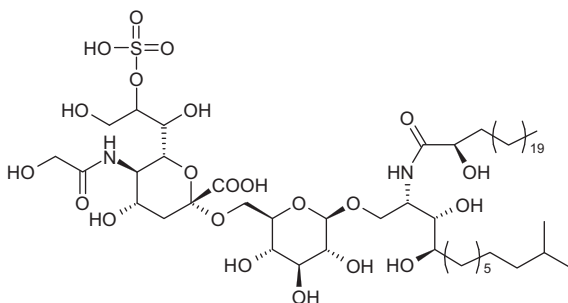
Type: Sphingolipids.  $C_{43}H_{81}NO_9$  Source: Marine-derived fungus *Aspergillus flavus*.  
Pharm: Antibacterial (*Staphylococcus aureus*, MIC = 15.6  $\mu\text{g}/\text{mL}$ ; MRSA, MIC = 31.2  $\mu\text{g}/\text{mL}$ ). Ref: G. Yang, et al, CPB, 2011, 59, 1174

**783 Flavuside B**

Type: Sphingolipids.  $C_{43}H_{79}NO_9$  Source: Marine-derived fungus *Aspergillus flavus*.  
Pharm: Antibacterial (*Staphylococcus aureus*, MIC = 15.6  $\mu\text{g}/\text{mL}$ ; MRSA, MIC = 31.2  $\mu\text{g}/\text{mL}$ ). Ref: G. Yang, et al, CPB, 2011, 59, 1174

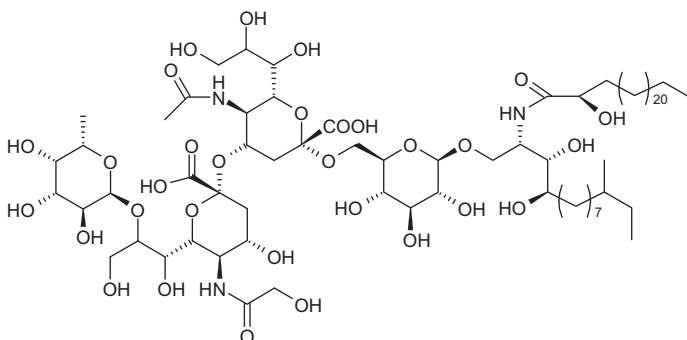
**784 Ganglioside CG-1**

Type: Sphingolipids.  $C_{54}H_{102}N_2O_{22}S$  mp 129–130 °C. Source: Sea cucumber *Cucumaria echinata* (Japan waters). Pharm: Toxic (lethality to brine shrimp); neuritogenic (rat, pheochromocytoma PC-12 cell lines). Ref: K. Yamada, et al, EurJOC, 1998, 371



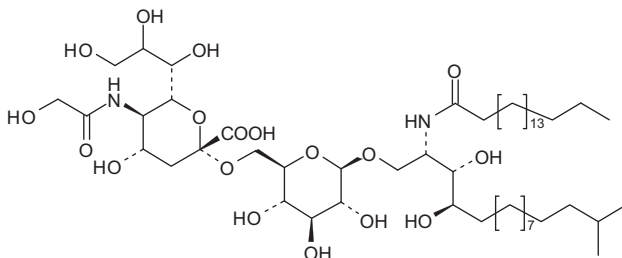
### 785 Ganglioside HPG-1

**Type:** Sphingolipids.  $C_{74}H_{135}N_3O_{31}$  mp 261–270 °C. **Source:** Sea cucumber *Holothuria pervicax* (Japan waters). **Pharm:** Neuritogenic (rat pheochromocytoma cell line PC-12). **Ref:** K. Yamada, et al, EurJOC, 1998, 2519



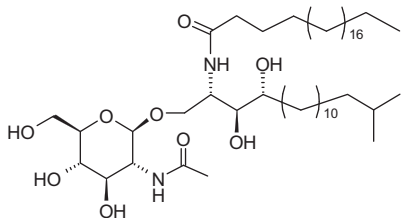
### 786 Ganglioside SJG-1

**Type:** Sphingolipids.  $C_{52}H_{98}N_2O_{18}$  mp 159–160 °C. **Source:** Sea cucumber *Stichopus japonicus* (Japan waters). **Pharm:** Neuritogenic (rat pheochromocytoma cell line PC-12 in 10 µg/mL). **Ref:** M. Kaneko, et al, EurJOC, 1999, 3171

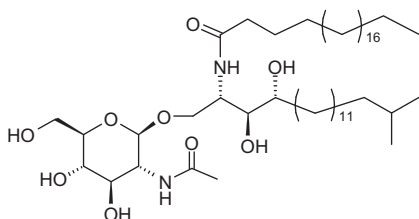


**787 Halicylindroside A<sub>1</sub>**

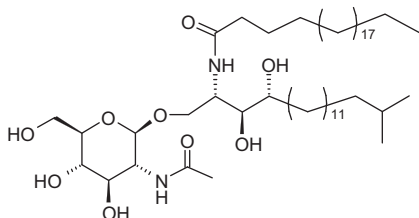
*N*-Docosanoyl-(2*S*,3*S*,4*R*)-2-amino-16-methyl-1,3,4-heptadecanetriol 1-*O*-(2-acetamido-2-deoxy- $\beta$ -*D*-glucopyranoside) Type: Sphingolipids. C<sub>48</sub>H<sub>94</sub>N<sub>2</sub>O<sub>9</sub> Solid,  $[\alpha]_D^{23} = -20.2^\circ$  (Py). Source: Sponge *Halichondria cylindrata* (Japan waters). Pharm: Antifungal (*Mortierella ramanniana*, 250  $\mu$ g/disk); cytotoxic (P<sub>388</sub>, 6.8  $\mu$ g/mL). Ref: H. Li, et al, Tetrahedron, 1995, 51, 2773

**788 Halicylindroside A<sub>2</sub>**

Type: Sphingolipids. C<sub>49</sub>H<sub>96</sub>N<sub>2</sub>O<sub>9</sub> Solid,  $[\alpha]_D^{23} = -21.1^\circ$  (Py). Source: Sponge *Halichondria cylindrata* (Japan waters). Pharm: Antifungal (*Mortierella ramanniana*, 250  $\mu$ g/disk); cytotoxic (P<sub>388</sub>, 6.8  $\mu$ g/mL). Ref: H. Li, et al, Tetrahedron, 1995, 51, 2773

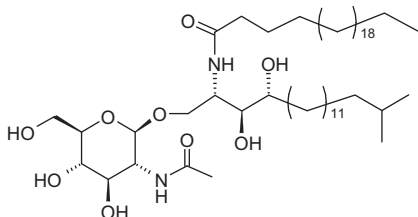
**789 Halicylindroside A<sub>3</sub>**

Type: Sphingolipids. C<sub>50</sub>H<sub>98</sub>N<sub>2</sub>O<sub>9</sub> Solid,  $[\alpha]_D^{23} = -19.5^\circ$  (Py). Source: Sponge *Halichondria cylindrata* (Japan waters). Pharm: Antifungal (*Mortierella ramanniana*, 250  $\mu$ g/disk); cytotoxic (P<sub>388</sub>, 6.8  $\mu$ g/mL). Ref: H. Li, et al, Tetrahedron, 1995, 51, 2773

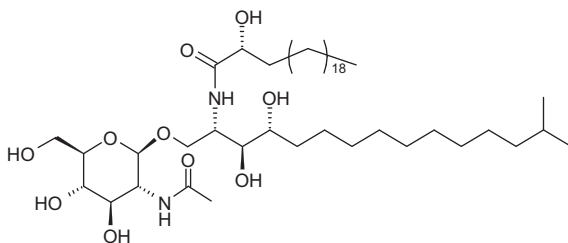


**790 Halicylindroside A<sub>4</sub>**

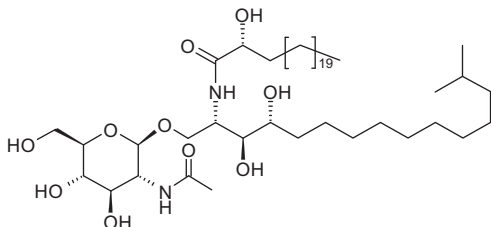
**Type:** Sphingolipids. C<sub>51</sub>H<sub>100</sub>N<sub>2</sub>O<sub>9</sub> Solid,  $[\alpha]_D^{23} = -22.3^\circ$  (Py). **Source:** Sponge *Halichondria cylindrata* (Japan waters). **Pharm:** Antifungal (*Mortierella ramanniana*, 250 µg/disk); cytotoxic (P<sub>388</sub>, 6.8 µg/mL). **Ref:** H. Li, et al, Tetrahedron, 1995, 51, 2773

**791 Halicylindroside B<sub>1</sub>**

**Type:** Sphingolipids. C<sub>46</sub>H<sub>90</sub>N<sub>2</sub>O<sub>10</sub> Solid,  $[\alpha]_D^{23} = -9.2^\circ$  (Py). **Source:** Sponge *Halichondria cylindrata* (Japan waters). **Pharm:** Antifungal (*Mortierella ramanniana*, 250 µg/disk); cytotoxic (P<sub>388</sub>, 6.8 µg/mL). **Ref:** H. Li, et al, Tetrahedron, 1995, 51, 2773

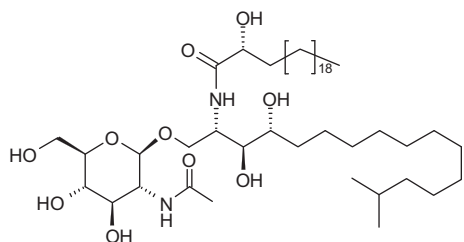
**792 Halicylindroside B<sub>2</sub>**

**Type:** Sphingolipids. C<sub>47</sub>H<sub>92</sub>N<sub>2</sub>O<sub>10</sub> Solid,  $[\alpha]_D^{23} = -9.0^\circ$  (Py). **Source:** Sponge *Halichondria cylindrata* (Japan waters). **Pharm:** Antifungal (*Mortierella ramanniana*, 250 µg/disk); cytotoxic (P<sub>388</sub>, 6.8 µg/mL). **Ref:** H. Li, et al, Tetrahedron, 1995, 51, 2773

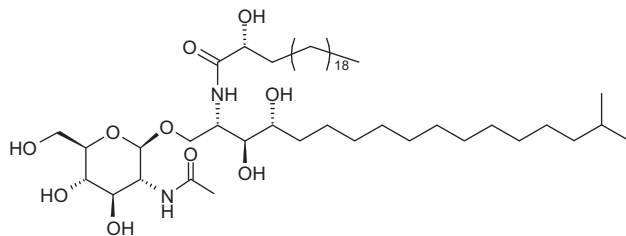


**793 Halicylindroside B<sub>3</sub>**

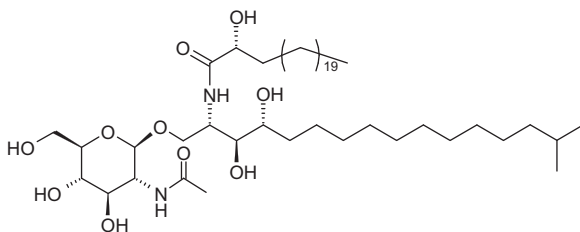
*N*-(2*R*-Hydroxydocosanoyl)-(2*S*,3*S*,4*R*)-2-amino-15-methyl-1,3,4-hexadecanetriol 1-*O*-(2-acetamido-2-deoxy- $\beta$ -*D*-glucopyranoside) **Type:** Sphingolipids. C<sub>47</sub>H<sub>92</sub>N<sub>2</sub>O<sub>10</sub> Solid,  $[\alpha]_D^{23} = -9.7^\circ$  (Py). **Source:** Sponge *Halichondria cylindrata* (Japan waters). **Pharm:** Antifungal (*Mortierella ramanniana*, 250  $\mu$ g/disk); cytotoxic (P<sub>388</sub>, 6.8  $\mu$ g/mL). **Ref:** H. Li, et al, Tetrahedron, 1995, 51, 2773

**794 Halicylindroside B<sub>4</sub>**

*N*-(2*R*-Hydroxydocosanoyl)-(2*S*,3*S*,4*R*)-2-amino-16-methyl-1,3,4-heptadecanetriol 1-*O*-(2-acetamido-2-deoxy- $\beta$ -*D*-glucopyranoside) **Type:** Sphingolipids. C<sub>48</sub>H<sub>94</sub>N<sub>2</sub>O<sub>10</sub> Solid,  $[\alpha]_D^{23} = -8.5^\circ$  (Py). **Source:** Sponge *Halichondria cylindrata* (Japan waters). **Pharm:** Antifungal (*Mortierella ramanniana*, 250  $\mu$ g/disk); cytotoxic (P<sub>388</sub>, 6.8  $\mu$ g/mL). **Ref:** H. Li, et al, Tetrahedron, 1995, 51, 2773

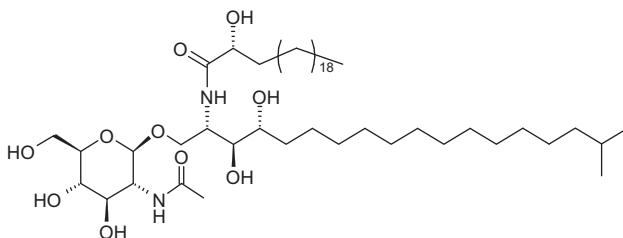
**795 Halicylindroside B<sub>5</sub>**

*N*-(2*R*-Hydroxytricosanoyl)-(2*S*,3*S*,4*R*)-2-amino-15-methyl-1,3,4-hexadecanetriol 1-*O*-(2-acetamido-2-deoxy- $\beta$ -*D*-glucopyranoside) **Type:** Sphingolipids. C<sub>48</sub>H<sub>94</sub>N<sub>2</sub>O<sub>10</sub> Solid,  $[\alpha]_D^{23} = -8.6^\circ$  (Py). **Source:** Sponge *Halichondria cylindrata* (Japan waters). **Pharm:** Antifungal (*Mortierella ramanniana*, 250  $\mu$ g/disk); cytotoxic (P<sub>388</sub>, 6.8  $\mu$ g/mL). **Ref:** H. Li, et al, Tetrahedron, 1995, 51, 2773



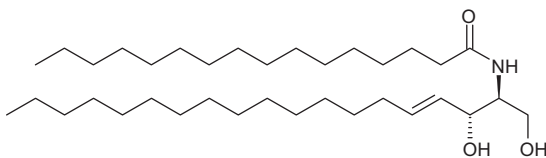
### 796 Halicylindroside B<sub>6</sub>

**Type:** Sphingolipids. C<sub>49</sub>H<sub>96</sub>N<sub>2</sub>O<sub>10</sub> Solid,  $[\alpha]_D^{23} = -8.3^\circ$  (Py). **Source:** Sponge *Halichondria cylindrata* (Japan waters). **Pharm:** Antifungal (*Mortierella ramanniana*, 250 µg/disk); cytotoxic (P<sub>388</sub>, 6.8 µg/mL). **Ref:** H. Li, et al, Tetrahedron, 1995, 51, 2773



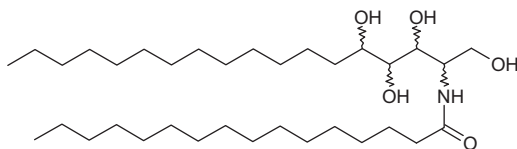
### 797 *N*-Hexadecanoyl-(2*S*,3*R*,4*E*)-2-amino-4-nonadecene-1,3-diol

**Type:** Sphingolipids. C<sub>35</sub>H<sub>69</sub>NO<sub>3</sub> Amorph. powder (hexane/EtOAc), mp 104–105 °C,  $[\alpha]_D = -6^\circ$  ( $c = 1.3$ , CHCl<sub>3</sub>). **Source:** Gorgonian *Pseudopterogorgia* sp. (Indian Ocean), soft coral *Cladiella* sp. **Pharm:** Antibacterial (1 mg/mL, gram-positive: *Bacillus pumilis*, *Bacillus subtilis*, *Staphylococcus epidermis*, MIC = 100 µg/mL; gram-negative: *Escherichia coli* and *Pseudomonas aeruginosa*). **Ref:** M. Vanisree, et al, J. Asian Nat. Prod. Res., 2001, 3, 23



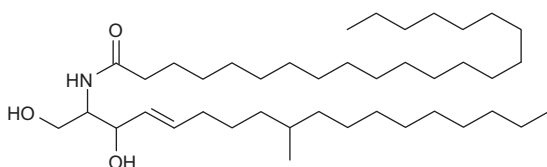
### 798 (*all-ξ*)-*N*-Hexadecanoyl-2-imino-1,3,4,5-octadecanetetrol

**Type:** Sphingolipids. C<sub>34</sub>H<sub>69</sub>NO<sub>5</sub> mp 143–144 °C,  $[\alpha]_D = +182^\circ$  ( $c = 0.5$ , MeOH). **Source:** Green alga *Ulva fasciata* (India waters). **Pharm:** Antiviral (mus, *in vivo*, SFV). **Ref:** H. S. Garg, et al, Tet. Lett., 1992, 33, 1641



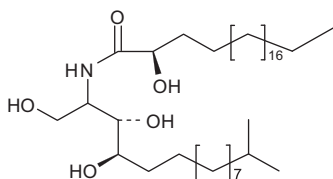
**799 N-(2-Hydroxydocosanoyl)-2-amino-9-methyl-4-octadecene-1,3-diol**

Type: Sphingolipids.  $C_{41}H_{81}NO_3$  Source: Sponge *Haliclona* sp. (Jiddah, Saudi Arabia). Pharm: Cytotoxic (normal fibroblast line NIH3T3,  $IC_{50} = 20 \mu\text{mol/L}$ ; virally transformed form KA3IT,  $IC_{50} = 10 \mu\text{mol/L}$ ). Ref: S. -E. N. Ayyad, et al, Nat. Prod. Res., 2009, 23, 44.



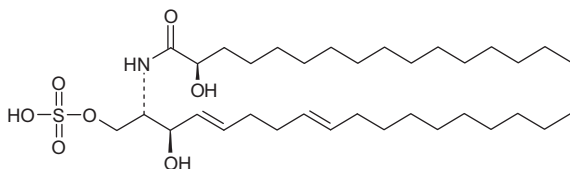
**800 N-(2R-Hydroxydocosanoyl)-2-amino-14-methyl-1,3,4-pentadecanetriol**

Type: Sphingolipids.  $C_{38}H_{77}NO_5$  Amorph. powder,  $[\alpha]_D = +9.6^\circ$  ( $c = 0.05$ , MeOH). Source: Ascidian *Cystodytes* cf. *dellechiajei* (Tunisia). Pharm:  $PLA_2$  inhibitor. Ref: A. Loukaci, et al, JNP, 2000, 63, 799



**801 N-(2R-Hydroxyhexadecanoyl)-2-amino-4,8-octadecadiene-1,3-diol 1-O-sulfate**

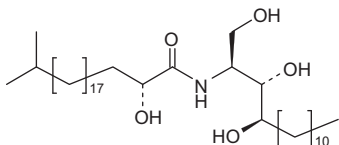
Type: Sphingolipids.  $C_{34}H_{65}NO_7S$   $[\alpha]_D = +17^\circ$  ( $c = 0.06$ ,  $CHCl_3$ ). Source: Bryozoan *Watersipora cucullata* (Japan waters). Pharm: DNA topoisomerase I inhibitor. Ref: M. Ojika, et al, Tet. Lett., 1997, 38, 4235



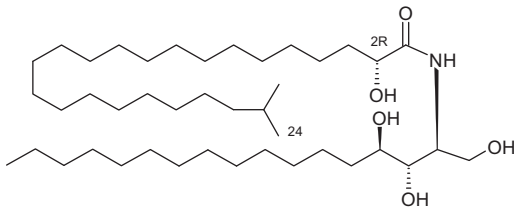


**802 N-(2R-Hydroxy-21-methyldocosanoyl)-2-amino-1,3,4-pentadecanetriol**

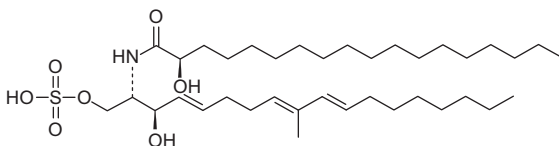
Type: Sphingolipids.  $C_{38}H_{77}NO_5$  Source: Hair crab *Erimacrus isenbeckii*. Pharm: Pheromone. Ref: N. Asai, et al, Tetrahedron, 2000, 56, 9895

**803 N-(2R-Hydroxy-23-methyltetracosanoyl)-(2S,3S,4R)-2-amino-1,3,4-heptadecanetriol**

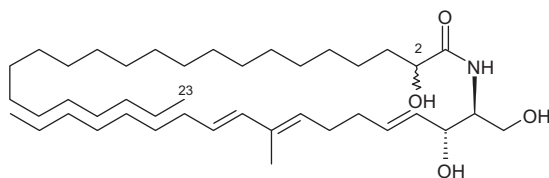
Type: Sphingolipids.  $C_{42}H_{85}NO_5$  Source: Crab *Erimacrus isenbeckii* (sex pheromone). Pharm: Sex pheromone (crab *Erimacrus isenbeckii*). Ref: N. Asai, et al, Tetrahedron, 2000, 56, 9895

**804 N-(2R-Hydroxyoctadecanoyl)-2-amino-9-methyl-4,8,10-octadecatriene-1,3-diol-1-O-sulfate**

Type: Sphingolipids.  $C_{37}H_{69}NO_7S$   $[\alpha]_D^{25} = +16^\circ$  ( $c = 0.05$ , MeOH). Source: Bryozoan *Watersipora cucullata* (Japan waters). Pharm: DNA topoisomerase I inhibitor. Ref: M. Ojika, et al, Tet. Lett., 1997, 38, 4235

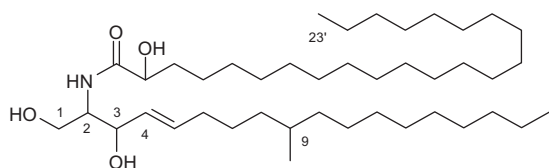
**805 N-(2ξ-Hydroxytricosanoyl)-2-amino-9-methyl-4,8,10-octadecatriene-1,3-diol**

Type: Sphingolipids.  $C_{42}H_{79}NO_4$  Colourless oil. Source: Sponge *Haliclona* sp. (Jjddah, Saudi Arabia). Pharm: Cytotoxic (normal fibroblast line NIH3T3,  $IC_{50} = 18 \mu\text{mol/L}$ ; virally transformed form KA3IT,  $IC_{50} = 8 \mu\text{mol/L}$ ). Ref: S. -E. N. Ayyad, et al, Nat. Prod. Res., 2009, 23, 44



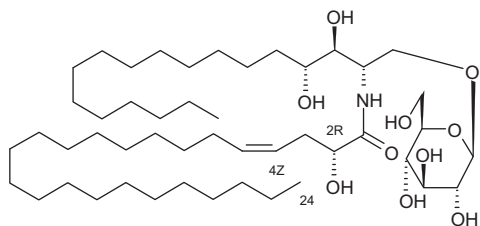
### 806 *N*-(2-Hydroxytricosanoyl)-2-amino-9-methyl-4-octadecene-1,3-diol

**Type:** Sphingolipids.  $C_{42}H_{83}NO_4$  Colourless oil. **Source:** Sponge *Haliclona* sp. (Jjddah, Saudi Arabia). **Pharm:** Cytotoxic (normal fibroblast line NIH3T3,  $IC_{50} = 18 \mu\text{mol/L}$ ; virally transformed form KA3IT,  $IC_{50} = 8 \mu\text{mol/L}$ ). **Ref:** S. -E. N. Ayyad, et al, Nat. Prod. Res., 2009, 23, 44



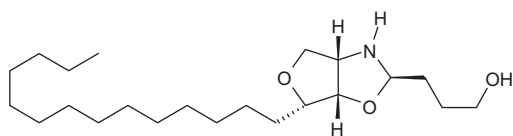
### 807 Iotrordoside A

*N*-(2*R*-Hydroxy-4*Z*-tetracosenoyl)-(2*S*,3*S*,4*R*)-2-amino-1,3,4-octadecanetriol 1-*O*- $\beta$ -*D*-glucopyranoside **Type:** Sphingolipids.  $C_{48}H_{93}NO_{10}$  Amorph. solid,  $[\alpha]_D^{25} = -7.2^\circ$  ( $c = 0.003$ , Py). **Source:** Sponge *Ietrochota* sp. (South China waters Sea near Hainan I., China waters). **Pharm:** Cytotoxic ( $L_{1210}$ ,  $ED_{50} = 0.08 \mu\text{g/mL}$ ). **Ref:** S. -Z. Deng, et al, Chin. J. Chem., 2001, 19, 362



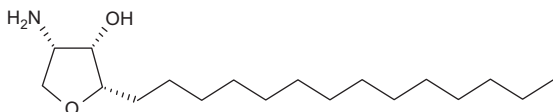
### 808 Jaspine A

**Type:** Sphingolipids.  $C_{22}H_{43}NO_3$  Amorph. powder. **Source:** Sponge *Jaspis* sp. **Pharm:** Cytotoxic ( $A549$ ,  $IC_{50} = 0.34 \mu\text{mol/L}$ ). **Ref:** V. Ledroit, et al, Tet. Lett., 2003, 44, 225

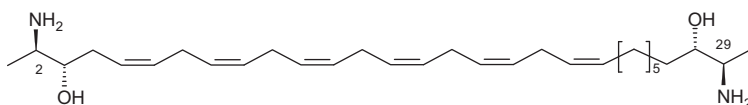


**809 Jaspine B**

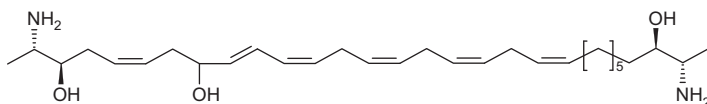
Pachastrissamine Type: Sphingolipids.  $C_{18}H_{37}NO_2$  Powder,  $[\alpha]_D = +7^\circ$  ( $c = 0.1$ ,  $CHCl_3$ ),  $[\alpha]_D = +18^\circ$  ( $c = 0.1$ , EtOH). Source: Sponges *Jaspis* sp. and *Pachastrissa* sp. Pharm: Cytotoxic (MDA231, HeLa and CNE, strong); sphingomyelin synthase inhibitor (hmn melanoma cells, increasing ceramide levels and thus triggering apoptosis which accounts for compound's reported cytotoxicity). Ref: I. Kuroda, et al, JNP, 2002, 65, 1505 | V. Ledroit, et al, Tet. Lett., 2003, 44, 225 | Y. Salma, et al, Biochem. Pharmacol., 2009, 78, 477

**810 Leucettamol A**

Type: Sphingolipids.  $C_{30}H_{52}N_2O_2$  Pale yellow oil,  $[\alpha]_D = -3.8^\circ$  ( $c = 4.4$ , MeOH). Source: Calcareous sponges *Leucetta microraphis* and *Leucetta* aff. *microraphis*. Pharm: Ubiquitin Ubc13-Uev1a complex inhibitor (potential as anticancer agent, potent); non-electrophilic activator of transient receptor potential (TRP) ion channels; pain modulator (potential). Ref: S. Tsukamoto, et al, BoMCL, 2008, 24, 6319 | D. S. Dalisay, et al, JNP, 2009, 72, 353 | G. Chianese, et al, Mar. Drugs, 2012, 10, 2435

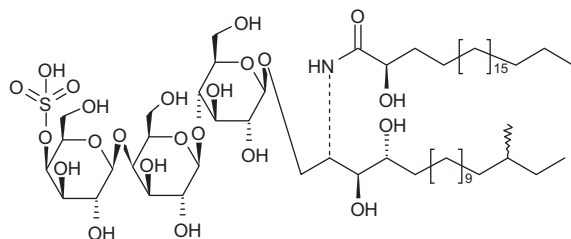
**811 Leucettamol B**

Type: Sphingolipids.  $C_{30}H_{52}N_2O_3$  Pale yellow oil. Source: Calcareous sponge *Leucetta microraphis* (Pohnpei I., Federated States of Micronesia). Pharm: Non-electrophilic activator of transient receptor potential (TRP) ion channels; pain modulator (potential); antibacterial (*Bacillus subtilis*). Ref: F. Kong, et al, JOC, 1993, 58, 970 | G. Chianese, et al, Mar. Drugs, 2012, 10, 2435

**812 Luidia maculata Ganglioside 1**

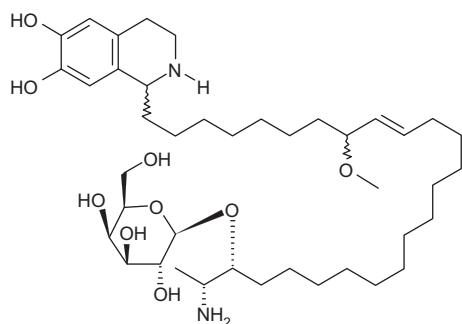
LMG 1 Type: Sphingolipids.  $C_{59}H_{113}NO_{23}S$  Amorph. powder. Source: Starfish *Luidia maculata*. Pharm: Exhibits neurotogenic activity; promotes bone formation. Ref:

S. Kawatake, et al, Liebigs Ann./Recl., 1997, 1797 | CRC Press, DNP on DVD, 2012, version 20.2



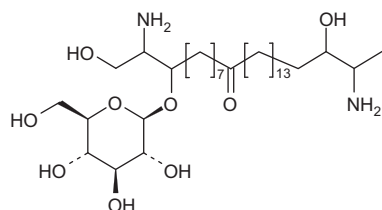
### 813 Oceanalin A

Type: Sphingolipids.  $C_{41}H_{72}N_2O_9$  Amorph. solid,  $[\alpha]_D = -5.7^\circ$  ( $c = 0.14$ , EtOH).  
Source: Sponge *Oceanapia* sp. Pharm: Antifungal (*Candida glabrata*, MIC = 30  $\mu\text{g}/\text{mL}$ ).  
Ref: T. N. Makarieva, et al, Org. Lett., 2005, 7, 2897



### 814 Oceanapiside

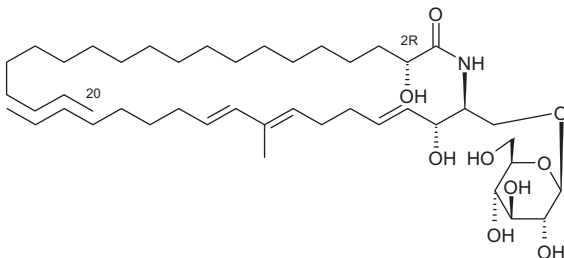
Type: Sphingolipids.  $C_{34}H_{68}N_2O_9$  Amorph. solid,  $[\alpha]_D = -5.5^\circ$  ( $c = 1.2$ , MeOH).  
Source: Sponge *Oceanapia phillipensis* (South Australia). Pharm: Antifungal (*Candida glabrata*, MIC = 10  $\mu\text{g}/\text{mL}$ ).  
Ref: G. M. Nicholas, et al, JNP, 1999, 62, 1678



### 815 Ophidiacerebroside A

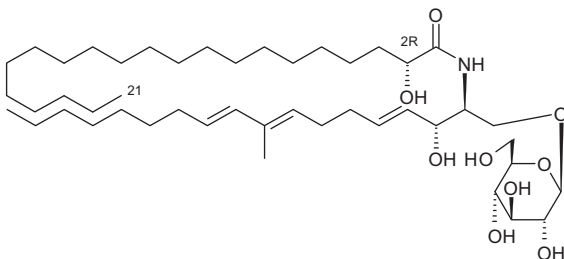
*N*-(2*R*-Hydroxyeicosanoyl)-(2*S*,3*R*,4*E*,8*E*,10*E*)-2-amino-9-methyl-4,8,10-octadecatriene-1,3-diol 1-*O*- $\beta$ -*D*-glucopyranoside Type: Sphingolipids.  $C_{45}H_{83}NO_9$  Colorless. Source:

Starfish *Ophidiaster ophidiamus* (Mediterranean Sea). Pharm: Cytotoxic (L<sub>1210</sub>, 2 µg/mL, InRt = 92%). Ref: W. Jin, et al, JOC, 1994, 59, 144



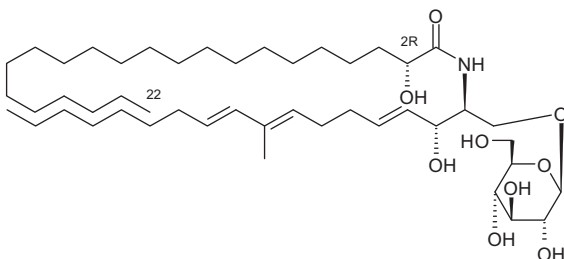
### 816 Ophidiacerebroside B

*N*-(2*R*-Hydroxyhenicosanoyl)-(2*S*,3*R*,4*E*,8*E*,10*E*)-2-amino-9-methyl-4,8,10-octadecatriene-1,3-diol 1-*O*-β-*D*-glucopyranoside Type: Sphingolipids. C<sub>46</sub>H<sub>85</sub>NO<sub>9</sub> Colorless. Source: Starfish *Ophidiaster ophidiamus* (Mediterranean Sea). Pharm: Cytotoxic (L<sub>1210</sub>, 2 µg/mL, InRt = 70%). Ref: W. Jin, et al, JOC, 1994, 59, 144



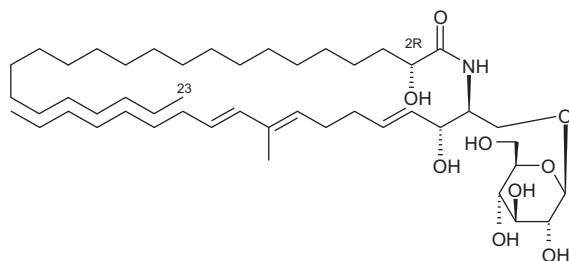
### 817 Ophidiacerebroside C

*Stellaster* Cerebroside S-1-3; *N*-(2*R*-Hydroxydocosanoyl)-(2*S*,3*R*,4*E*,8*E*,10*E*)-2-amino-9-methyl-4,8,10-octadecatriene-1,3-diol 1-*O*-β-*D*-glucopyranoside Type: Sphingolipids. C<sub>47</sub>H<sub>87</sub>NO<sub>9</sub> Amorph. powder, mp 103–105 °C, [α]<sub>D</sub> = +9.5° (c = 0.2, 1-propanol). Source: Starfishes *Ophidiaster ophidiamus* (Mediterranean Sea), *Oreaster reticulatus* and *Stellaster equestris*. Pharm: Cytotoxic (L<sub>1210</sub>, 2 µg/mL, InRt = 96%). Ref: W. Jin, et al, JOC, 1994, 59, 144 | R. Higuchi, et al, Annalen, 1996, 593

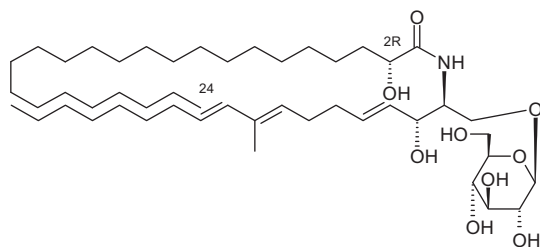


**818 Ophidiacerebroside D**

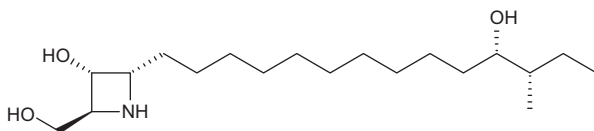
*Stellaster* Cerebroside S-1-4; *N*-(2*R*-Hydroxytricosanoyl)-(2*S*,3*R*,4*E*,8*E*,10*E*)-2-amino-9-methyl-4,8,10-octadecatriene-1,3-diol 1-*O*-β-*D*-glucopyranoside Type: Sphingolipids. C<sub>48</sub>H<sub>89</sub>NO<sub>9</sub> Amorph. powder, mp 109–111 °C, [α]<sub>D</sub> = +9.9° (c = 0.2, 1-propanol). Source: Starfishes *Ophidiaster ophidiamus* (Mediterranean Sea), *Oreaster reticulatus* and *Stellaster equestris*. Pharm: Cytotoxic (L<sub>1210</sub>, 2 μg/mL, InRt = 90%). Ref: W. Jin, et al, JOC, 1994, 59, 144 | R. Higuchi, et al, Annalen, 1996, 593

**819 Ophidiacerebroside E**

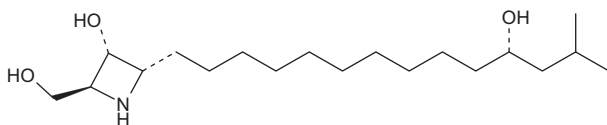
*Stellaster* Cerebroside S-1-5; Agelasphin 10; *N*-(2*R*-Hydroxytetracosanoyl)-(2*S*,3*R*,4*E*,8*E*,10*E*)-2-amino-9-methyl-4,8,10-octadecatriene-1,3-diol 1-*O*-β-*D*-glucopyranoside Type: Sphingolipids. C<sub>49</sub>H<sub>91</sub>NO<sub>9</sub> Amorph. powder, mp 141–142 °C, mp 98–100 °C, [α]<sub>D</sub><sup>24</sup> = +3.0° (c = 0.10, Py), [α]<sub>D</sub><sup>28</sup> = -1.6° (c = 1.0, 1-propanol), [α]<sub>D</sub> = +9.6° (c 0.2, propanol); [α]<sub>D</sub> = -1.6° (c 1, propanol). Source: Sponge *Agelas mauritanus*, starfishes *Ophidiaster ophidiamus* (Mediterranean Sea), *Oreaster reticulatus* and *Stellaster equestris*. Pharm: Immunostimulant; cytotoxic (L<sub>1210</sub>, 2 μg/mL, InRt = 84%). Ref: W. Jin, et al, JOC, 1994, 59, 144 | T. Natori, et al, Tetrahedron, 1994, 50, 2771 | R. Higuchi, et al, Annalen, 1996, 593

**820 Penaresidin A**

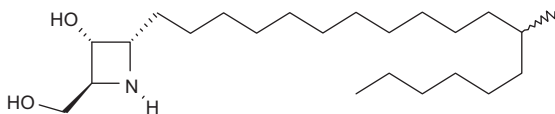
Type: Sphingolipids. C<sub>19</sub>H<sub>39</sub>NO<sub>3</sub> Source: Sponge *Penares* sp. (Okinawa). Pharm: PKC inhibitor; actomyosin ATPase inhibitor. Ref: J. Kobayashi, et al, JCS Perkin I, 1991, 1135 | J. Kobayashi, et al, Tet. Lett., 1996, 37, 6775 | D. -G. Liu, et al, Tet. Lett., 1999, 40, 337

**821 Penaresidin B**

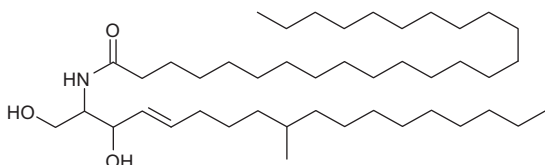
**Type:** Sphingolipids.  $C_{19}H_{39}NO_3$  Isol. as an inseparable mixture with Penaresidin A. **Source:** Sponges *Penares* sp. (Okinawa) and *Penares* sp. **Pharm:** PKC inhibitor; actomyosin ATPase activator. **Ref:** J. Kobayashi, et al, JCS Perkin I, 1991, 1135 | J. Kobayashi, et al, Tet. Lett., 1996, 37, 6775

**822 Penazetidine A**

3-Hydroxy-4-(12-methyloctadecyl)-2-azetidinemethanol **Type:** Sphingolipids.  $C_{23}H_{47}NO_2$   $[\alpha]_D = -16.9^\circ$  ( $c = 0.04$ , MeOH). **Source:** Sponge *Penares sollasi* (Indo-Pacific). **Pharm:** PKC inhibitor ( $IC_{50} = 1 \mu\text{mol/L}$ ); cytotoxic (A549, HT29, B16-F-10 and P<sub>388</sub>). **Ref:** K. A. Alvi, et al, BoMCL, 1994, 4, 2447 | A. Yajima, et al, Liebigs Ann. Chem., 1996, 1083 | D. Skropeta, et al, Mar. Drugs, 2011, 9, 2131 (rev)

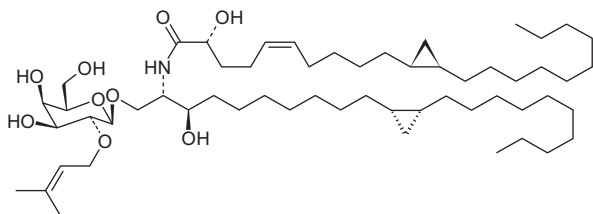
**823 N-(Pentacosanoyl)-2-amino-9-methyl-4-octadecene-1,3-diol**

**Type:** Sphingolipids.  $C_{44}H_{87}NO_3$  **Source:** Sponge *Haliclona* sp. (Jjddah, Saudi Arabia). **Pharm:** Cytotoxic (normal fibroblast line NIH3T3,  $IC_{50} = 20 \mu\text{mol/L}$ ; virally transformed form KA3IT,  $IC_{50} = 10 \mu\text{mol/L}$ ). **Ref:** S. -E. N. Ayyad, et al, Nat. Prod. Res., 2009, 23, 44

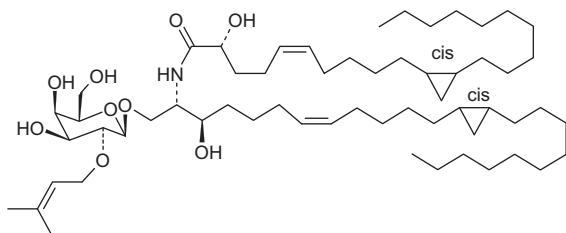


**824 Plakoside A**

**Type:** Sphingolipids.  $C_{57}H_{105}NO_9$  Amorph. solid,  $[\alpha]_D^{25} = +7^\circ$  ( $c = 0.5$ , MeOH).  
**Source:** Sponge *Plakortis simplex* (Bahamas). **Pharm:** Immunosuppressive (activated T cells, significantly inhibited proliferative response of lymph node cells to  $0.5 \mu\text{g/mL}$  Con A at all doses  $0.01\text{--}10 \mu\text{g/mL}$ ,  $IP_{50} \approx 0.1 \mu\text{g/mL}$ ). **Ref:** V. Costantino, et al, JACS, 1997, 119, 12465 | M. Seki, et al, Tet. Lett., 2001, 42, 2357 | M. Seki, et al, EurJOC, 2001, 3797

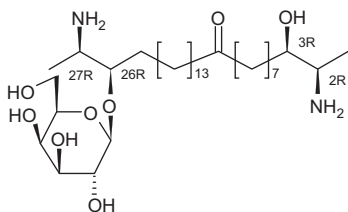
**825 Plakoside B**

**Type:** Sphingolipids.  $C_{59}H_{107}NO_9$  Amorph. solid,  $[\alpha]_D^{25} = +7^\circ$  ( $c = 0.2$ , MeOH).  
**Source:** Sponge *Plakortis simplex* (Bahamas). **Pharm:** Immunosuppressive (activated T cells, significantly inhibited proliferative response of lymph node cells to  $0.5 \mu\text{g/mL}$  Con A at all doses  $0.01\text{--}10 \mu\text{g/mL}$ ,  $IP_{50} \approx 0.05 \mu\text{g/mL}$ ). **Ref:** V. Costantino, et al, JACS, 1997, 119, 12465

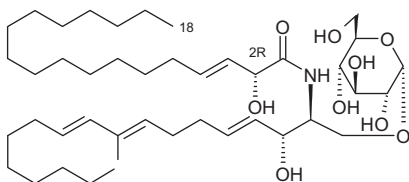
**826 Rhizochalin**

**Type:** Sphingolipids.  $C_{34}H_{68}N_2O_8$  Cryst. (EtOH/EtOAc), mp  $124\text{--}126^\circ\text{C}$ ,  $[\alpha]_{578.00} = -5^\circ$ .  
**Source:** Sponges *Oceanapia ramsayi* and *Rhizochalina incrustata*. **Pharm:** Antibacterial; cytotoxic. **Ref:** T. N. Makarieva, et al, Tet. Lett., 1989, 30, 6581 | J. Bensemhoun, et al, Molecules, 2008, 13, 772

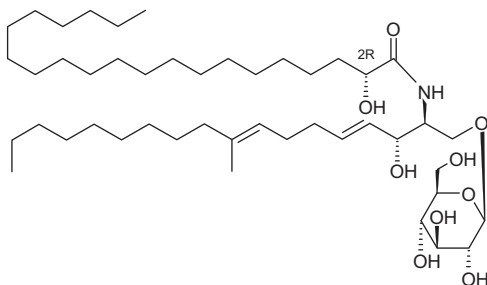


**827 Sarcocochrenolide A**

*N*-(2*R*-Hydroxy-3*E*-octadecenoyl)-(2*S*,3*R*,4*E*,8*E*,10*E*)-2-amino-9-methyl-4,8,10-octadecatriene-1,3-diol 1-*O*- $\alpha$ -*D*-glucopyranoside Type: Sphingolipids.  $C_{43}H_{77}NO_9$ , Amorph. powder,  $[\alpha]_D^{23} = +77^\circ$  ( $c = 0.2$ , MeOH). Source: Soft coral *Sarcophyton ehrenbergi*. Pharm: Anti-inflammatory; reducer of iNOS expression (murine macrophage cell line). Ref: S. -Y. Cheng, et al, JNP, 2009, 72, 465

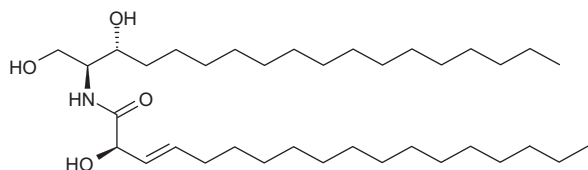
**828 Sarcocochrenolide B**

Type: Sphingolipids.  $C_{46}H_{87}NO_9$ , Amorph. powder,  $[\alpha]_D^{23} = +51.3^\circ$  ( $c = 0.3$ , MeOH). Source: Soft coral *Sarcophyton ehrenbergi* (Dongsha Is., South China waters Sea). Pharm: Reducer of iNOS expression (murine macrophage cell line). Ref: S. -Y. Cheng, et al, JNP, 2009, 72, 465

**829 Symbioramide**

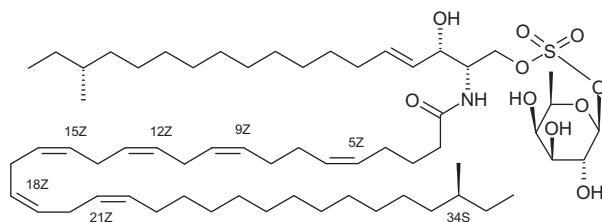
Type: Sphingolipids.  $C_{36}H_{71}NO_4$  Cryst., mp 105–107 °C,  $[\alpha]_D^{22} = +5.8^\circ$  ( $c = 1$ ,  $CHCl_3$ ). Source: Cyanobacterium *Oscillatoria crythraea* (Queensland), dinoflagellate *Symbiodinium* sp. from an unidentified bivalve. Pharm: Calcium ATPase activator; ion channel activator; toxin (ciguatoxin-like). Ref: C. B. Rao, et al, JACS, 1984, 106, 7983 | J. Kobayashi, et al, Experientia, 1988, 44, 800 | M. Nakagawa, et al, Chem.

Lettr., 1990, 1407 | S. T. Hahn, et al, Food Additives and Contaminants, 1992, 9, 351 | K. Mori, et al, Liebigs Ann. Chem., 1994, 41



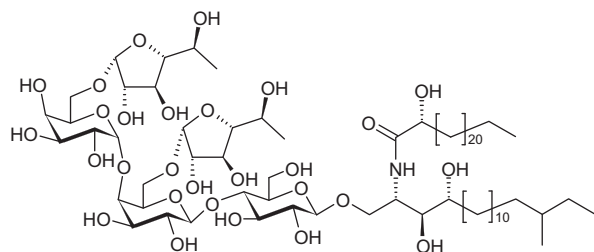
### 830 Syriacin

*N*-(34*S*-Methyl-5*Z*,9*Z*,12*Z*,15*Z*,18*Z*,21*Z*-hexatriacontahexaenoyl)-(2*S*,3*S*,4*E*,16*R*)-2-amino-16-methyl-4-octadecene-1,3-diol 1-*O*- $\beta$ -*D*-fucopyranosyloxysulfonoside Type: Sphingolipids.  $C_{62}H_{109}NO_{10}S$  Powder,  $[\alpha]_D^{23} = -18.3^\circ$  ( $c = 0.04$ , MeOH). Source: Sponge *Ephydatia syriaca* (freshwater). Pharm: Antifeedant (fish). Ref: T. Rezanza, et al, Tetrahedron, 2006, 62, 5937



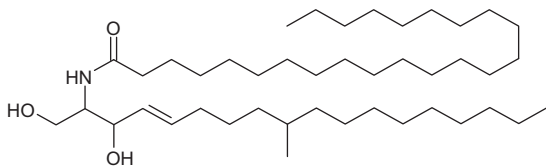
### 831 Terpioside B

Type: Sphingolipids.  $C_{12}H_{25}NO_4$  Colorless amorph. solid. Source: Sponge *Terpios* sp. (Key Largo, Florida). Pharm: LPS-induced NO release inhibitor (potent). Ref: V. Costantino, et al, BoMC, 2010, 18, 5310

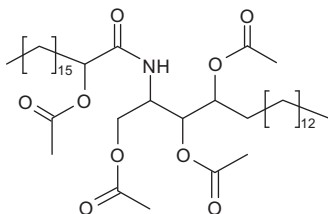


### 832 *N*-(Tetracosanoyl)-2-amino-9-methyl-4-octadecene-1,3-diol

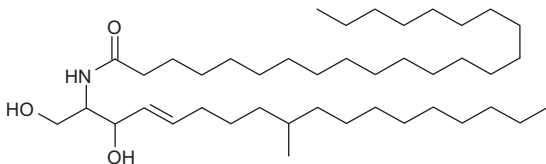
Type: Sphingolipids.  $C_{43}H_{85}NO_3$  Source: Sponge *Haliclona* sp. (Jiddah, Saudi Arabia). Pharm: Cytotoxic (normal fibroblast line NIH3T3,  $IC_{50} = 20 \mu\text{mol/L}$ ; virally transformed form KA3IT,  $IC_{50} = 10 \mu\text{mol/L}$ ). Ref: S. -E. N. Ayyad, et al, Nat. Prod. Res., 2009, 23, 44

**833 (2S,3S,4R)-1,3,4-Triacetoxy-2-[(R)-2'-acetyloctadecanoyl]amino]octadecane**

**Type:** Sphingolipids.  $C_{44}H_{81}NO_9$ , mp 54–57 °C,  $[\alpha]_D^{28} = +8^\circ$  ( $c = 0.1$ ,  $CHCl_3$ ). **Source:** Soft coral *Simularia leptoclados* (Southern India). **Pharm:** Antibacterial (gram-negative bacteria, MIC = 200  $\mu\text{g/mL}$ ). **Ref:** G. B. S. Reddy, et al, CPB, 1999, 47, 1214

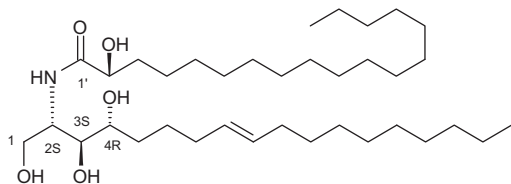
**834 N-(Tricosanoyl)-2-amino-9-methyl-4-octadecene-1,3-diol**

**Type:** Sphingolipids.  $C_{42}H_{83}NO_3$  **Source:** Sponge *Haliclona* sp. (Jjddah, Saudi Arabia). **Pharm:** Cytotoxic (normal fibroblast line NIH3T3,  $IC_{50} = 20 \mu\text{mol/L}$ ; virally transformed form KA3IT,  $IC_{50} = 10 \mu\text{mol/L}$ ). **Ref:** S. -E. N. Ayyad, et al, Nat. Prod. Res., 2009, 23, 44

**835 (2S,3S,4R)-1,3,4-Trihydroxy-2-[(R)-hydroxyoctadecanoyl]amino]octadec-8E-ene**

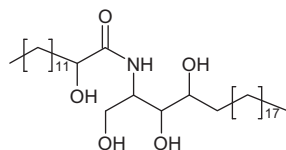
**Type:** Sphingolipids.  $C_{36}H_{71}NO_5$  Cryst. ( $CHCl_3/MeOH$ ), mp 128–130 °C. **Source:** Soft coral *Simularia grandilobata* (Andaman Is., Indian Ocean). **Pharm:** Antibacterial (*Escherichia coli*, 50  $\mu\text{g/mL}$ , IZD = 11 mm, 100  $\mu\text{g/mL}$ , IZD = 12 mm, 200  $\mu\text{g/mL}$ , IZD = 15 mm; *Bacillus subtilis*, 50  $\mu\text{g/mL}$ , IZD = 12 mm, 100  $\mu\text{g/mL}$ , IZD = 13 mm, 200  $\mu\text{g/mL}$ , IZD = 16 mm; *Bacillus pumilus*, 50  $\mu\text{g/mL}$ , IZD = 11 mm, 100  $\mu\text{g/mL}$ , IZD = 14 mm, 200  $\mu\text{g/mL}$ , IZD = 16 mm); antifungal (*Pseudomonas aeruginosa*, 50  $\mu\text{g/mL}$ , IZD = 11 mm, 100  $\mu\text{g/mL}$ , IZD = 13 mm, 200  $\mu\text{g/mL}$ , IZD = 14 mm; *Aspergillus niger*, 50  $\mu\text{g/mL}$ , IZD = 10 mm, 100  $\mu\text{g/mL}$ , IZD = 13 mm, 200  $\mu\text{g/mL}$ , IZD = 15 mm; *Rhizopus oryzae*, 50  $\mu\text{g/mL}$ , IZD = 10 mm, 100  $\mu\text{g/mL}$ , IZD = 13 mm,

200 µg/mL, IZD = 14 mm; yeast *Candida albicans*, 50 µg/mL, IZD = 11 mm, 100 µg/mL, IZD = 13 mm, 200 µg/mL, IZD = 16 mm). Ref: A. S. Dmitrenok, et al, Russ. Chem. Bull., 2003, 52, 1868



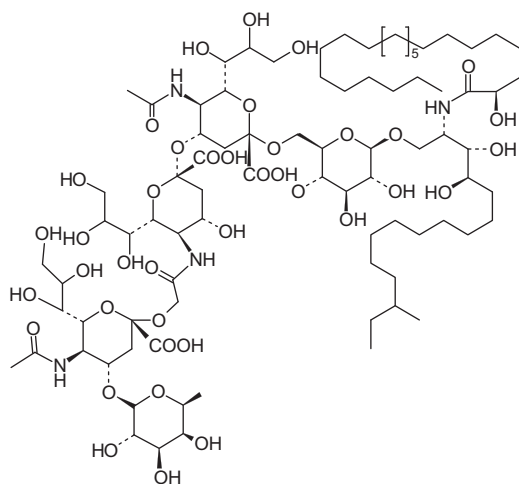
### 836 (2S,3S,4R)-1,3,4-Trihydroxy-2-[(R)-2'-hydroxytetradecanoyl]amino]tricosane

Type: Sphingolipids.  $C_{37}H_{75}NO_5$  Amorph. powder, mp 105–107 °C,  $[\alpha]_D^{28} = +7.0^\circ$  ( $c = 0.1$ ,  $CHCl_3$ ). Source: Soft coral *Sinularia leptoclados* (Southern India). Pharm: Antibacterial (gram-negative bacteria, MIC = 200 µg/mL). Ref: G. B. S. Reddy, et al, CPB, 1999, 47, 1214



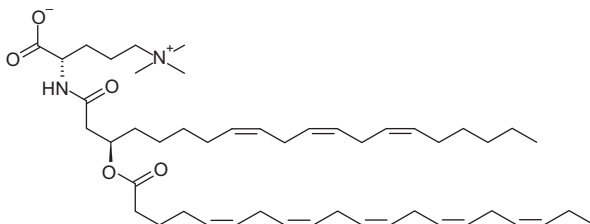
### 837 Trisialo-ganglioside HPG-1

Type: Sphingolipids.  $C_{84}H_{150}N_4O_{39}$  Amorph. powder, mp 261–270 °C. Source: Sea cucumber *Holothuria pervicax* (Japan waters). Pharm: Neuritogenic (rat pheochromocytoma cell line PC-12). Ref: K. Yamada, et al, CPB, 2000, 48, 157

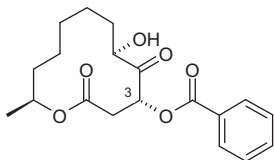


**838 Yendolipin**

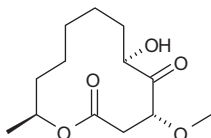
**Type:** Sphingolipids.  $C_{48}H_{78}N_2O_5$  Pale yellow oil,  $[\alpha]_D^{25} = +6.69^\circ$  ( $c = 1.0$ ,  $CHCl_3$ ).  
**Source:** Red alga *Neodilsea yendoana* (Hokkaido, Japan). **Pharm:** Inhibits morphogenesis of foliaceous green alga *Monostroma oxyspermum*. **Ref:** R. Ishida, et al, Chem. Lett., 1994, 2427

**1.14 Pandangolide and Sporiolide Cyclic Lactones****839 Sporiolide A**

**Type:** Pandangolide and sporiolide cyclic lactones.  $C_{19}H_{24}O_6$  Amorph. solid,  $[\alpha]_D^{25} = -14^\circ$  ( $c = 0.2$ , MeOH). **Source:** Marine-derived fungus *Cladosporium* sp. (cultured broth) from brown alga *Actinotrichia fragilis* (Okinawa). **Pharm:** Cytotoxic ( $L_{1210}$ ); antifungal (*Cryptococcus neoformans* and *Neurospora crassa*). **Ref:** H. Shigemori, et al, Mar. Drugs, 2004, 2, 164 | M. Saleem, et al, NPR, 2007, 24, 1142 (rev)

**840 Sporiolide B**

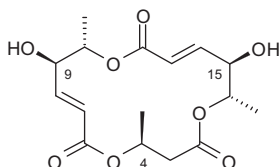
**Type:** Pandangolide and sporiolide cyclic lactones.  $C_{13}H_{22}O_5$  Amorph. solid,  $[\alpha]_D^{25} = -33^\circ$  ( $c = 0.3$ , MeOH). **Source:** Marine-derived fungus *Cladosporium* sp. (cultured broth) from brown alga *Actinotrichia fragilis* (Okinawa). **Pharm:** Cytotoxic ( $L_{1210}$ ). **Ref:** H. Shigemori, et al, Mar. Drugs, 2004, 2, 164 | M. Saleem, et al, NPR, 2007, 24, 1142 (rev)



## 1.15 Macrospinelide Cyclic Tri-lactones

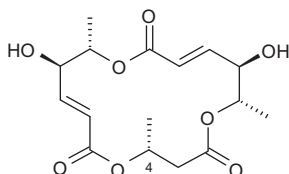
### 841 Macrospinelide A

**Type:** Macrospinelide cyclic tri-lactones.  $C_{16}H_{22}O_8$  Needles, mp 141–142 °C,  $[\alpha]_D^{23} = +84.1^\circ$  ( $c = 0.6$ , MeOH). **Source:** Marine-derived fungus *Microspheeropsis* sp. FO-5050. **Pharm:** Cell-cell adhesion inhibitor; Antimetastatic agent. **Ref:** M. Hayashi, et al, J. Antibiot., 1995, 48, 1435 | S. Takamatsu, et al, J. Antibiot., 1996, 49, 95; 1997, 50, 878



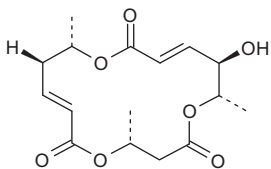
### 842 Macrospinelide E

**Type:** Macrospinelide cyclic tri-lactones.  $C_{16}H_{22}O_8$  Colorless oil,  $[\alpha]_D^{22} = +78.5^\circ$  ( $c = 0.21$ , EtOH);  $[\alpha]_D = +56.8^\circ$  ( $c = 0.46$ , EtOH). **Source:** Marine-derived fungus *Periconia byssoides* OUPS-N133 from sea hare *Aplysia kurodai* (gastrointestinal tract). **Pharm:** Cytotoxic ( $P_{388}$ ,  $ED_{50} > 100 \mu\text{g/mL}$ ); inhibits adhesion of HL60 cells to hmn umbilical vein endothelial cells (HUVEC). **Ref:** A. Numata, et al, Tet. Lett., 1997, 38, 8215 | M. Ono, et al, Tetrahedron: Asymmetry, 2000, 11, 2753 | T. Yamada, et al, JCS Perkin I, 2001, 3046



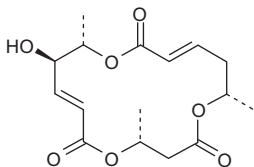
### 843 Macrospinelide F

**Type:** Macrospinelide cyclic tri-lactones.  $C_{16}H_{22}O_7$  Oil,  $[\alpha]_D = +23.3^\circ$  ( $c = 0.09$ , MeOH). **Source:** Marine-derived fungus *Periconia byssoides* OUPS-N133 from sea hare *Aplysia kurodai* (gastrointestinal tract). **Pharm:** Cytotoxic; inhibits adhesion of HL60 cells to hmn umbilical vein endothelial cells (HUVEC). **Ref:** A. Numata, et al, Tet. Lett., 1997, 38, 8215 | T. Yamada, et al, JCS Perkin I, 2001, 3046



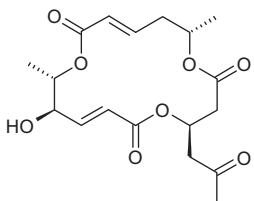
#### 844 Macrospheptide G

**Type:** Macrospheptide cyclic tri-lactones.  $C_{16}H_{22}O_7$  Oil,  $[\alpha]_D = +66.7^\circ$  ( $c = 0.5$ , EtOH). **Source:** Marine-derived fungus *Periconia byssoides* OUPS-N133 from sea hare *Aplysia kurodai* (gastrointestinal tract). **Pharm:** Cytotoxic; inhibits adhesion of HL60 cells to hmn umbilical vein endothelial cells (HUVEC). **Ref:** A. Numata, et al, Tet. Lett., 1997, 38, 8215 | T. Yamada, et al, JCS Perkin I, 2001, 3046



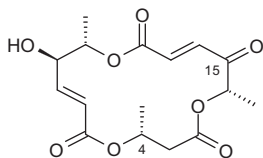
#### 845 Macrospheptide H

**Type:** Macrospheptide cyclic tri-lactones.  $C_{18}H_{24}O_8$  Oil,  $[\alpha]_D = +41.7^\circ$  ( $c = 0.22$ , EtOH). **Source:** Marine-derived fungus *Periconia byssoides* OUPS-N133 from sea hare *Aplysia kurodai* (gastrointestinal tract). **Pharm:** Cytotoxic; Immune system activity (cell adhesion inhibitor, inhibits adhesion of HL60 cells to hmn umbilical vein endothelial cells (HUVEC)). **Ref:** A. Numata, et al, Tet. Lett., 1997, 38, 8215 | T. Yamada, et al, JCS Perkin I, 2001, 3046 | T. Yamada, et al, J. Antibiot., 2002, 55, 147



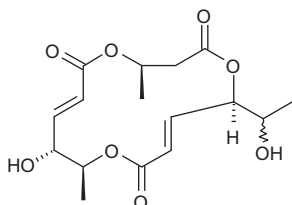
#### 846 Macrospheptide L

**Type:** Macrospheptide cyclic tri-lactones.  $C_{16}H_{20}O_8$  Oil,  $[\alpha]_D^{21} = -24.2^\circ$  ( $c = 0.33$ , EtOH). **Source:** Marine-derived fungus *Periconia byssoides* OUPS-N133 from sea hare *Aplysia kurodai* (gastrointestinal tract). **Pharm:** Cell-cell adhesion inhibitor. **Ref:** T. Yamada, et al, J. Antibiot., 2002, 55, 147



### 847 Macrospheptide M

**Type:** Macrospheptide cyclic tri-lactones.  $C_{16}H_{22}O_8$  Pale yellow oil,  $[\alpha]_D^{22} = +5.5^\circ$  ( $c = 0.3$ , EtOH). **Source:** Marine-derived fungus *Periconia byssoides* OUPS-N133. **Pharm:** Immune system activity (cell adhesion inhibitor,  $IC_{50} = 33.2 \mu\text{mol/L}$ ). **Ref:** T. Yamada, et al, J. Antibiot., 2007, 60, 370

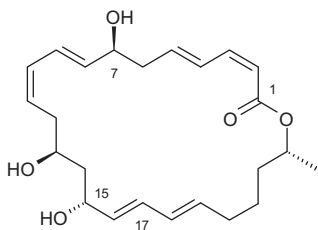


## 1.16 Macrolactin Cyclic Lactones

### 848 Macrolactin A

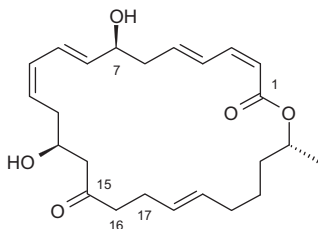
**Type:** Macrolactin cyclic lactones.  $C_{24}H_{34}O_5$  Plates (EtOAc/2,3,3-trimethylpentane), mp 75–78 °C,  $[\alpha]_D = -9.6^\circ$  ( $c = 1.86$ , MeOH). **Source:** An unidentified marine bacterium (psychrophilic, cold water, gram-positive, slurry of sterile seawater and sediment, depth of 980 m sediment core, Northern Pacific Ocean). an unidentified marine bacterium (deep water), marine bacterium *Bacillus marinus*. **Pharm:** Antibacterial (standard agar plate-assay disk methods, *Bacillus subtilis*, 5  $\mu\text{g/disk}$ ; *Staphylococcus aureus*, 20  $\mu\text{g/disk}$ ); cytotoxic (B16-F-10,  $IC_{50} = 3.5 \mu\text{g/mL}$ ); cytotoxic (Hep2 and MA-104 carrier cell lines); antiviral (HSV-1,  $IC_{50} = 5.0 \mu\text{g/mL}$ ; HSV-2,  $IC_{50} = 8.3 \mu\text{g/mL}$ ); T-lymphoblast cell protectant (against hmn HIV viral replication, 10  $\mu\text{g/mL}$ ); neuronal cell protectant. **Ref:** K. Gustafson, et al, JACS, 1989 111, 7519; 1992, 114, 671 | Y. Kim, et al, Angew. Chem., Int. Ed., 1998, 37, 1261 | C. Jaruchoktaweethai, et al, JNP, 2000, 63, 984 | M. D. Lebar, et al, NPR, 2007, 24, 774 (rev)





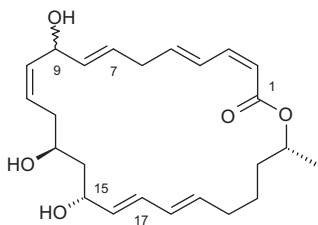
### 849 Macrolactin F

**Type:** Macrolactin cyclic lactones.  $C_{24}H_{34}O_8$   $[\alpha]_D = -30.1^\circ$  ( $c = 1.31$ , MeOH). **Source:** An unidentified marine bacterium (psychrophilic, cold water, gram-positive, slurry of sterile seawater and sediment, depth of 980 m sediment core, Northern Pacific Ocean). **Pharm:** Antibacterial. **Ref:** K. Gustafson, et al, JACS, 1989 111, 7519; 1992, 114, 671 | C. Jaruchoktaweetchai, et al, JNP, 2000, 63, 984 | M. D. Lebar, et al, NPR, 2007, 24, 774 (rev)



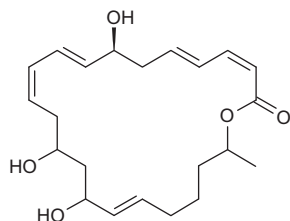
### 850 Macrolactin G

**Type:** Macrolactin cyclic lactones.  $C_{24}H_{34}O_5$   $[\alpha]_D^{25} = -109.1^\circ$  ( $c = 0.03$ , MeOH). **Source:** Marine-derived bacterium *Bacillus* sp. PP19-H3 from red alga *Schizymenia dubyi*. **Pharm:** Antimicrobial (selective). **Ref:** K. Gustafson, et al, JACS, 1989, 111, 7519 | T. Nagao, et al, J. Antibiot., 2001, 54, 333



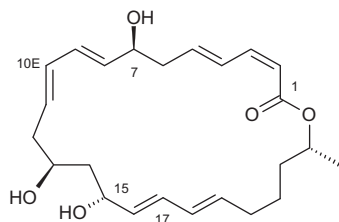
### 851 Macrolactin H

**Type:** Macrolactin cyclic lactones.  $C_{22}H_{32}O_5$   $[\alpha]_D^{25} = -92.2^\circ$  ( $c = 0.06$ , MeOH). **Source:** Marine-derived bacterium *Bacillus* sp. PP19-H3 (culture broth) from red alga *Schizymenia dubyi*. **Pharm:** Antimicrobial (selective). **Ref:** T. Nagao, et al, J. Antibiot., 2001, 54, 333



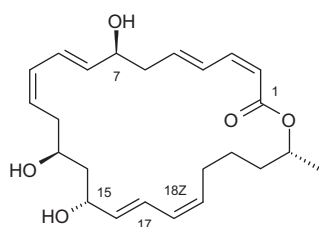
### 852 Macrolactin I

**Type:** Macrolactin cyclic lactones.  $C_{24}H_{34}O_5$   $[\alpha]_D = -137.7^\circ$  ( $c = 0.17$ , MeOH). **Source:** Marine-derived bacterium *Bacillus* sp. PP19-H3 from red alga *Schizymenia dubyi*. **Pharm:** Antimicrobial (selective). **Ref:** K. Gustafson, et al, JACS, 1989, 111, 7519 | T. Nagao, et al, J. Antibiot., 2001, 54, 333



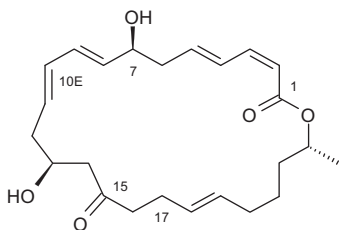
### 853 Macrolactin J

**Type:** Macrolactin cyclic lactones.  $C_{24}H_{34}O_5$   $[\alpha]_D^{25} = -85.5^\circ$  ( $c = 0.08$ , MeOH). **Source:** Marine-derived bacterium *Bacillus* sp. PP19-H3 from red alga *Schizymenia dubyi*. **Pharm:** Antimicrobial (selective). **Ref:** K. Gustafson, et al, JACS, 1989, 111, 7519 | T. Nagao, et al, J. Antibiot., 2001, 54, 333



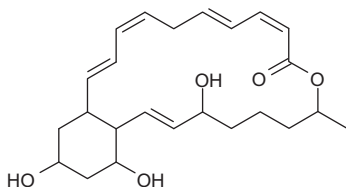
### 854 Macrolactin K

**Type:** Macrolactin cyclic lactones.  $C_{24}H_{34}O_5$   $[\alpha]_D^{25} = -169.8^\circ$  ( $c = 0.11$ , MeOH). **Source:** Marine-derived bacterium *Bacillus* sp. PP19-H3 from red alga *Schizymenia dubyi*. **Pharm:** Antimicrobial (selective). **Ref:** K. Gustafson, et al, JACS, 1989, 111, 7519 | T. Nagao, et al, J. Antibiot., 2001, 54, 333



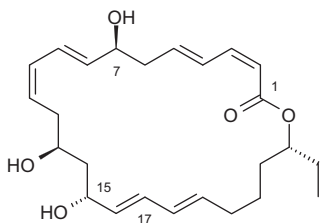
### 855 Macrolactin L

**Type:** Macrolactin cyclic lactones.  $C_{24}H_{34}O_5$   $[\alpha]_D^{25} = -139.5^\circ$  ( $c = 0.04$ , MeOH). **Source:** Marine-derived bacterium *Bacillus* sp. PP19-H3 (culture broth) from red alga *Schizymenia dubyi*. **Pharm:** Antimicrobial (selective). **Ref:** T. Nagao, et al, J. Antibiot., 2001, 54, 333



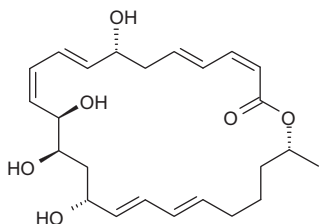
### 856 Macrolactin M

**Type:** Macrolactin cyclic lactones.  $C_{25}H_{36}O_5$   $[\alpha]_D^{25} = -43.2^\circ$  ( $c = 0.04$ , MeOH). **Source:** Marine-derived bacterium *Bacillus* sp. PP19-H3 from red alga *Schizymenia dubyi*. **Pharm:** Antimicrobial (selective). **Ref:** K. Gustafson, et al, JACS, 1989, 111, 7519 | Japan. Pat., 1997, 97 301 970; CA, 128, 74381h | T. Nagao, et al, J. Antibiot., 2001, 54, 333

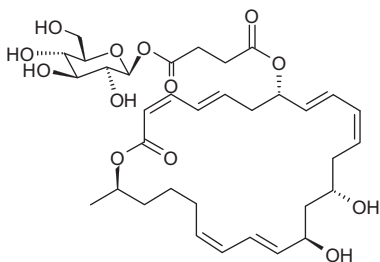


### 857 Macrolactin V

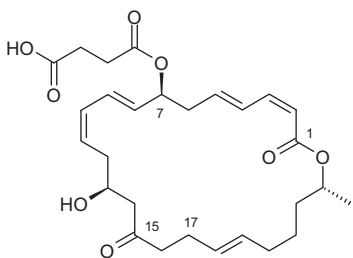
**Type:** Macrolactin cyclic lactones.  $C_{24}H_{34}O_6$  **Source:** Marine-derived bacterium *Bacillus amyloliquefaciens* from gorgonian *Junceella juncea* (Sanya, Hainan, China waters). **Pharm:** Antibacterial (strong). **Ref:** E. Klarmann, et al, JACS, 1932, 54, 298

**858 Macrolactin W**

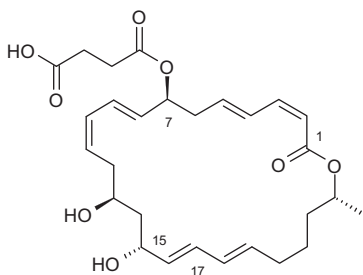
**Type:** Macrolactin cyclic lactones.  $C_{34}H_{48}O_{13}$  **Source:** Marine-derived bacterium *Bacillus* sp. (sediment, Ieodo, R. O. Korea). **Pharm:** Antibacterial (gram-positive and -negative bacteria, potent). **Ref:** M. A. M. Mondol, et al, BoMCL, 2011, 21, 3832

**859 7-O-Succinoylmacrolactin F**

**Type:** Macrolactin cyclic lactones.  $C_{28}H_{38}O_8$  Amorph. solid,  $[\alpha]_D^{25} = -24.4^\circ$  ( $c = 0.5$ , MeOH). **Source:** Marine-derived bacterium *Bacillus* sp. Sc026 (from marine sediment). **Pharm:** Antibacterial (*Bacillus subtilis* and *Staphylococcus aureus*). **Ref:** C. Jaruchoktaweewchai, et al, JNP, 2000, 63, 984

**860 7-O-Succinylmacrolactin A**

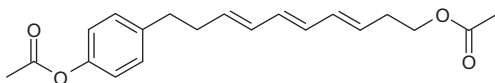
**Type:** Macrolactin cyclic lactones.  $C_{28}H_{38}O_8$  Amorph. solid,  $[\alpha]_D^{25} = -9.6^\circ$  ( $c = 0.18$ , MeOH). **Source:** Marine-derived bacterium *Bacillus* sp. Sc026 (from marine sediment). **Pharm:** Antibacterial (*Bacillus subtilis* and *Staphylococcus aureus*). **Ref:** C. Jaruchoktaweewchai, et al, JNP, 2000, 63, 984



## 1.17 Long-chain Aromatic Systems

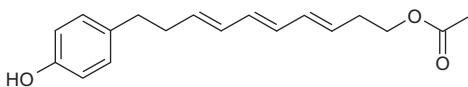
### 861 1-Acetoxy-4-(10-acetoxy-3,5,7-decatrienyl)benzene

**Type:** Long-chain aromatic systems.  $C_{20}H_{24}O_4$  **Source:** Cephalaspid *Haminoea callidigenita* (Mediterranean Sea). **Pharm:** Alarm pheromone (structure and anatomical location strongly support its potential defensive role as alarm pheromone); cytotoxic; antibacterial; DNA strand scission activity. **Ref:** A. Spinella, et al, Tet. Lett., 1998, 39, 2005 | I. Izzo, et al, Tet. Lett., 2000, 41, 3975



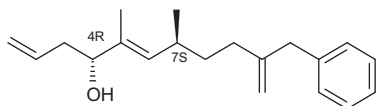
### 862 4-(10-Acetoxy-3,5,7-decatrienyl)phenol

**Type:** Long-chain aromatic systems.  $C_{18}H_{22}O_3$  **Source:** Cephalaspid *Haminoea callidigenita* (Mediterranean Sea). **Pharm:** Alarm pheromone (structure and anatomical location strongly support its potential defensive role as alarm pheromone); cytotoxic; antibacterial; DNA strand scission activity. **Ref:** A. Spinella, et al, Tet. Lett., 1998, 39, 2005 | I. Izzo, et al, Tet. Lett., 2000, 41, 3975

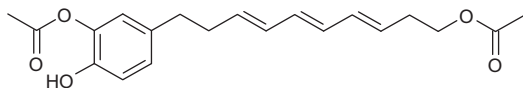


### 863 (4R,7S,E)-10-Benzyl-5,7-dimethylundeca-1,5,10-trien-4-ol

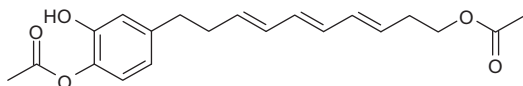
**Type:** Long-chain aromatic systems.  $C_{20}H_{28}O$  Colorless oil. **Source:** Sponges *Smenospongia aurea*, *Smenospongia cerebriformis*, and *Verongula rigida* (mixture of three sponges, Florida). **Pharm:** Cytotoxic (HL60 hmn leukemia cells,  $IC_{50} = 8.1 \mu\text{mol/L}$ , matches pharmacophore of eribulin through inhibition of microtubule activity). **Ref:** I. H. Hwang, et al, Tet. Lett., 2013, 54, 3872

**864 10-(3,4-Dihydroxyphenyl)-3,5,7-decatrien-1-ol 1,3'-diacetate**

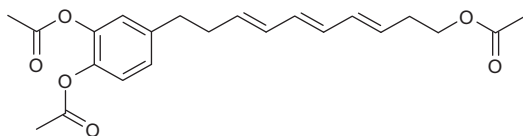
**Type:** Long-chain aromatic systems.  $C_{20}H_{24}O_5$  **Source:** Cephalaspid *Haminoea callidegenita* (Mediterranean Sea). **Pharm:** Alarm pheromone (structure and anatomical location strongly support its potential defensive role as alarm pheromone); cytotoxic; antibacterial; DNA strand scission activity. **Ref:** A. Spinella, et al, Tet. Lett., 1998, 39, 2005 | I. Izzo, et al, Tet. Lett., 2000, 41, 3975

**865 10-(3,4-Dihydroxyphenyl)-3,5,7-decatrien-1-ol 1,4'-diacetate**

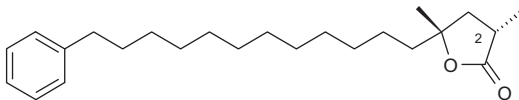
**Type:** Long-chain aromatic systems.  $C_{20}H_{24}O_5$  **Source:** Cephalaspid *Haminoea callidegenita* (Mediterranean Sea). **Pharm:** Alarm pheromone (structure and anatomical location strongly support its potential defensive role as alarm pheromone); cytotoxic; antibacterial; DNA strand scission activity. **Ref:** A. Spinella, et al, Tet. Lett., 1998, 39, 2005 | I. Izzo, et al, Tet. Lett., 2000, 41, 3975

**866 10-(3,4-Dihydroxyphenyl)-3,5,7-decatrien-1-ol triacetate**

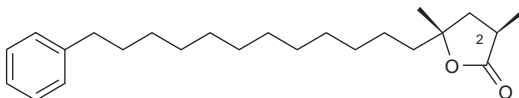
**Type:** Long-chain aromatic systems.  $C_{22}H_{26}O_6$  **Source:** Cephalaspid *Haminoea callidegenita* (Mediterranean Sea). **Pharm:** Alarm pheromone (structure and anatomical location strongly support its potential defensive role as alarm pheromone); cytotoxic; antibacterial; DNA strand scission activity. **Ref:** A. Spinella, et al, Tet. Lett., 1998, 39, 2005 | I. Izzo, et al, Tet. Lett., 2000, 41, 3975

**867 (2S\*,4R\*)-2,4-Dimethyl-4-hydroxy-16-phenylhexadecanoic acid 1,4-lactone**

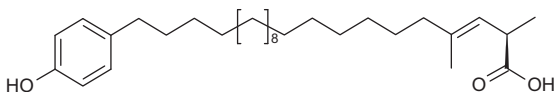
**Type:** Long-chain aromatic systems.  $C_{24}H_{38}O_2$  Oil,  $[\alpha]_D = -7.1^\circ$  ( $c = 0.13$ , MeOH). **Source:** Sponge *Plakortis nigra* (Palau, Oceania, depth of 380 ft). **Pharm:** Cytotoxic (HCT116,  $IC_{50} = 14.5 \mu\text{mol/L}$ ). **Ref:** J. S. Sandler, et al, JNP, 2002, 65, 1258

**868 (2R\*,4R\*)-2,4-Dimethyl-4-hydroxy-16-phenylhexadecanoic acid 1,4-lactone**

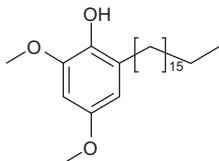
**Type:** Long-chain aromatic systems.  $C_{24}H_{38}O_2$  Oil,  $[\alpha]_D = +19.3^\circ$  ( $c = 0.05$ , MeOH).  
**Source:** Sponge *Plakortis nigra* (Palau, Oceania, depth of 380 ft). **Pharm:** Cytotoxic (HCT116, mild). **Ref:** J. S. Sandler, et al, JNP, 2002, 65, 1258

**869 Elenic acid**

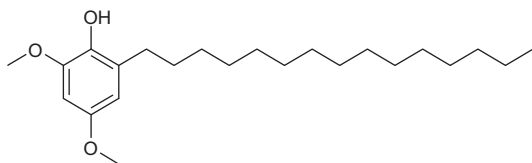
*R*-2,4-Dimethyl-22-(*p*-hydroxyphenyl)-docos-3(*E*)-enoic acid **Type:** Long-chain aromatic systems.  $C_{30}H_{50}O_3$  Amorph. powder,  $[\alpha]_D = -27.2^\circ$  ( $c = 2.2$ ,  $CHCl_3$ ). **Source:** Sponges *Plakortis* spp. and *Plakinastrella* sp. (Indonesia). **Pharm:** Cytotoxic ( $P_{388}$ , A549 and MEL28,  $IC_{50} = 5 \mu\text{g/mL}$ ); topoisomerase II inhibitor ( $IC_{50} = 0.1 \mu\text{g/mL}$ ). **Ref:** E. G. Juagdan, et al, Tet. Lett., 1995, 36, 2905 | S. Takanashi, et al, JCS Perkin I, 1998, 1603 | R. C. Hoye, et al, JOC, 1999, 64, 2450

**870 Hierridin A**

**Type:** Long-chain aromatic systems.  $C_{25}H_{44}O_3$  Cryst. (MeOH), mp 77.7–79.1 °C, mp 74.8–77.3 °C. **Source:** Cyanobacterium *Phormidium ectocarpi*. **Pharm:** Antiplasmodial (mixture with Hierridin B, CRPF,  $IC_{50} = 5.2 \mu\text{g/mL}$ ); antioxidant. **Ref:** O. Papendorf, et al, Phytochemistry, 1998, 49, 2383

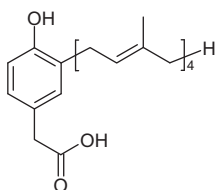
**871 Hierridin B**

7*H*-Indolo[3,2-*j*]phenanthridine-7,13(12*H*)-dione **Type:** Long-chain aromatic systems.  $C_{23}H_{40}O_3$  **Source:** Cyanobacterium *Phormidium ectocarpi*. **Pharm:** Antiplasmodial (mixture with Hierridin A, CRPF,  $IC_{50} = 5.2 \mu\text{g/mL}$ ). **Ref:** O. Papendorf, et al, Phytochemistry, 1998, 49, 2383



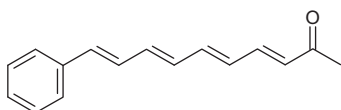
### 872 2-(4-Hydroxy-3-tetraprenyl)-acetic acid

**Type:** Long-chain aromatic systems.  $C_{28}H_{40}O_3$  Oil. **Source:** Sponge *Ircinia muscarum*. **Pharm:** Topoisomerase II inhibitor. **Ref:** J. P. Baz, et al, JNP, 1996, 59, 960



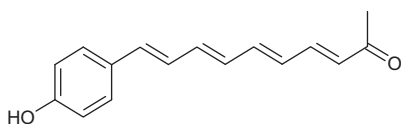
### 873 Navenone B

**Type:** Long-chain aromatic systems.  $C_{16}H_{16}O$  Cryst. ( $CH_2Cl_2$ ), mp 125–140 °C. **Source:** Cephalaspids *Navanax inermis* and *Haminoea navicula*. **Pharm:** Alarm pheromone. **Ref:** H. L. Sleeper, et al, JACS, 1977, 99, 2367 | W. Fenical, et al, Pure Appl. Chem., 1979, 51, 1865 | G. Cimino, et al, Experientia, 1991, 47, 61 | A. Spinella, et al, Tetrahedron, 1993, 49, 1307 | D. Soullez, et al, Nat. Prod. Lett., 1994, 4, 203 | R. Alvarez, et al, Tetrahedron: Asymmetry, 1998, 9, 3065 | R. Alvarez, et al, Tetrahedron, 1998, 54, 6793



### 874 Navenone C

**Type:** Long-chain aromatic systems.  $C_{16}H_{16}O_2$  **Source:** Cephalaspid *Navanax inermis*. **Pharm:** Alarm pheromone. **Ref:** H. L. Sleeper, et al, JACS, 1977, 99, 2367 | D. Soullez, et al, Nat. Prod. Lett., 1994, 4, 203

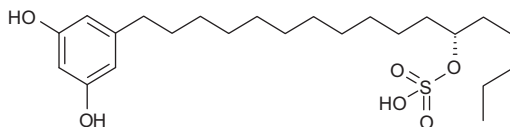


### 875 5-(12-Sulfooxyheptadecyl)-1,3-benzenediol

**Type:** Long-chain aromatic systems.  $C_{23}H_{40}O_6S$  Oil. **Source:** Marine-derived fungus *Zygosporium* sp. KNC52 from an unidentified hard coral (Palau, Oceania, Oceania).

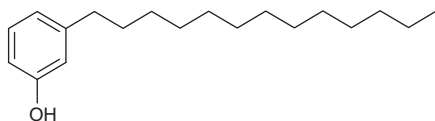


**Pharm:** FtsZ GTPase inhibitor ( $IC_{50} = 25 \mu\text{g/mL}$ , almost completely inhibited FtsZ polymerization at  $25 \mu\text{g/mL}$ , FtsZ is a structural homolog of eukaryotic tubulin and, similar to tubulin, is a GTPase that polymerizes in a GTP-regulated manner); antimycobacterial (*Mycobacterium tuberculosis* MDR-TB, *Mycobacterium bovis* BCG, *Mycobacterium avium*, all MICs =  $166 \mu\text{g/mL}$ ); antibacterial (*Pseudomonas aeruginosa* MDRP, MIC =  $50 \mu\text{g/mL}$ , MRSA, MIC =  $12.5 \mu\text{g/mL}$ ). **Ref:** K. Kanoh, et al, J. Antibiot., 2008, 61, 192



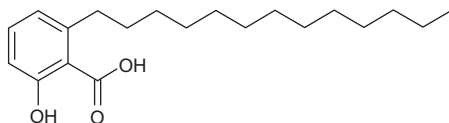
### 876 3-Tridecylphenol

**Type:** Long-chain aromatic systems.  $C_{19}H_{32}O$  mp  $44\text{--}45 \text{ }^\circ\text{C}$ . **Source:** Brown alga *Caulocystis cephalornithos*. **Pharm:** Phospholipase Cy1 inhibitor. **Ref:** R. Kazlauskas, et al, Aust. J. Chem., 1980, 33, 2097



### 877 6-Tridecylsalicylic acid

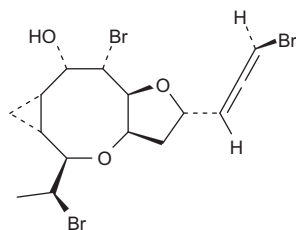
**Type:** Long-chain aromatic systems.  $C_{20}H_{32}O_3$  Plates (hexane), mp  $85\text{--}86 \text{ }^\circ\text{C}$ , mp  $73\text{--}74 \text{ }^\circ\text{C}$ , Sol. MeOH,  $C_6H_6$ ; fairly sol. hexane; poorly sol.  $H_2O$ . **Source:** Brown alga *Caulocystis cephalornithos*. **Pharm:** Anti-inflammatory. **Ref:** R. Kazlauskas, et al, Aust. J. Chem., 1980, 33, 2097



## 1.18 Marine Acetogenins

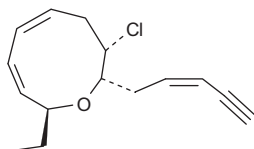
### 878 Aplyparvunin

**Type:** Marine acetogenins.  $C_{15}H_{19}Br_3O_3$  Rods ( $CHCl_3$ ), mp  $138\text{--}139 \text{ }^\circ\text{C}$ ,  $[\alpha]_D^{22} = -131.4^\circ$  ( $c = 1.5$ ,  $CHCl_3$ ). **Source:** Sea hare *Aplysia parvula*. **Pharm:** Ichthyotoxic (mosquito fish);  $LC_{100}$  (mosquito fish, 24 hr) = 3 ppm. **Ref:** T. Miyamoto, et al, Tet. Lett., 1995, 36, 6073



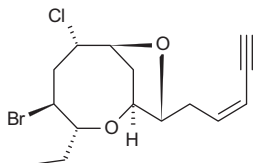
### 879 Brasilenyne

**Type:** Marine acetogenins.  $C_{15}H_{19}ClO$  Cryst. (pentane), mp 37–38 °C,  $[\alpha]_D^{21} = +216^\circ$  ( $c = 0.017$ ,  $CHCl_3$ ). **Source:** Sea hare *Aplysia brasiliiana*. **Pharm:** Antifeedant (fish). **Ref:** R. B. Kinnel, et al, Proc. Natl. Acad. Sci. USA, 1979, 76, 3576



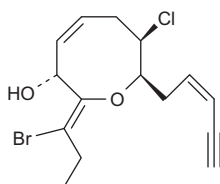
### 880 (3Z)-Chlorofucin

**Type:** Marine acetogenins.  $C_{15}H_{20}BrClO_2$  Oil,  $[\alpha]_D^{24} = -11.3^\circ$  ( $c = 0.6$ ,  $CHCl_3$ ). **Source:** Red alga *Laurencia pannosa* (Malaysia). **Pharm:** Antibacterial (*Chromobacterium violaceum*, MIC = 100  $\mu$ g/disk). **Ref:** M. Suzuki, et al, JNP, 2001, 64, 597



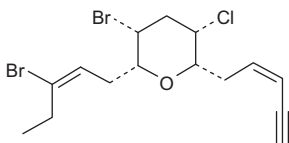
### 881 Chondriol

**Type:** Marine acetogenins.  $C_{15}H_{18}BrClO_2$  Oil. **Source:** Red alga *Laurencia yamada*. **Pharm:** Antibiotic. **Ref:** W. Fenical, et al, Tet. Lett., 1974, 1507

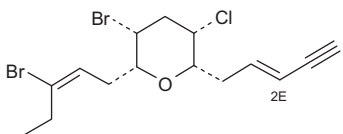


**882 *cis*-Dactylyne**

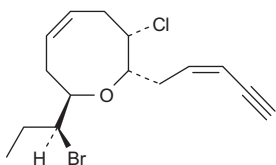
**Type:** Marine acetogenins.  $C_{15}H_{19}Br_2ClO$  Cryst., mp 62.2–63.3 °C,  $[\alpha]_D^{25} = -36^\circ$  ( $c = 15.2$ ,  $CHCl_3$ ). **Source:** Sea hare *Aplysia dactylomela*. **Pharm:** CNS depressant; cytochrome inhibitor. **Ref:** F. J. McDonard, et al, JOC, 1975, 40, 665 | D. J. Vanderah, et al, JOC, 1976, 41, 3480 | L. Gao, et al, Tet. Lett., 1992, 33, 4349

**883 *trans*-Dactylyne**

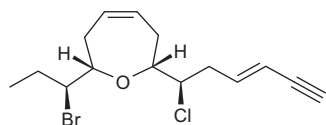
**Type:** Marine acetogenins.  $C_{15}H_{19}Br_2ClO$  Oil,  $[\alpha]_D^{24} = -8.06^\circ$  ( $c = 7.97$ ,  $CHCl_3$ ). **Source:** Sea hare *Aplysia dactylomela*. **Pharm:** Antibiotic. **Ref:** F. J. McDonald, et al, JOC, 1975, 40, 665 | D. J. Vanderah, et al, JOC, 1976, 41, 3480 | L. Gao, et al, Tet. Lett., 1992, 33, 4349

**884 *cis*-Isodihydrorhodophytin**

**Type:** Marine acetogenins.  $C_{15}H_{20}BrClO$  Oil,  $[\alpha]_D^{25} = +71.4^\circ$  ( $c = 0.0042$ ,  $CHCl_3$ ). **Source:** Red alga *Laurencia pinnatifida*, sea hare *Aplysia brasiliiana*. **Pharm:** Antifeedant (fish, potent). **Ref:** R. B. Kinnel, et al, Proc. Natl. Acad. Sci. USA, 1979, 76, 3576

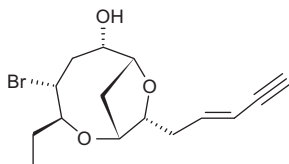
**885 Isolaurepinnacin**

**Type:** Marine acetogenins.  $C_{15}H_{20}BrClO$  Oil,  $[\alpha]_D = -6.2^\circ$  ( $CHCl_3$ ). **Source:** Red alga *Laurencia pinnata*. **Pharm:** Insecticide. **Ref:** A. Fukuzawa, et al, Tet. Lett., 1981, 22, 4081 | H. Kotsuki, et al, JOC, 1989, 54, 5153



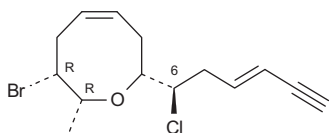
### 886 Laurefurenyne F

**Type:** Marine acetogenins.  $C_{15}H_{21}BrO_3$  Amorph. solid,  $[\alpha]_D^{25} = +17^\circ$  ( $c = 0.1$ , MeOH). **Source:** Red alga *Laurencia* sp. **Pharm:** Cytotoxic (moderate and nonselective, 60  $\mu\text{g}/\text{disk}$ , L1210, zone differential = 250; Colon38, zone differential = 450; CFU-GM, zone differential = 400; H116, zone differential = 200; H125, zone differential = 100; hmn CFU-GM, zone differential = 0). **Ref:** W. M. Abdel-Mageed, et al, Tetrahedron, 2010, 66, 2855



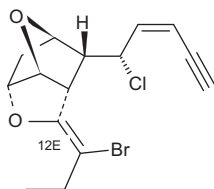
### 887 Laurepinnacin

**Type:** Marine acetogenins.  $C_{15}H_{20}BrClO$  Oil,  $[\alpha]_D = -35.3^\circ$  ( $\text{CHCl}_3$ ). **Source:** Red alga *Laurencia pinnata*. **Pharm:** Insecticide. **Ref:** A. Fukuzawa, et al, Tet. Lett., 1981,22, 4081



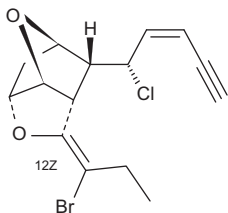
### 888 (12E)-Lembyne A

**Type:** Marine acetogenins.  $C_{15}H_{16}BrClO_2$  Oil,  $[\alpha]_D^{24} = +42^\circ$  ( $c = 0.02$ ,  $\text{CHCl}_3$ ). **Source:** Red alga *Laurencia mariannensis* (Okinawa). **Pharm:** Antibacterial (paper disc diffusion assay, *Alcaligenes aquamarinus*, *Azomonas agilis*, *Erwinia amylovora* and *Escherichia coli*, MIC = 20–30  $\mu\text{g}/\text{disc}$ ). **Ref:** C. S. Vairappan, et al, Phytochemistry, 2001, 58, 517

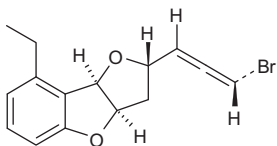


**889 (12Z)-Lembyne A**

**Type:** Marine acetogenins.  $C_{15}H_{16}BrClO_2$  mp 95–96 °C,  $[\alpha]_D^{24} = +197.6^\circ$  ( $c = 0.70$ ,  $CHCl_3$ ). **Source:** Red alga *Laurencia* sp. (Malaysia waters). **Pharm:** Antibacterial (paper disc diffusion assay, all marine bacteria collected in Malaysian waters, 90  $\mu\text{g}/\text{disc}$ : *Clostridium cellobioparum* IZD = 12–18 mm, *Chromobacterium violaceum* IZD = 7–12 mm, *Flavobacterium helmiphilum* IZD = 7–12 mm, *Proteus mirabilis* IZD = 7–12 mm, *Vibrio parahaemolyticus* IZD = 7–12 mm, MIC = 20–60  $\mu\text{g}/\text{disc}$ ; 90  $\mu\text{g}/\text{disc}$  inactive for *Clostridium fallax*, *Clostridium novyi*, *Clostridium sordellii*, *Enterobacter aerogenes*, *Shigella flexneri*, *Vibrio cholerae* and *Vibrio vulnificus*). **Ref:** C. S. Vairappan, et al, *Phytochemistry*, 2001, 58, 291

**890 Panacene**

**Type:** Marine acetogenins.  $C_{15}H_{15}BrO_2$  Oil,  $[\alpha]_D^{21} = +382^\circ$ . **Source:** Sea hare *Aplysia brasiliiana*. **Pharm:** Antifeedant (fish); analgesic; tranquilliser. **Ref:** R. Kinnel, et al, *Tet. Lett.*, 1977, 3913 | K. S. Feldman, et al, *JACS*, 1982, 104, 4011 | K. S. Feldman, *Tet. Lett.*, 1982, 23, 3031



# Index 1 Compound Name and Synonym Index

This index lists in alphabetical order all active compound's 1,064 entry names including both 890 key names and 174 synonym names contained in the bodies of compound entries. A equal sign (=) and compound code number (from 1 to 890) follow the name immediately for locating the compound in the "Handbook of Active Marine Natural Products Volume 6" book. Following symbols are ineffective in ordering: *D*-, *L*-, *dl*-, *R*-, *S*-, *E*-, *Z*-, *O*-, *N*-, *C*-, *H*-, *cis*-, *trans*-, *ent*-, *epi*-, *meso*-, *erythro*-, *threo*-, *sec*-, *seco*-<sup>§</sup>, *m*-, *o*-, *p*-, *n*-,  $\alpha$ -,  $\beta$ -,  $\gamma$ -,  $\delta$ -,  $\epsilon$ -,  $\kappa$ -,  $\xi$ -,  $\psi$ -,  $\omega$ -, (+), (-), ( $\pm$ ) etc., and: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, {}, [], (), ,, ;, \*, ', ", " ",  $\rightarrow$ , etc. (<sup>§</sup>note: In the books regular "seco-" is effective in ordering as "nor-".)

## A

A82775C enantiomer = 327.

Abyssomicin J = 549.

Acanthacerebroside A = 734.

1-Acetoxy-4-(10-acetoxy-3,5,7-decatrienyl) benzene = 861.

4-Acetoxy-2-bromo-5,6-epoxy-2-cyclohexen-1-one = 355.

4-(10-Acetoxy-3,5,7-decatrienyl)phenol. = 862.

7-Acetoxy-7,8-dihydrochlorovulone I = 630.

6-Acetoxylinoleic acid = 51.

Acremostrictin = 536.

Actisonitrile = 1.

Adociacetylene A = 236.

Adociacetylene C = 260.

Adociacetylene D = 148.

Agelagalastatin = 735.

Agelasphin 10 = 819.

Agelasphin 11 = 736.

Agelasphin 13 = 737.

Agelasphin 7A = 738.

Agelasphin 9A = 739.

Agelasphin 9B = 740.

Aikupikoxide B = 417.

Aikupikoxide C = 418.

Aikupikoxide D = 419.

Alternaroside A = 741.

Alternaroside B = 742.

Alternaroside C = 743.

1-O-(4-Amino-4-deoxy- $\alpha$ -D-mannopyranosyl) glycerol = 702.

2-Amino-9,13-dimethylheptadecanoic acid = 19.

(2*R*,3*R*)-Aminotetradeca-5,7-dien-3-ol = 744.

(2*R*,3*S*)-Aminotetradeca-5,7-dien-3-ol = 745.

2-Amino-5-tetradecen-3-ol = 29.

(2*S*)-Amino-13-tetradecen-(3*R*)-ol = 39.

1-Amino-4,12-tridecadien-2-ol = 30.

(2*S*,4*E*)-1-Amino-4-tridecen-2-ol = 746.

(2*R*,5*E*)-1-Amino-5-tridecen-2-ol = 31.

Amphidinoketide I = 96.

Amphidinoketide II = 97.

Amphidinolactone A = 632.

Amphimic acid A = 571.

Amphimic acid B = 572.

Amphimic acid C = 573.

Andavadoic acid = 420.

Antibiotic 1010-F1 = 19.

Antibiotic GERI-BP001 M = 559.

Antibiotic SMP 2 = 111.

Aplidiasphingosine = 98.

Aplydilactone = 641.

Aplyolide A = 52.

Aplyolide B = 53.

Aplyolide C = 54.

Aplyolide D = 55.

Aplyolide E = 56.

Aplyparvunin = 878.

Archidorin = 655.

Ascidiatrienolide A = 633.

Asperamide A = 747.

Aspergillide A = 57.

Aspergillide B = 58.

Aspergillide C = 59.

*epi*-Aspinonediol = 99.

Aspinonene = 100.

Aspinotriol A = 101.

Aspinotriol B = 102.

Astrocerebroside A = 748.

Attenol B = 511.

Aurantoic acid = 60.

Aureobasidin = 2.

Avuside A = 749.

Avuside B = 750.

<https://doi.org/10.1515/9783110655797-002>

Awajanomycin = 524.

4-Azoniaspiro[3.3]heptane-2,6-diol = 510.

## B

Bacillariolide I = 580.

Bacillariolide II = 581.

Bathymodiolamide A = 751.

Bathymodiolamide B = 752.

Batilol = 703.

Batyl alcohol-3-*O*- $\alpha$ -*L*-fucopyranoside = 704.

(4*R*,7*S*,*E*)-10-Benzyl-5,7-dimethylundeca-1,5,  
10-trien-4-ol = 863.

6,12-Bis(hydroxymethyl)-6,12-diundecyl-  
1,7-dioxacyclododecane-2,8-dione = 27.

Botryosphaerin F = 550.

Brasilenyne = 879.

11-Bromo-3,12-dihydroxy-2,2,4,

10-tetramethyl-4,6,8,10,14,

16-eicosahexa- en-18-ynamide = 331.

22-Bromo-17*E*,21*E*-docosadiene-9,11,19-triynoic  
acid = 261.

22-Bromo-17*E*,21*Z*-docosadiene-9,11,19-triynoic  
acid = 262.

(all-*E*)-20-Bromo-5,11,15,19-eicosatetraene-  
9,17-diynoic acid = 263.

(all-*E*)-20-Bromo-11,15,19-eicosatriene-9,17-  
diynoic acid = 264.

16-Bromo-7,15-hexadecadiene-5-ynoic acid  
= 265.

18-Bromo-9*E*,17*E*-octadecadiene-5,7-diynoic  
acid = 266.

18-Bromo-9*E*,17*E*-octadecadiene-7,15-diynoic  
acid = 267.

18-Bromo-9*Z*,17*E*-octadecadiene-7,15-diynoic  
acid = 268.

18-Bromo-9*E*,15*E*-octadecadiene-5,7,17-triynoic  
acid = 269.

18-Bromo-9*E*,17*E*-octadecadiene-5,7,15-triynoic  
acid = 270.

18-Bromo-13*E*,17*E*-octadecadiene-5,7,15-triynoic  
acid = 271.

18-Bromo-13*E*,17*Z*-octadecadiene-5,7,15-triynoic  
acid = 272.

18-Bromo-13*Z*,17*E*-octadecadiene-5,7,15-triynoic  
acid = 273.

18-Bromo-9,17*E*-octadecadiene-5,7,15-triynoic  
acid = 274.

18-Bromo-9,17*Z*-octadecadiene-5,7,15-triynoic  
acid = 275.

18-Bromo-17*Z*-octadecadiene-5,7,15-triynoic  
acid = 276.

18-Bromo-17*E*-octadecadiene-5,7,15-triynoic  
acid = 277.

18-Bromo-5*Z*,17*E*-octadecadien-7-ynoic acid  
= 278.

18-Bromo-5*Z*,17*E*-octadecadien-7-ynoic acid  
methyl ester = 279.

18-Bromo-5*Z*,9*E*,17*E*-octadecatriene-  
7,15-diynoic acid = 280.

18-Bromo-7*E*,13*E*,17*E*-octadecatriene-  
5,15-diynoic acid = 281.

18-Bromo-9*E*,13*E*,17*E*-octadecatriene-  
7,15-diynoic acid = 282.

18-Bromo-9*E*,13*Z*,17*E*-octadecatriene-  
7,15-diynoic acid = 283.

18-Bromo-9*E*,13*E*,17*E*-octadecatriene-  
5,7,15-triynoic acid = 284.

18-Bromo-9,13,17-octadecatriene-5,7,15-triynoic  
acid = 285.

Bromotheoynic acid = 286.

Bromovulone I = 582.

Bromovulone II = 583.

Bromovulone III = 584.

Bruguierol C = 537.

6-(1,3-Butadienyl)-1,4-cycloheptadiene = 343.

1-Butoxy-2-methyl-1-(2-methylpropoxy)-2-  
propanol = 20.

6-Butyl-1,4-cycloheptadiene = 345.

6-Butyl-4,6-diethyl-1,2-dioxan-3-acetic acid  
= 421.

6-Butyl-6-ethyl-4-ethylidene-1,2-dioxan-3-acetic  
acid = 422.

(+)-(3*S*,4*S*)-3-*n*-Butyl-4-vinylcyclopentene  
= 341.

## C

Calicogorgin A = 753.

Calicogorgin B = 754.

Calicogorgin C = 755.

Callyberyne A = 144.

Callyberyne B = 145.

Callypentayne = 144.

Callyspongina A = 328.

Callyspongina B = 329.

Callyspongina sulfate A = 330.

Callyspongiolide = 287.

Callysponginic acid = 288.

Callytetrayne = 146.

- Callytriol A = 149.  
Callytriol B = 150.  
Callytriol C = 151.  
Callytriol D = 152.  
Callytriol E = 153.  
Calyceramide A = 756.  
Calyceramide B = 757.  
Calyceramide C = 758.  
Calyculin A = 658.  
Calyculinamide A = 659.  
Calyculinamide B = 660.  
Calyculinamide F = 661.  
Calyculin B = 662.  
Calyculin C = 663.  
Calyculin D = 664.  
Calyculin G = 665.  
Calyculin H = 666.  
Calyculin J = 667.  
Calyxoside = 759.  
Capsofulvesin A = 61.  
Capsofulvesin B = 62.  
Capucinoic acid A = 423.  
Capucinoic acid B = 424.  
(2-Carboxyethyl)dimethylsulfonium(1+)  
= 3.  
Carteriosulfonic acid A = 63.  
Carteriosulfonic acid B = 64.  
Carteriosulfonic acid C = 65.  
Caudoxirene = 342.  
Caulerpicin A = 760.  
Caulerpicin B = 761.  
Caulerpicin C = 762.  
CEG 3 = 763.  
CEG 4 = 764.  
CEG 5 = 765.  
CEG 6 = 766.  
Ceramide 1 = 767.  
Ceratodictyol A = 705.  
Ceratodictyol B = 706.  
Ceratodictyol C = 707.  
Ceratodictyol C 6'-epimer = 708.  
Ceratodictyol D = 708.  
Ceratodictyol E = 709.  
Ceratodictyol F = 710.  
Cerebroside A = 768.  
Cerebroside B = 769.  
Cerebroside C = 770.  
Cerebroside CE-1-1 = 774.  
Cerebroside CE-1-2 = 771.  
Cerebroside CE-1-3 = 772.  
Cerebroside D = 773.  
Cerebroside PA-0-5 = 774.  
Cervicoside = 4.  
Charamin = 510.  
(*R*)-Chimyl alcohol = 711.  
(3*Z*)-Chlorofucin = 880.  
2-Chloro-4-hydroxy-4-(1-hydroxyethyl)-  
2-cyclopenten-1-one = 384.  
(-)-(*E*)-1-Chlorotridec-1-ene-6,8-diol = 32.  
Chlorovulone I = 585.  
Chlorovulone II = 586.  
Chlorovulone III = 587.  
Chondrillin = 425.  
6-*epi*-Chondrillin = 479.  
Chondriol = 881.  
Chrysogeside B = 775.  
Cladionol A = 103.  
Clathrynamide A = 331.  
Clathrynamide B = 332.  
Clathrynamide C = 333.  
Claviridenone B = 602.  
Claviridenone C = 601.  
Claviridenone D = 600.  
Claviridenone E = 588.  
Claviridenone F = 589.  
Claviridenone G = 590.  
Claviridic acid A = 591.  
Claviridic acid B = 592.  
Claviridic acid C = 593.  
Claviridic acid D = 594.  
Claviridic acid E = 595.  
Claviridin A = 596.  
Claviridin B = 597.  
Claviridin C = 598.  
Claviridin D = 599.  
Clavirin I = 356.  
Clavirin II = 357.  
Clavosine A = 668.  
Clavosine B = 669.  
Clavubicyclone = 642.  
Clavulone I = 600.  
Clavulone II = 601.  
Clavulone III = 602.  
Coixol = 525.  
Corticatic acid A = 289.  
Corticatic acid B = 290.  
10,15-Cyclo-4,7-epidioxy-1-nor-11(18)-phyten-  
2-oic acid = 426.



- (3*S*,4*S*,7*S*,10*E*)-10,15-Cyclo-4,7-epoxy-10-hydroxy-1-nor-11(18)-phyten-2-oic acid methyl ester = 417.  
Cystophorene = 33.
- D**  
*cis*-Dactylyne = 882.  
*trans*-Dactylyne = 883.  
Dalesconol A = 412.  
Dalesconol B = 413.  
Dankastatin A = 504.  
Dankastatin B = 505.  
22-Deacetoxyanuthone A = 358.  
7-Deacetoxyanuthone A = 358.  
4-Deacetoxy-12-*O*-deacetylclavulone I = 603.  
4-Deacetoxy-12-*O*-deacetylclavulone II = 604.  
4-Deacetoxy-12-*O*-deacetylclavulone III = 605.  
Debromogrenadadiene = 104.  
4*Z*,7*Z*-Decadien-1-ol-*O*-sulfate = 34.  
4,6,8,10,12,14,16,18,20,22-Decamethoxy-1-heptacosene = 35.  
3*Z*,6*Z*,9-Decatrien-1-ol-*O*-sulfate = 36.  
Dehydroeurypongine A = 538.  
Delessierine = 512.  
2-Demethyl-4-peroxyplakoenoic acid A<sub>1</sub> methyl ester = 427.  
Desmarestene = 343.  
2,29-Diamino-4,6,10,13,16,19,22,26-triacontaoctaene-3,28-diol = 776.  
(5*Z*,11*E*,15*E*,19*E*)-6,20-Dibromoeicosa-5,11,15,19-tetraen-9,17-diynoic acid = 291.  
(7*E*,15*Z*)-14,16-Dibromo-7,13,15-hexadecatrien-5-ynoic acid = 292.  
18,18-Dibromo-9*Z*,17*E*-octadecadiene-5,7-diynoic acid = 293.  
(*Z*)-18,18-Dibromo-5,17-octadecadien-7-ynoic acid = 294.  
18,18-Dibromo-5*Z*,17-octadecadien-7-ynoic acid methyl ester = 295.  
(1*E*,5*Z*)-1,6-Dichloro-2-methyl-1,5-heptadien-3-ol = 105.  
Dichloroverongiaquinol = 359.  
Dictyopterene A = 344.  
Dictyopterene B = 347.  
(*R*)-Dictyopterene C' = 345.  
Dictyotene = 345.  
Didemnenone A = 360.  
Didemnenone B = 361.  
Didemnenone C = 362.  
Didemnenone D = 363.  
Didemnilactone = 634.  
Didemnilactone A = 634.  
Didemnilactone B = 635.  
Dideoxypetrosynol A = 204.  
Dideoxypetrosynol B = 206.  
Dideoxypetrosynol C = 205.  
Dideoxypetrosynol D = 154.  
Dideoxypetrosynol F = 155.  
4,6-Diethyl-3,6-dihydro-6-(2-methylhexyl)-1,2-dioxin-3-acetic acid = 428.  
(3*S*,6*R*,8*S*)-4,6-Diethyl-3,6-dihydro-6-(2-methylhexyl)-1,2-dioxin-3-acetic acid ethyl ester = 429.  
4,6-Diethyl-6-(2-ethyl-4-methyl-4-oxo-1,2-dioxane-3-acetic acid) = 430.  
4,6-Diethyl-6-hexyl-3,6-dihydro-1,2-dioxin-3-acetic acid Me ester = 431.  
4,6-Diethyl-6-(4-methyl-1-octenyl)-1,2-dioxane-3-acetic acid = 460.  
(1'*E*,3*S*,4*R*,4'*R*,5'*E*,6*S*)-6-(2,4-Diethyl-1,5-octadienyl)-4,6-diethyl-1,2-dioxane-3-acetic acid = 432.  
6-(2,4-Diethyl-1-octenyl)-4,6-diethyl-1,2-dioxane-3-acetic acid = 433.  
Dihomopetrocortyne A = 156.  
(*E*)-7,7*a*-Dihydro-5-hydroxy-7-(2-propenylidene)cyclopenta[*c*]pyran-6(2*H*)-one = 506.  
(*Z*)-7,7*a*-Dihydro-5-hydroxy-7-(2-propenylidene)cyclopenta[*c*]pyran-6(2*H*)-one = 507.  
4,5-Dihydroisopetroformyne 3 = 157.  
23,24-Dihydropetroformyne 6 = 237.  
23,24-Dihydropetroformyne 7 = 238.  
14,15-Dihydrosiphonodiol = 158.  
Dihydrothiopyranone = 415.  
(3*R*,5*S*)-3,5-Dihydroxydecanoic acid = 5.  
(2*S*,3*R*)-1,3-Dihydroxy-2-docosanoyl-amino-4*E*-hexacoene = 777.  
(2*S*,3*R*)-1,3-Dihydroxy-2-octadecanoyl-amino-4*E*,8*E*-hexadecadiene = 778.  
10-(3,4-Dihydroxyphenyl)-3,5,7-decatrien-1-ol 1,3'-diacetate = 864.  
10-(3,4-Dihydroxyphenyl)-3,5,7-decatrien-1-ol 1,4'-diacetate = 865.  
10-(3,4-Dihydroxyphenyl)-3,5,7-decatrien-1-ol triacetate = 866.  
4,5-Dihydroxy-3-(1-propenyl)-2-cyclopenten-1-one = 381.

- 6-(1,2-Dihydroxypropyl)-5-(7-methyl-1,3,5-nonatrienyl)-3-cyclohexene-1,2-diol = 354.
- 3,28-Dihydroxy-4,26-triacontadiene-1,12,18,29-tetraene-14,17-dione = 148.
- 3 $\alpha$ ,28 $\alpha$ -Dihydroxy-1,12,18,29-Triacontatetraene-14,17-dione = 239.
- 3 $\beta$ ,28 $\beta$ -Dihydroxy-1,12,18,29-Triacontatetraene-14,17-dione = 240.
- 2,5-Dimethyldodecanoic acid = 21.
- 2,6-Dimethyl-5-heptenal = 106.
- 2,6-Dimethylheptyl sulfate = 22.
- (2*R*\*,4*R*\*)-2,4-Dimethyl-4-hydroxy-16-phenylhexadecanoic acid 1,4-lactone = 867.
- (2*R*\*,4*R*\*)-2,4-Dimethyl-4-hydroxy-16-phenylhexadecanoic acid 1,4-lactone = 868.
- 2,5-Dimethylauric acid = 21.
- (3*Z*)-4,8-Dimethylnon-3-en-1-yl sulfate = 107.
- 3,5-Dimethyl-5-(10-phenyldecyl)-1,2-dioxolane-3-acetic acid = 420.
- Dimethyl- $\beta$ -propiothetin = 3.
- 2-(Dimethylsulfonio)cyclopropane carboxylate = 389.
- 3,4,4-Dioxopetroformyne 1 = 241.
- 3,4,4-Dioxopetroformyne 2 = 242.
- Diphenyl-cyclooctylphosphoramidate = 670.
- (3*E*,15*Z*)-3,15-Docosadien-1-yne = 147.
- 4,15-Docosadien-1-yn-3-ol = 159.
- N*-Docosanoyl-(2*S*,3*S*,4*R*)-2-amino-16-methyl-1,3,4-heptadecanetriol 1-*O*-(2-acetamido-2-deoxy- $\beta$ -*D*-glucopyranoside) = 787.
- (2*S*,3*R*,4*E*,14*E*)-*N*<sup>2</sup>-Docosanoyl-2-imino-14-methyl-4-hexadecene-1,3-diol 1-*O*-[ $\alpha$ -*L*-fucopyranosyl-(1 $\rightarrow$ 2')-*N*-glycolyl- $\alpha$ -*D*-neuramino-pyranosyl-(2 $\rightarrow$ 4)-*N*-acetyl- $\alpha$ -*D*-neuraminopyranosyl-(2 $\rightarrow$ 6)- $\beta$ -*D*-glucopyranoside] = 766.
- N*-Docosanoyl-*D*-erythro-(2*S*,3*R*)-16-methyl-heptadecasping-4(*E*)-enine = 779.
- 2,4-Dodecadiyn-1-ol = 160.
- Dodecane-2,4-diyn-1-ol = 160.
- 2-(11-Dodecene-2,4-diynloxy)ethanol = 182.
- Dysiherbaine = 513.
- E**
- Ecklonialactone A = 606.
- Ecklonialactone B = 607.
- Ectocarpene = 346.
- 1-*O*-(13'*Z*-Eicosaeenyl)-sn-glycero-3-phosphocholine = 671.
- (5,8,11,14,17)-Eicosapentaenoic acid = 66.
- (3*S*,4*E*)-Eicos-4-en-1-yn-3 $\beta$ -ol = 161.
- 3-Eicosyloxy-1,2-propanediol = 712.
- Elenic acid = 869.
- Enol dibromoacetate = 47.
- Enol tribromoacetate = 48.
- EPA = 66.
- 3-Epideoxyenterocin = 539.
- 3,6-Epidioxy-7,10-epoxy-17,19,23-tetracosatrienoic acid = 495.
- 3,6-Epidioxy-4,6,8,10-tetraethyltetradeca-7,11-dienoic acid = 434.
- 3,6-Epidioxy-4,6,8-triethyl-10-methyltetradecanoic acid = 430.
- (+)-Epoxydon = 364.
- (+)-*epi*-Epoxydon = 365.
- 6,7-Epoxy-5-(hydroxymethyl)-3-octene-2,5-diol = 100.
- (9*Z*,11*R*,12*S*,13*S*,15*Z*)-12,13-Epoxy-11-hydroxyoctadeca-9,15-dienoic acid = 67.
- (-)-9,10-Epoxy muqublin A isomer = 435.
- (-)-13,14-Epoxy muqublin A = 436.
- Erylusamine B = 713.
- Erylusamine C = 714.
- Erylusamine D = 715.
- Erylusamine E = 716.
- Erylusamine TA = 717.
- Erylusidine = 718.
- Erylusine = 719.
- Ethyl didehydroplakortide Z = 437.
- (-)-(4*R*\*,5*S*\*)-3-Ethyl-4,5-dihydroxycyclopent-2-enone = 386.
- (12*Z*,15*Z*)-19-Ethyl-2,6-epoxy-1-oxacyclononadeca-2,5,12,15,18-pentaen-9-yn-4-one = 334.
- Ethyl plakortide Z = 438.
- Exophilin A = 23.
- F**
- Ficulinic acid A = 108.
- Ficulinic acid B = 109.
- Finavarrene = 37.
- Flavicerebroside A = 780.
- Flavicerebroside B = 781.
- Flavuside A = 749.
- Flavuside A = 782.

Flavuside B = 750.

Flavuside B = 783.

Franklinolide A = 672.

Franklinolide B = 673.

Franklinolide C = 674.

Fucoserratene = 38.

Fulvinol = 162.

## G

Galbanolene = 33.

Ganglioside CG-1 = 784.

Ganglioside HPG-1 = 785.

Ganglioside SJG-1 = 786.

Geometricin A = 675.

Gloeolactone = 638.

Glycerol-1-(7Z,10Z,13Z-hexadecatrienoate),  
2-(9Z,12Z,15Z-octadecatrienoate)-(2R)-  
3-O-β-D-Galactopyranoside = 720.

Glycerol 1-hexadecyl ether diacetate = 721.

Glycerol 1-(2R-methoxyhexadecyl) ether = 722.

Glycerol 2-(3-methyl-2-butenolate) 1-(2,4,11-  
tridecatrienoate) = 656.

Glycerol 2-(3-methylthio-2-propenoate)  
1-(2,4,11-tridecatrienoate) = 657.

Gonyauline = 389.

Gracilioether H = 546.

Gracilioether K = 551.

Grenadadiene = 110.

Grenadamide = 574.

Grenadamide A = 574.

Gymnastatin F = 399.

Gymnastatin G = 400.

Gymnastatin R = 401.

## H

Halaminol A = 39.

Halaminol B 2-Amino-11-dodecen-3-ol = 40.

Haliangicin A = 111.

*cis*-Haliangicin A = 112.

Haliangicin B = 113.

Haliangicin C = 114.

Haliangicin D = 115.

(-)-Halicholactone = 575.

Halicylindroside A<sub>1</sub> = 787.

Halicylindroside A<sub>2</sub> = 788.

Halicylindroside A<sub>3</sub> = 789.

Halicylindroside A<sub>4</sub> = 790.

Halicylindroside B<sub>1</sub> = 791.

Halicylindroside B<sub>2</sub> = 792.

Halicylindroside B<sub>3</sub> = 793.

Halicylindroside B<sub>4</sub> = 794.

Halicylindroside B<sub>5</sub> = 795.

Halicylindroside B<sub>6</sub> = 796.

Halymecin A = 24.

Halymecin B = 25.

Haterumadioxin A = 439.

Haterumadioxin B = 440.

Hedathiosulfonic acid A = 116.

Hedathiosulfonic acid B = 117.

Hemicalyculin = 676.

(Z,Z)-12,18-Heneicosadiene-  
1,3,8,10,20-pentayne = 144.

Heneicosane-1,21-diyl disulfate = 6.

3,12,18-Heneicosatriene-1,8,10,20-  
tetrayne = 145.

8-HEPE = 73.

*N*-Heptadecanoyl-(2S,3R,4E)-2-amino-4-  
octadecene-1,3-diol = 761.

1-Heptadecanyl-*O*-sulfate = 7.

(3Z,5E)-3-Heptatriaconten-1-yn-5-ol = 163.

2-Heptyl-1-cyclopropanepropanoic acid = 390.

8-HETE = 75.

Heterofibrin A<sub>1</sub> = 296.

Heterofibrin A<sub>2</sub> = 297.

Heterofibrin A<sub>3</sub> = 298.

Heterofibrin B<sub>1</sub> = 299.

Heterofibrin B<sub>2</sub> = 300.

Heterofibrin B<sub>3</sub> = 301.

2,3,5,6,7,15-Hexachloro-14-pentadecen-  
4-ol = 41.

Hexachlorosulfolipid = 41.

13,15-Hexadecadiene-2,4-diyn-1-ol = 164.

6-(6,15-Hexadecadien-4-ynyl)-6-methoxy-  
1,2-dioxane-3-acetic acid = 336.

1-Hexadecanol *O*-[β-*D*-Arabinopyranosyl-(1→4)-  
β-*D*-arabinopyranosyl- (1→4)-β-*D*-  
arabinopyranoside] = 4.

*N*-Hexadecanoyl-(2S,3R,4E)-2-amino-4-  
nonadecene-1,3-diol = 797.

*N*-Hexadecanoyl-2-amino-4,8-octadecadiene-  
1,3-diol = 767.

(*all*-ξ)-*N*-Hexadecanoyl-2-imino-  
1,3,4,5-octadecanetetrol = 798.

4,7,10,13-Hexadecatetraen-15-olide = 52.

6-(6-Hexadecene-4,15-diynyl)-6-methoxy-  
1,2-dioxane-3-acetic acid = 337.

1-(3Z-Hexadecenyl)glycero-3-phosphocholine  
= 677.

- 1-(4Z-Hexadecenyl)glycero-3-phosphocholine = 678.
- 2-Hexadecyl-2,3-dihydro-4*H*-thiopyran-4-one = 415.
- 1-Hexadecylglycero-3-phosphocholine = 679.
- 4,11,23,35,42-Hexatetracontapentaene-1,45-diyne-3,44-diol = 162.
- 4,17,21,27,42-Hexatetracontapentaene-1,12,15,45-tetrayne-3,14,44-triol = 183.
- (3S,4E,14R,15Z,21Z,27Z,43Z)-4,15,21,27,43-Hexatetracontapentaene-1,12,45-triye-3,14-diol = 221.
- (3S,4E,14S,17E,21Z,27Z)-4,17,21,27-Hexatetracontatetraene-1,12,15,45-tetrayne-3,14-diol = 218.
- (3S,4E,14R,21E,22E,27Z,43Z)-4,22,27,43-Hexatetracontatetraene-1,12,15,45-tetrayne-3,14,21-triol = 197.
- (3S,4E,14E,17E,21Z,27Z,43Z)-4,21,27,43-Hexatetracontatetraene-1,12,15,45-tetrayne-3,14,17-triol = 220.
- 12,23,27-Hexatetracontatriene-1,18,21,45-tetrayne-3,20-diol = 157.
- 2-Hexylidene-3-methylsuccinic acid = 118.
- (S)-Hexylitaconic acid = 119.
- 1-[7-(2-Hexyl-3-methylcyclopropyl)heptyl]lysoplasmamanylinositol = 680.
- Hierridin A = 870.
- Hierridin B = 871.
- Hippolachnin A = 540.
- Homo-(3S,14S)-petrocortyne A = 165.
- Homothallin = 391.
- Honaucin B = 68.
- Honaucin C = 69.
- Hormosirene = 347.
- 15-HPETE = 71.
- 15-HTPE = 70.
- Hurghaperoxide = 441.
- 2,3-Hydro-7-deacetoxyanuthone A = 366.
- (5Z,8Z,11Z,13E,15S)-15-Hydroperoxy-5,8,11,13-eicosatetraenoic acid = 71.
- (5Z,8Z,11Z,13E,15S)-15-Hydroperoxy-5,8,11,13-eicosatetraenoic acid methyl ester = 72.
- (5Z,8R,9E,11Z,14Z,17Z)-8-Hydroxycicosa-5,9,11,14,17-pentaenoic acid = 73.
- (3Z,5R)-5-Hydroxy-3-decenoic acid = 74.
- 5β-Hydroxy-3,4-dimethyl-5-pentyl-2(5*H*)-furanon = 367.
- N*-(2*R*-Hydroxydocosanoyl)-(2*S*,3*S*,4*R*)-2-amino-16-methyl-1,3,4-heptadecanetriol 1-*O*-(2-acetamido-2-deoxy-β-*D*-glucopyranoside) = 794.
- N*-(2*R*-Hydroxydocosanoyl)-(2*S*,3*S*,4*R*)-2-amino-15-methyl-1,3,4-hexadecanetriol 1-*O*-(2-acetamido-2-deoxy-β-*D*-glucopyranoside) = 793.
- N*-(2*R*-Hydroxydocosanoyl)-(2*S*,3*R*,4*E*,8*E*,10*E*)-2-amino-9-methyl-4,8,10-octadecatriene-1,3-diol 1-*O*-β-*D*-glucopyranoside = 817.
- N*-(2-Hydroxydocosanoyl)-2-amino-9-methyl-4-octadecene-1,3-diol = 799.
- N*-(2*R*-Hydroxydocosanoyl)-2-amino-14-methyl-1,3,4-pentadecanetriol = 800.
- (2*S*,3*S*,4*R*,14E)-*N*<sup>2</sup>-(2'*R*-Hydroxydocosanoyl)-2-imino-14-methyl-1,3,4-hexadecanetriol 1-*O*-[*N*-(α-*L*-fucopyranosyloxy)acetyl-α-*D*-neura-minopyranosyl-(2→6)-β-*D*-glucopyranoside] = 765.
- (2*S*,3*R*,4*E*,14E)-*N*<sup>2</sup>-(2'*R*-Hydroxydocosanoyl)-2-imino-14-methyl-4-hexadecene-1,3-diol 1-*O*-[*N*-(4-*O*-acetyl-α-*L*-fucopyranosyloxy)acetyl-α-*D*-neuraminopyranosyl-(2→6)-β-*D*-glucopyranoside] = 763.
- (*S*,*E*)-30-Hydroxy-28-dotriacontene-2,9,14,19,21,31-hexaynoic acid = 288.
- N*-(2*R*-Hydroxyeicosanoyl)-(2*S*,3*R*,4*E*,8*E*,10*E*)-2-amino-9-methyl-4,8,10-octadecatriene-1,3-diol 1-*O*-β-*D*-glucopyranoside = 815.
- (5*Z*,8*R*,9*E*,11*Z*,14*Z*)-8-Hydroxy-5,9,11,14-eicosatetraenoic acid = 75.
- (12*S*)-12-Hydroxyeicosatetraenoic acid = 76.
- (3*S*,4*E*)-3-Hydroxyheneicos-4-en-1-yne = 166.
- N*-(2*R*-Hydroxyhenicosanoyl)-(2*S*,3*R*,4*E*,8*E*,10*E*)-2-amino-9-methyl-4,8,10-octadecatriene-1,3-diol 1-*O*-β-*D*-glucopyranoside = 816.
- (4*Z*,17*Z*,27*E*,29*R*)-29-Hydroxy-4,17,27-hentriacontatriene-2,20,30-triynoic acid = 289.
- 4-Hydroxy-16-heptadecene-5,7-diyn-2-one = 251.
- N*-(2*R*-Hydroxyhexadecanoyl)-2-amino-4,8-octadecadiene-1,3-diol 1-*O*-sulfate = 801.
- 5-Hydroxy-5-(hydroxymethyl)hexadecanoic acid (Secotanikolide) = 28.
- 4-Hydroxy-4-(hydroxymethyl)-5-[1-(hydroxymethyl)-1,3-butadienyl]-2-cyclopenten-1-one = 362.

- 5-Hydroxy-3-(hydroxymethyl)-7-oxabicyclo [4.1.0]hept-3-en-2-one = 364.
- N*-(2*R*-Hydroxy-21-methyldocosanoyl)-2-amino-1,3,4-pentadecanetriol = 802.
- (5*S*,3*Z*)-5-Hydroxy-16-methyleicos-3-en-1-yne = 167.
- 3-Hydroxy-4-(12-methyloctadecyl)-2-azetidinmethanol = 822.
- (2*S*,3*Z*,5*E*,7*R*)-4-(Hydroxymethyl)-3,5-octadiene-2,7-diol = 101.
- N*-(2*R*-Hydroxy-23-methyltetracosanoyl)-(2*S*,3*S*,4*R*)-2-amino-1,3,4-heptadecanetriol = 803.
- 4-Hydroxynon-2-enal = 42.
- 15-Hydroxy-9,12-octadecadien-16-olide = 53.
- 16-Hydroxy-9,12-octadecadien-15-olide = 55.
- (9*Z*,12*Z*)-7-Hydroxyoctadeca-9,12-dien-5-ynoic acid = 302.
- 3-(18-Hydroxy-1,5-octadecadien-3-ynyl)oxy-1,2-propanediol = 222.
- N*-(2*R*-Hydroxyoctadecanoyl)-2-amino-9-methyl-4,8,10-octadecatriene-1,3-diol-1-*O*-sulfate = 804.
- (9*R*,10*E*,12*Z*,15*Z*)-9-Hydroxy-10,12,15-octadecatrienoic acid = 77.
- 15-Hydroxy-6,9,12-octadecatrien-16-olide = 54.
- 16-Hydroxy-6,9,12-octadecatrien-15-olide = 56.
- N*-(2*R*-Hydroxy-3*E*-octadecenoyl)-(2*S*,3*R*,4*E*,8*E*,10*E*)-2-amino-9-methyl-4,8,10-octadecatriene-1,3-diol 1-*O*- $\alpha$ -*D*-glucopyranoside = 827.
- 1-Hydroxy-4-oxo-2,5-cyclohexadiene-1-acetic acid = 368.
- (5*Z*,8*R*,12*S*,13*E*,15*R*)-15-Hydroxy-9-oxo-5,10,13-prostatrien-1-oic acid = 570.
- N*-(2*R*-Hydroxypentacosanoyl)-(2*S*,3*S*,4*R*,16*\xi*)-2-amino-16-methyl-1,3,4-octadecanetriol 1-*O*- $\alpha$ -*D*-galactopyranoside = 737.
- 4-Hydroxy-5,7-pentadecadiyn-2-one = 249.
- 4-Hydroxy-14-pentadecene-5,7-diyn-2-one = 250.
- 3-Hydroxy-4,6,8,10,12-pentamethyl-6-pentadecen-5-one = 122.
- 5-Hydroxy-pentane-2,3-dione = 10.
- N*-(2*R*-Hydroxytetracosanoyl)-(2*S*,3*S*,4*R*)-2-amino-1,3,4-heptadecanetriol 1-*O*- $\alpha$ -*D*-galactopyranoside = 739.
- N*-(2*R*-Hydroxytetracosanoyl)-(2*S*,3*S*,4*R*)-2-amino-1,3,4-hexadecanetriol 1-*O*- $\alpha$ -*D*-galactopyranoside = 738.
- N*-(2*R*-Hydroxytetracosanoyl)-(2*S*,3*S*,4*R*)-2-amino-16-methyl-1,3,4-heptadecanetriol 1-*O*- $\alpha$ -*D*-galactopyranoside = 740.
- N*-(2*R*-Hydroxytetracosanoyl)-(2*S*,3*S*,4*R*,16*\xi*)-2-amino-16-methyl-1,3,4-octadecanetriol 1-*O*- $\alpha$ -*D*-galactopyranoside = 736.
- N*-(2*R*-Hydroxytetracosanoyl)-(2*S*,3*R*,4*E*,8*E*,10*E*)-2-amino-9-methyl-4,8,10-octadecatriene-1,3-diol 1-*O*- $\beta$ -*D*-glucopyranoside = 819.
- (6*Z*,9*Z*,12*Z*,15*\xi*,16*E*,18*Z*)-15-Hydroxy-6,9,12,16,18-tetracosapentaenoic acid = 70.
- N*-(2*R*-Hydroxy-4*Z*-tetracosenoyl)-(2*S*,3*S*,4*R*)-2-amino-1,3,4-octadecanetriol 1-*O*- $\beta$ -*D*-glucopyranoside = 807.
- 2-(4-Hydroxy-3-tetraprenyl)-acetic acid = 872.
- N*-(2*R*-Hydroxytricosanoyl)-(2*S*,3*S*,4*R*)-2-amino-15-methyl-1,3,4-hexadecanetriol 1-*O*-(2-acetamido-2-deoxy- $\beta$ -*D*-glucopyranoside) = 795.
- N*-(2*\xi*-Hydroxytricosanoyl)-2-amino-9-methyl-4,8,10-octadecatriene-1,3-diol = 805.
- N*-(2*R*-Hydroxytricosanoyl)-(2*S*,3*R*,4*E*,8*E*,10*E*)-2-amino-9-methyl-4,8,10-octadecatriene-1,3-diol 1-*O*- $\beta$ -*D*-glucopyranoside = 818.
- N*-(2-Hydroxytricosanoyl)-2-amino-9-methyl-4-octadecene-1,3-diol = 806.
- R*-3-Hydroxyundecanoic acid methylester-3-*O*- $\alpha$ -*L*-rhamnopyranoside = 8.
- 4-Hydroxy-4-vinyl-2-cyclopenten-1-one = 383.
- (-)-(3*R*,4*E*,16*E*,18*R*)-icosa-4,16-diene-1,19-diyne-3,18-diol = 168.
- (+)-(3*S*,4*E*,16*E*,18*S*)-Icosa-4,16-diene-1,19-diyne-3,18-diol = 169.

## I

- Icosapent = 66.
- leodomycin A = 120.
- leodomycin B = 121.
- leodomycin C = 78.
- leodomycin D = 79.
- 7*H*-Indolo[3,2-*j*]phenanthridine-7,13(12*H*)-dione = 871.
- Insuetolide A = 552.
- (5*Z*)-Iodopunaglandin 8 = 608.
- Iodovulone I = 609.

Iodovulone II = 610.  
 Iodovulone III = 611.  
 Iotroridoside A = 807.  
 Iriomoteolide 3a = 392.  
 Isethionic acid = 9.  
 Ishigoside = 723.  
 12-Isomanadoperoxide B = 442.  
 3-(3-Isocyanocyclopenten-1-ylidene)propanoic acid = 391.  
 Isodactylone = 883.  
*cis*-Isodihydrorhodophytin = 884.  
 Isolaurepinnacin = 885.  
 Isopetroformyne 3 = 170.  
 Isopetroformyne 4 = 171.  
 Isopetroformyne 6 = 243.  
 Isopetroformyne 7 = 244.  
 Isosiphonarienolone = 122.

## J

Jacaranone = 369.  
 Jaspine A = 808.  
 Jaspine B = 809.  
 JBIR 58 = 541.

## K

(*R*)-Kjellmanianone = 393.  
 (+)-Kjellmanianone = 394.

## L

(5*Z*)-Latrunculin A 8-*O*-[2,6-dideoxy- $\beta$ -*D*-lyxo-hexopyranosyl-(1 $\rightarrow$ 3)-2,6-dideoxy- $\beta$ -*D*-lyxo-hexopyranoside] = 637.  
 Latrunculin A 8-*O*-[2,3,6-trideoxy- $\alpha$ -*L*-erythro-hexopyranosyl-(1 $\rightarrow$ 4)-2,6-dideoxy- $\beta$ -*D*-arabino-hexopyranosyl-(1 $\rightarrow$ 4)-2,6-dideoxy- $\beta$ -*L*-ribo-hexopyranoside] = 636.  
 Latrunculinoside A = 636.  
 Latrunculinoside B = 637.  
 Laurefurenyne F = 886.  
 Laurencione (open-chain form) = 10.  
 Laurepinnacin = 887.  
 (12*E*)-Lembyne A = 888.  
 (12*Z*)-Lembyne A = 889.  
 Leptosphaerone C = 352.  
 Leucettamol A = 810.  
 Leucettamol B = 811.  
 Liagoric acid = 303.  
 Linoleate = 80.  
 Lissoclibadin 3 = 501.

Lissoclibadin 11 = 502.  
 Lissoclibadin 12 = 503.  
 LMG 1 = 812.  
 Lobophytone A = 402.  
 Lobophytone O = 403.  
 Lobophytone P = 404.  
 Lobophytone Q = 405.  
 Lobophytone R = 406.  
 Lobophytone S = 407.  
 Lobophytone T = 353.  
*Luidia maculata* Ganglioside 1 = 812.  
 Lyngbic acid = 81.  
 Lyngbyoic acid = 390.  
 Lysophosphatidyl inositol JMB99-709A = 681.  
 Lysophosphatidyl inositol JMB99-709B = 682.  
 Lysoplasmanylinositol 1 = 680.  
 Lysoplasmanylinositol 2 = 684.

## M

Macrolactin A = 848.  
 Macrolactin F = 849.  
 Macrolactin G = 850.  
 Macrolactin H = 851.  
 Macrolactin I = 852.  
 Macrolactin J = 853.  
 Macrolactin K = 854.  
 Macrolactin L = 855.  
 Macrolactin M = 856.  
 Macrolactin V = 857.  
 Macrolactin W = 858.  
 Macrospheptide A = 841.  
 Macrospheptide E = 842.  
 Macrospheptide F = 843.  
 Macrospheptide G = 844.  
 Macrospheptide H = 845.  
 Macrospheptide L = 846.  
 Macrospheptide M = 847.  
 Manadic acid A = 443.  
 (-)-Manadic acid B = 444.  
 (+)-Manadic acid B = 445.  
 Manadoperoxide B = 446.  
 Manadoperoxide C = 447.  
 Manadoperoxide E = 448.  
 Manadoperoxide F = 449.  
 Manadoperoxide G = 450.  
 Manadoperoxide H = 451.  
 Manadoperoxide I = 452.  
 Manadoperoxide J = 453.  
 Manadoperoxide K = 454.

- Manadoperoxidic acid B = 444.  
 Manzamenone A = 643.  
 Manzamenone M = 644.  
 Manzamenone N = 645.  
 Manzamenone O = 646.  
 6-Methoxy-2(3*H*)-benzoxazolinone = 525.  
 (4-Methoxycarbonylbutyl)-trimethylammonium chloride = 11.  
 (-)-7-Methoxydodec-4(*E*)-enoic acid = 82.  
 (*Z*)-2-Methoxyhexadec-5-enoic acid = 83.  
 (*Z*)-2-Methoxyhexadec-6-enoic acid = 84.  
 1-*O*-(2-Methoxyhexadecyl)glycerol = 724.  
 2-Methoxytetradecanoic acid = 12.  
 (4*E*)-7-Methoxytetradec-4-enoic acid = 81.  
 Methyl 5,6-bis(acetyloxy)-10-chloro-12-hydroxy-9-oxoprostano-7,10,14,17-tetraen-1-oate = 617.  
 Methyl-18-Bromo-9*E*,17*E*-octadecadiene-5,7-diynoate = 304.  
 2-(3-Methyl-3-buten-1-ynyl)-1,4-benzenediol = 340.  
 Methyl Capucinoate A = 455.  
 Methyl 9,15-dioxo-5,8(12)-prostadienoate = 563.  
 (3*R*,4*E*,14*ξ*)-14-Methyl-4-docosen-1-yn-3-ol = 172.  
 (2*E*,6*Z*,9*Z*)-2-Methyl-2,6,9-eicosatrienal = 43.  
 (*R*)-19-Methyl-1-eicosyn-3-ol = 173.  
 (3*R*,16*ξ*)-16-Methyl-1-eicosyn-3-ol = 174.  
 1-*O*-(*cis*-11',12'-Methylene)-octadecanoylglycerol-3-phosphocholine = 683.  
 Methyl 3,6-epidioxy-6-methoxy-4,16,18-eicosatrienoate = 456.  
 Methyl 3,6-epidioxy-6-methoxy-4,14,16-octadecatrienoate = 457.  
 6-Methylheptyl sulfate = 26.  
 (3*R*,6*S*)-Methyl 6-hexadecyl-3,6-dihydro-6-methoxy-1,2-dioxin-3-acetate = 425.  
 1-(9-Methylhexadecyl)lysoplasmalinositol = 684.  
*N*-(34*S*-Methyl-5*Z*,9*Z*,12*Z*,15*Z*,18*Z*,21*Z*-hexatriacontahexaenoyl)-(2*S*,3*S*,4*E*,16*R*)-2-amino-16-methyl-4-octadecene-1,3-diol 1-*O*-β-*D*-fucopyranosyloxysulfonide = 830.  
 Methyl (5*Z*,7*E*,12*S*,14*Z*)-12-Hydroxy-9-oxo-5,7,10,14-prostatetraenoate = 603.  
 Methyl (5*E*,7*E*,12*S*,14*Z*)-12-Hydroxy-9-oxo-5,7,10,14-prostatetraenoate = 604.  
 Methyl (5*E*,7*Z*,12*S*,14*Z*)-12-Hydroxy-9-oxo-5,7,10,14-prostatetraenoate = 605.  
 Methyl linoleate = 85.  
 Methyl-6-methoxy-3,6:10,13-diperoxy-4,11-hexadecadienoate = 458.  
*N*-[15-Methyl-3-(13-methyl-4-tetradecenoyloxy)hexadecanoyl]glycine = 123.  
 Methyl montiporate A = 305.  
 Methyl myristate = 13.  
 Methyl-nuapapuanate = 459.  
 7-Methyloct-4-en-3-one = 124.  
 3-Methyl-1-(3-pentenyl)-5-hexenesulfonothioic acid = 117.  
 Methyl 5,6,7-tris(acetyloxy)-10-chloro-12-hydroxy-9-oxoprostano-10,14,17-trien-1-oate = 613.  
 8-Methyl-2-undecene-6-sulfonothioic acid = 116.  
 Miyakosyne A = 175.  
 Miyakosyne B = 176.  
 Miyakosyne C = 177.  
 Miyakosyne D = 178.  
 Miyakosyne E = 179.  
 Miyakosyne F = 180.  
 Monoethyl sulfate = 14.  
 Monotriajaponide A = 125.  
 Monotriajaponide B = 460.  
 Monotriajaponide C = 461.  
 Monotriajaponide D = 462.  
 Montiporic acid A = 306.  
 Montiporic acid B = 307.  
 Montiporyne A = 245.  
 Montiporyne B = 246.  
 Montiporyne C = 247.  
 Montiporyne D = 248.  
 Montiporyne E = 335.  
 Montiporyne F = 370.  
 Montiporyne G = 181.  
 Montiporyne H = 182.  
 Montiporyne I = 249.  
 Montiporyne J = 250.  
 Montiporyne K = 251.  
 Montiporyne L = 252.  
 Montiporyne M = 253.  
 Mooreamide A = 647.  
 Motualevic acid F = 414.  
 Mueggelone = 638.  
 (+)-(*E*)-(3*S*,4*S*)-Multifidene = 348.  
 (+)-(*Z*)-(3*S*,4*S*)-Multifidene = 349.

(-)-Muqublin A = 463.  
 Mycalamide A = 526.  
 Mycalamide B = 527.  
 Mycalamide D = 528.  
 Mycalamide E = 529.  
 Mycalol = 15.  
 Myrmekioside A = 725.  
 Myrmekioside B = 726.  
 Myrmekioside E = 727.  
 Myrothenone A = 371.

## N

Nafuredin = 514.  
 Nakienone A = 372.  
 Nakienone B = 373.  
 Navenone B = 873.  
 Navenone C = 874.  
 Neodidemnilactone = 639.  
 Neodysiherbaine A = 515.  
 Neohalicholactone = 576.  
 Neopetroformyne A = 183.  
 Neopetroformyne B = 184.  
 Neopetroformyne C = 185.  
 Neopetroformyne D = 186.  
 Nigrosporanene A = 350.  
 Nigrosporanene B = 351.  
 Nigrospoxydon A = 374.  
 4,6,8,10,12,14,16,18,20-Nonamethoxy-  
 1-pentacosene = 44.  
 Nor-(3*S*,14*S*)-petrocortyne A = 187.  
 Nuapapuin A methyl ester = 459.  
 Nuapapuin A = 464.  
 Nuapapuin B = 465.  
*epi*-Nuapapuin B = 466.

## O

Oceanalin A = 813.  
 Oceanapiside = 814.  
 (2*S*,3*R*,4*E*,14*E*)-*N*<sup>2</sup>-Octadecanoyl-2-imino-  
 14-methyl-4-hexadecene-1,3-diol 1-*O*-  
 [*N*-( $\alpha$ -*L*-fucopyranosyloxy)acetyl- $\alpha$ -*D*-  
 neuraminopyra-nosyl-(2 $\rightarrow$ 6)- $\beta$ -*D*-  
 glucopyranoside] = 764.  
 1-*O*-(3'*Z*-Octadecenyl)glycero-3-phosphocholine  
 = 685.  
 1-*O*-(4'*Z*-Octadecenyl)glycero-3-phosphocholine  
 = 686.  
 Octadecyl hydrogen sulfate = 16.  
 3-(Octadecyloxy)-1,2-propanediol = 703.

4,6,8,10,12,14,16,18-Octamethoxy-1-tricosene  
 = 45.  
 (3*R*,4*E*)-4-Octatriaconten-1-yn-3-ol = 188.  
 (3*E*,5*Z*)-Octa-1,3,5-triene = 38.  
 (*E*)-5-Octenyl sulfate = 46.  
 6-[5-(5-Octen-7-ynyl)-2-thienyl]-5-hexynoic acid  
 = 308.  
 Oleinic acid = 86.  
 Ophidiacerebroside A = 815.  
 Ophidiacerebroside B = 816.  
 Ophidiacerebroside C = 817.  
 Ophidiacerebroside D = 818.  
 Ophidiacerebroside E = 819.  
 Ophiodilactone A = 516.  
 Ophiodilactone B = 553.  
 Osirisyne A = 309.  
 Osirisyne B = 310.  
 Osirisyne C = 311.  
 Osirisyne D = 312.  
 Osirisyne E = 313.  
 Osirisyne F = 314.  
 9-Oxo-10-octadecenoic acid = 87.  
 10-Oxo-8-octadecenoic acid = 88.  
 20-Oxopetroformyne 3 = 254.

## P

Pachastrissamine = 809.  
 Paeciloxocin A = 542.  
 Panacene = 890.  
 Patulin = 517.  
 PB-1 = 670.  
 Pellynic acid = 315.  
 Pellynol A = 189.  
 Pellynol B = 190.  
 Pellynol C = 191.  
 Pellynol D = 192.  
 Pellynol F = 193.  
 Penaresidin A = 820.  
 Penaresidin B = 821.  
 Penazetidine A = 822.  
 Penicillone = 375.  
 Penicillone A = 408.  
 Penicimonoterpene = 126.  
 Penicitrinol E = 543.  
 Penicitrinol J = 554.  
 Penicitrinol K = 544.  
 Penicitrinone A = 555.  
 Penostatin F = 409.  
 Penostatin G = 556.



- Penostatin H = 557.  
 Penostatin I = 410.  
 Pentabromopropen-2-yl dibromoacetate = 47.  
 Pentabromopropen-2-yl tribromoacetate = 48.  
*N*-(Pentacosanoyl)-2-amino-9-methyl-4-octadecene-1,3-diol = 823.  
 3*E*,14-Pentadecadiene-5,7-diyn-2-one = 252.  
 3*Z*,14-Pentadecadiene-5,7-diyn-2-one = 253.  
 3*E*-Pentadecaene-5,7-diyn-2-one = 245.  
*N*-Pentadecanoyl-(2*S*,3*R*,4*E*)-2-amino-4-octadecene-1,3-diol = 760.  
 Pericosine A = 395.  
 Pericosine B = 396.  
 Pericosine D = 397.  
 Pericosine E = 398.  
 Peroxyacarnic acid A = 336.  
 Peroxyacarnic acid B = 337.  
 Peroxyplakoric acid A<sub>1</sub> = 467.  
 Peroxyplakoric acid A<sub>2</sub> = 468.  
 Peroxyplakoric acid A<sub>3</sub> = 469.  
 Peroxyplakoric acid B<sub>1</sub> = 470.  
 Peroxyplakoric acid B<sub>3</sub> = 471.  
 Peroxyplakoric ester C = 447.  
 Petroacetylene = 255.  
 (3*S*,14*S*)-Petrocortyne A = 194.  
 Petrocortyne A = 195.  
 (3*S*,14*S*)-Petrocortyne B = 196.  
 Petrocortyne C = 338.  
 (3*S*,14*R*)-Petrocortyne E = 197.  
 Petrocortyne F = 198.  
 Petrocortyne G = 199.  
 Petrocortyne H = 200.  
 Petroformyne 10 = 256.  
 Petroraspailyne A<sub>1</sub> = 201.  
 Petroraspailyne A<sub>2</sub> = 202.  
 Petroraspailyne A<sub>3</sub> = 203.  
 Petrosiacetylene A = 204.  
 Petrosiacetylene B = 205.  
 Petrosiacetylene C = 206.  
 Petrosiacetylene D = 207.  
 Petrosiacetylene E = 208.  
 Petrosiol A = 209.  
 Petrosiol B = 210.  
 Petrosiol C = 211.  
 Petrosiol D = 212.  
 Petrosiol E = 213.  
 Petrosolic acid = 316.  
 Petrosynic acid A = 317.  
 Petrosynic acid B = 318.  
 Petrosynic acid C = 319.  
 Petrosynic acid D = 320.  
 Petrosynol = 214.  
 Petrosynone = 257.  
 Petrotetrayndiol A = 215.  
 Petrotetrayndiol B = 216.  
 Petrotetrayndiol C = 217.  
 Petrotetrayndiol D = 258.  
 Petrotetrayndiol E = 218.  
 Petrotetrayndiol F = 219.  
 Petrotetraynol A = 259.  
 Petrotetrayntriol A = 220.  
 Petrotriyniol A = 221.  
 Peyssonenyne A = 321.  
 Peyssonenyne B = 322.  
 (5*Z*)-PGA<sub>2</sub> = 564.  
 PGB<sub>2</sub> = 565.  
 PGD<sub>2</sub> = 566.  
 PGE<sub>1</sub> = 567.  
 PGE<sub>2</sub> = 568.  
 PGF<sub>2α</sub> = 569.  
 Phomolide A = 89.  
 Phomolide B = 90.  
 Phosphocalyculin C = 687.  
 Phosphoiodyn A = 339.  
 Pitinoic acid A = 127.  
 Pitinoic acid B = 128.  
 Plakevulin A = 612.  
 Plakinic acid A = 472.  
 Plakinic acid B = 473.  
*epi*-Plakinic acid E methyl ester = 474.  
 Plakinic acid F = 475.  
*epi*-Plakinic acid F = 476.  
 Plakinic acid G = 477.  
*epi*-Plakinic acid G = 478.  
*epi*-Plakinic acid H = 477.  
 Plakorin = 479.  
 Plakortide acid = 480.  
 Plakortide F = 481.  
 Plakortide G = 482.  
 (4*S*)-Plakortide H = 483.  
 Plakortide P = 484.  
 Plakortide Q = 485.  
 Plakortide R = 486.  
 Plakortide S = 487.  
 Plakortide T = 488.  
 Plakortide U = 489.  
 Plakortin = 490.  
 Plakortisinic acid = 491.

Plakortolide = 530.  
 Plakortolide B = 531.  
 Plakortolide D = 532.  
 Plakortolide E = 533.  
 Plakortolide F = 534.  
 Plakortolide F† = 535.  
 Plakortone A = 518.  
 Plakortone B = 519.  
 Plakortone C = 520.  
 Plakortone D = 521.  
 Plakortone E = 522.  
 Plakortone F = 523.  
 Plakoside A = 824.  
 Plakoside B = 825.  
 (Z)-PNG 4 = 622.  
 Pokepola ester = 688.  
 Propenediester = 91.  
 (5Z)-Prostaglandin A<sub>2</sub> = 564.  
 15-*epi*-Prostaglandin A<sub>2</sub> = 570.  
 Prostaglandin B<sub>2</sub> = 565.  
 Prostaglandin D<sub>2</sub> = 566.  
 Prostaglandin E<sub>1</sub> = 567.  
 Prostaglandin E<sub>2</sub> = 568.  
 Prostaglandin F<sub>2</sub>α = 569.  
 Pseudoalteromone B = 129.  
 Pteroenone = 130.  
 Ptilodene = 92.  
 Punaglandin 1 = 613.  
 Punaglandin 2 = 614.  
 Punaglandin 2 acetate = 615.  
 (Z)-Punaglandin 3 = 616.  
 (E)-Punaglandin 3 = 617.  
 (Z)-Punaglandin 3 acetate  
     = 618.  
 (E)-Punaglandin 3 acetate = 619.  
 (E)-Punaglandin 3 epoxide = 620.  
 (E)-Punaglandin 4 = 621.  
 (Z)-Punaglandin 4 = 622.  
 (E)-Punaglandin 4 acetate = 623.  
 (Z)-Punaglandin 4 acetate = 624.  
 (E)-Punaglandin 4 epoxide = 625.  
 Punaglandin 5 = 626.  
 Punaglandin 5 acetate = 627.  
 Punaglandin 6 = 628.  
 Punaglandin 7 = 629.  
 (5Z)-Punaglandin 8 = 630.  
 Punaglandin 1 acetate = 631.  
 Pyripyropene A = 558.  
 Pyripyropene E = 559.

R  
 Raspailyne A = 222.  
*R*-2,4-Dimethyl-22-(*p*-hydroxyphenyl)-docos-3  
     (*E*)-enoic acid = 869.  
 Rhizochalin = 826.  
 Roselipin 1A = 131.  
 Roselipin 1B = 132.  
 Roselipin 2A = 133.  
 Roselipin 2B = 134.

S  
 Santacruzamate A = 93.  
 Sarcoehrenoside A = 827.  
 Sarcoehrenoside B = 828.  
 Sarcoglycoside A = 728.  
 Sarcoglycoside B = 729.  
 Sarcoglycoside C = 730.  
 Sargussumol = 411.  
 Sequoiatone A = 545.  
 Sequoiatone B = 508.  
 Siccayne = 340.  
 Sigmosceptrellin B methyl ester = 492.  
 Siladenoserinol A = 689.  
 Siladenoserinol B = 690.  
 Siladenoserinol C = 691.  
 Siladenoserinol D = 692.  
 Siladenoserinol E = 693.  
 Siladenoserinol F = 694.  
 Siladenoserinol G = 695.  
 Siladenoserinol H = 696.  
 Siladenoserinol I = 697.  
 Siladenoserinol J = 698.  
 Siladenoserinol K = 699.  
 Siladenoserinol L = 700.  
 Sinularioside = 731.  
 Sinularone A (2012) = 376.  
 Sinularone B (2012) = 377.  
 Sinularone G (2012) = 378.  
 Sinularone H (2012) = 379.  
 Sinularone I (2012) = 380.  
 Siphonarienone = 135.  
 Siphonodiol = 223.  
 Solandelactone C = 577.  
 Solandelactone D = 578.  
 Solandelactone G = 579.  
 Spartinol C = 354.  
 Spartinoxide = 509.  
 Spongilipid = 732.  
 Sporiolide A = 839.

- Sporiolide B = 840.  
 Sporothrin A = 412.  
 Sporothrin B = 413.  
 Stearidonic acid = 94.  
*Stellaster* Cerebroside S-1-3 = 817.  
*Stellaster* Cerebroside S-1-4 = 818.  
*Stellaster* Cerebroside S-1-5 = 819.  
 Stolononic acid A = 493.  
 Stolononic acid B = 494.  
 Stolonoxide A = 495.  
 Stolonoxide B = 496.  
 Stolonoxide C = 497.  
 Stolonoxide D = 498.  
 Stolonoxide E = 499.  
 Stolonoxide F = 500.  
 7-*O*-Succinylmacrolactin F = 859.  
 7-*O*-Succinylmacrolactin A = 860.  
 2-Sulfoethyl alcohol = 9.  
 5-(12-Sulfooxyheptadecyl)-1,3-benzenediol = 875.  
 (6-Sulfoquinovopyranosyl)-(1 $\rightarrow$ 3')-1'-(5,8,11,14,17-eicosapentaenoyl)-2'-hexadecanoylglycerol = 733.  
 Swinhoiamide A = 701.  
 Symbioramide = 829.  
 Syriacin = 830.
- T**
- Tanikolide dimer = 27.  
 Tanikolide secoacid = 28.  
 Taurospongins A = 323.  
 Terpioside B = 831.  
 (+)-Terrein = 381.  
 Testafuran A = 324.  
*N*-(Tetracosanoyl)-2-amino-9-methyl-4-octadecene-1,3-diol = 832.  
 13-Tetradecene-2,4-diyn-1-ol = 224.  
 4,6,8,10-Tetraethyl-4,6-dihydroxy-2,7,11-tetradecatrienoic acid = 136.  
 12,13,14,15-Tetrahydroisophonodiol = 225.  
 2,9,12,15-Tetramethyl-2,19-eicosadiene-4,7,10,13-tetrone = 96.  
 4,6,8,10-Tetramethyl-4-tridecen-3-one = 135.  
 Thiocyanatin A = 17.  
 Thiopalmyrone = 416.  
 Timnodonic acid = 66.  
 Tirandamycin A = 547.  
 Tirandamycin B = 548.  
 Topostin B 567 = 137.  
 Topsentolide A<sub>1</sub> = 640.  
 Toxadocial A = 18.  
 Toxadocial C = 49.  
 Toxadocic acid = 50.  
 (2*S*,3*S*,4*R*)-1,3,4-Triacetoxy-2-[(*R*-2'-acetoxyocatadecanoyl)amino]octadecane = 833.  
 (all-*R*)-1,12,18,29-Triacontatetrayne-3,14,17,28-tetrol = 226.  
 3*Z*,15*Z*,27*Z*-Triacontatriene-1,29-diyn-5*S*-ol = 227.  
 4,15,26-Triacontatriene-1,12,18,29-tetrayne-3,14,17,28-tetrol = 214.  
 4,15,26-Triacontatriene-1,12,18,29-tetrayne-3,14,17,28-tetrone = 257.  
 (all-*Z*)-5,9,23-Triacontatrienoic acid methyl ester = 95.  
 15-Triacontene-1,12,18,29-tetrayne-3,28-diol = 154.  
 Triangulyne A = 228.  
 Triangulyne B = 229.  
 Triangulyne C = 230.  
 Triangulyne D = 231.  
 Triangulyne E = 232.  
 Triangulyne F = 233.  
 Triangulyne G = 234.  
 Triangulyne H = 235.  
 Triangulynic acid = 325.  
 (2*R*)-2-(2,3,6-Tribromo-4,5-dihydroxybenzyl)cyclohexanone = 382.  
 Trichodenone A = 383.  
 Trichodenone B = 384.  
 (*R*)-Trichodenone C = 385.  
 Trichodermatide A = 560.  
 Trichoderone = 386.  
 (2*R*,14*Z*,20*Z*)-14,20-Tricosadiene-3,5,10,12,22-pentayne-1,2-diol = 223.  
 (2*R*,14*Z*,20*Z*)-14,20-Tricosadiene-3,5,10,12,22-pentayne-1,2-diol-di-*O*-sulfate = 328.  
 14,20-Tricosadiene-3,5,10,12,22-pentayne-1,2,9-triol = 149.  
 (2*ξ*,14*E*,16*ξ*,20*Z*)-14,20-Tricosadiene-3,5,10,12,22-pentayne-1,2,16-triol = 153.  
*N*-(Tricosanoyl)-2-amino-9-methyl-4-octadecene-1,3-diol = 834.  
*N*-Tricosanoyl-(2*ξ*,3*ξ*,4*E*)-2-amino-4-octadecene-1,3-diol = 762.  
 (2*E*,4*E*)-2-Tridecyl-heptadeca-2,4-dienal = 138.

3-Tridecylphenol = 876.  
6-Tridecylsalicylic acid = 877.  
4,6,10-Triethyl-4,6-dihydroxy-8-methyl-  
2,7,11-tetradecatrienoic acid = 139.  
4,6,8-Triethyl-2,4,9-dodecatrienoic acid  
= 125.  
(2*S*,3*S*,4*R*)-1,3,4-Trihydroxy-2-(2-(*R*)-  
hydroxyoctadecanoyl-amino)octadec-  
8*E*-ene = 835.  
(2*S*,3*S*,4*R*)-1,3,4-Trihydroxy-2-[(*R*-2'-  
hydroxytetradecanoyl)amino]  
tricosane = 836.  
14,17,28-Trihydroxy-4,15,26-triacontatriene-  
1,12,18,29-tetraen-3-one = 236.  
2,6,10-Trimethyl-5,9-undecadienal = 140.  
Trisialo-ganglioside HPG-1 = 837.

## U

Umbraculumin A = 656.  
Umbraculumin C = 657.  
(3*E*,5*Z*,8*Z*)-Undeca-1,3,5,8-tetraene = 37.  
Unsaturated fatty acid glycerol ester 3 = 648.

Unsaturated fatty acid glycerol ester 4 = 649.  
Unsaturated fatty acid glycerol ester 5 = 650.  
Unsaturated fatty acid glycerol ester 6 = 651.  
Unsaturated fatty acid glycerol ester 7 = 652.  
Unsaturated fatty acid glycerol ester 8 = 653.  
Unsaturated fatty acid glycerol ester 9 = 654.

## W

Wailupemycin A = 387.  
Woodylide A = 141.  
Woodylide B = 142.  
Woodylide C = 143.

## X

Xestospongic acid = 277.  
Xestospongic acid ethyl ester = 326.  
Xyloketal A = 561.  
Xyloketal F = 562.

## Y

Yanuthone D = 388.  
Yendolipin = 838.

## Index 2 Compound Molecular Formula Index

The Molecular Formula Index of Volume 6 lists the molecular formulae of all 890 active isolated compounds from marine organisms given in the **HAMNP Volume 6** in Hill convention order. Under a bold formula, all related compound names following code numbers are listed in the code number order too.

### **C<sub>2</sub>**

#### **C<sub>2</sub>H<sub>6</sub>O<sub>4</sub>S**

– Isethionic acid, 9.

### **C<sub>5</sub>**

#### **C<sub>5</sub>Br<sub>8</sub>O<sub>2</sub>**

– Pentabromopropen-2-yl tribromoacetate, 48.

#### **C<sub>5</sub>HBr<sub>7</sub>O<sub>2</sub>**

– Pentabromopropen-2-yl dibromoacetate, 47.

#### **C<sub>5</sub>H<sub>8</sub>O<sub>3</sub>**

– Laurencione (open-chain form), 10.

#### **C<sub>5</sub>H<sub>11</sub>O<sub>2</sub>S<sup>1+</sup>**

– (2-Carboxyethyl)dimethylsulfonium(1+), 3.

### **C<sub>6</sub>**

#### **C<sub>6</sub>H<sub>10</sub>O<sub>2</sub>S**

– Gonyauline, 389.

#### **C<sub>6</sub>H<sub>12</sub>NO<sub>2</sub><sup>1+</sup>**

– 4-Azoniaspiro[3.3]heptane-2,6-diol, 510.

#### **C<sub>6</sub>H<sub>14</sub>O<sub>4</sub>S**

– Monohexyl sulfate, 14.

### **C<sub>7</sub>**

#### **C<sub>7</sub>H<sub>6</sub>O<sub>4</sub>**

– Patulin, 517.

#### **C<sub>7</sub>H<sub>8</sub>O<sub>2</sub>**

– Trichodenone A, 383.

#### **C<sub>7</sub>H<sub>8</sub>O<sub>4</sub>**

– (+)-Epoxydon, 364.

– (+)-*epi*-Epoxydon, 365.

#### **C<sub>7</sub>H<sub>9</sub>ClO<sub>2</sub>**

– (*R*)-Trichodenone C, 385.

#### **C<sub>7</sub>H<sub>9</sub>ClO<sub>3</sub>**

– Trichodenone B, 384.

#### **C<sub>7</sub>H<sub>10</sub>O<sub>3</sub>**

– Trichoderone, 386.

#### **C<sub>7</sub>H<sub>10</sub>O<sub>3</sub>S**

– Thiopalmyrone, 416.

### **C<sub>8</sub>**

#### **C<sub>8</sub>H<sub>7</sub>BrO<sub>4</sub>**

– 4-Acetoxy-2-bromo-5,6-epoxy-2-cyclohexen-1-one, 355.

#### **C<sub>8</sub>H<sub>7</sub>Cl<sub>2</sub>NO<sub>3</sub>**

– Dichloroverongiaquinol, 359.

#### **C<sub>8</sub>H<sub>7</sub>NO<sub>3</sub>**

– Coixol, 525.

#### **C<sub>8</sub>H<sub>8</sub>O<sub>4</sub>**

– 1-Hydroxy-4-oxo-2,5-cyclohexadiene-1-acetic acid, 368.

#### **C<sub>8</sub>H<sub>9</sub>NO<sub>3</sub>**

– Myrothenone A, 371.

#### **C<sub>8</sub>H<sub>10</sub>O<sub>3</sub>**

– (+)-Terrein, 381.

#### **C<sub>8</sub>H<sub>10</sub>O<sub>5</sub>**

– (*R*)-Kjellmanianone, 393.

– (+)-Kjellmanianone, 394.

#### **C<sub>8</sub>H<sub>11</sub>ClO<sub>5</sub>**

– Pericosine A, 395.

– Pericosine D, 397.

#### **C<sub>8</sub>H<sub>12</sub>**

– Fucoserratene, 38.

#### **C<sub>8</sub>H<sub>12</sub>Cl<sub>2</sub>O**

– (1*E*,5*Z*)-1,6-Dichloro-2-methyl-1,5-heptadien-3-ol, 105.

#### **C<sub>8</sub>H<sub>12</sub>O<sub>3</sub>**

– Leptosphaerone C, 352.

#### **C<sub>8</sub>H<sub>14</sub>O**

– 7-Methyloct-4-en-3-one, 124.

#### **C<sub>8</sub>H<sub>16</sub>O<sub>4</sub>S**

– (*E*)-5-Octenyl sulfate, 46.

#### **C<sub>8</sub>H<sub>18</sub>O<sub>4</sub>S**

– 6-Methylheptyl sulfate, 26.

### **C<sub>9</sub>**

#### **C<sub>9</sub>H<sub>9</sub>NO<sub>2</sub>**

– Homothallin, 391.

#### **C<sub>9</sub>H<sub>10</sub>O<sub>4</sub>**

– Jacaranone, 369.

- C<sub>9</sub>H<sub>13</sub>ClO<sub>5</sub>**  
– Honaucin C, 69.
- C<sub>9</sub>H<sub>14</sub>O<sub>3</sub>**  
– *epi*-Aspinonediol, 99.
- C<sub>9</sub>H<sub>14</sub>O<sub>6</sub>**  
– Pericosine B, 396.
- C<sub>9</sub>H<sub>16</sub>O**  
– 2,6-Dimethyl-5-heptenal, 106.
- C<sub>9</sub>H<sub>16</sub>O<sub>2</sub>**  
– 4-Hydroxynon-2-enal, 42.
- C<sub>9</sub>H<sub>16</sub>O<sub>3</sub>**  
– Aspinotriol A, 101.  
– Aspinotriol B, 102.
- C<sub>9</sub>H<sub>16</sub>O<sub>4</sub>**  
– Aspinonene, 100.
- C<sub>9</sub>H<sub>19</sub>NO<sub>7</sub>**  
– 1-*O*-(4-Amino-4-deoxy- $\alpha$ -*D*-mannopyranosyl) glycerol, 702.
- C<sub>9</sub>H<sub>20</sub>NO<sub>2</sub><sup>1+</sup>**  
– (4-Methoxycarbonylbutyl)-trimethylammonium chloride, 11.
- C<sub>9</sub>H<sub>20</sub>O<sub>4</sub>S**  
– 2,6-Dimethylheptyl sulfate, 22.
- C<sub>10</sub>**
- C<sub>10</sub>H<sub>15</sub>ClO<sub>5</sub>**  
– Honaucin B, 68.
- C<sub>10</sub>H<sub>16</sub>O<sub>3</sub>**  
– leodomycin D, 79.
- C<sub>10</sub>H<sub>16</sub>O<sub>4</sub>S**  
– 3*Z*,6*Z*,9-Decatrien-1-ol-*O*-sulfate, 36.
- C<sub>10</sub>H<sub>18</sub>O<sub>3</sub>**  
– (3*Z*,5*R*)-5-Hydroxy-3-decenoic acid, 74.
- C<sub>10</sub>H<sub>18</sub>O<sub>4</sub>S**  
– 4*Z*,7*Z*-Decadien-1-ol-*O*-sulfate, 34.
- C<sub>10</sub>H<sub>20</sub>O<sub>4</sub>**  
– (3*R*,5*S*)-3,5-Dihydroxydecanoic acid, 5.
- C<sub>11</sub>**
- C<sub>11</sub>H<sub>10</sub>O<sub>2</sub>**  
– Siccayne, 340.
- C<sub>11</sub>H<sub>10</sub>O<sub>3</sub>**  
– (*E*)-7,7*a*-Dihydro-5-hydroxy-7-(2-propenylidene) cyclopenta[*c*]pyran-6(2*H*)-one, 506.  
– (*Z*)-7,7*a*-Dihydro-5-hydroxy-7-(2-propenylidene) cyclopenta[*c*]pyran-6(2*H*)-one, 507.
- C<sub>11</sub>H<sub>12</sub>O<sub>4</sub>**  
– Didemnenone A, 360.  
– Didemnenone B, 361.
- C<sub>11</sub>H<sub>14</sub>**  
– Desmarestene, 343.
- C<sub>11</sub>H<sub>14</sub>O**  
– Caudoxirene, 342.
- C<sub>11</sub>H<sub>14</sub>O<sub>3</sub>**  
– Nakienone A, 372.  
– Nakienone B, 373.
- C<sub>11</sub>H<sub>14</sub>O<sub>4</sub>**  
– Didemnenone C, 362.  
– Didemnenone D, 363.
- C<sub>11</sub>H<sub>16</sub>**  
– Finavarrene, 37.  
– Ectocarpene, 346.  
– (+)-(*E*)-(3*S*,4*S*)-Multifidene, 348.  
– (+)-(*Z*)-(3*S*,4*S*)-Multifidene, 349.
- C<sub>11</sub>H<sub>16</sub>O<sub>5</sub>**  
– Sinularone G (2012), 378.
- C<sub>11</sub>H<sub>17</sub>NO<sub>8</sub>**  
– Neodysiherbaine A, 515.
- C<sub>11</sub>H<sub>18</sub>**  
– Cystophorene, 33.  
– (+)-(3*S*,4*S*)-3-*n*-Butyl-4-vinylcyclopentene, 341.  
– Dictyoptere A, 344.  
– (*R*)-Dictyoptere C', 345.
- C<sub>11</sub>H<sub>18</sub>O<sub>3</sub>**  
– 5 $\beta$ -Hydroxy-3,4-dimethyl-5-pentyl-2(5*H*)-furanon, 367.
- C<sub>11</sub>H<sub>18</sub>O<sub>4</sub>**  
– (*S*)-Hexylitaconic acid, 119.
- C<sub>11</sub>H<sub>20</sub>O<sub>2</sub>**  
– Pitinoic acid A, 127.
- C<sub>11</sub>H<sub>22</sub>O<sub>4</sub>S**  
– (3*Z*)-4,8-Dimethylnon-3-eb-1-yl sulfate, 107.
- C<sub>12</sub>**
- C<sub>12</sub>H<sub>13</sub>ClO<sub>2</sub>**  
– Aurantoic acid, 60.
- C<sub>12</sub>H<sub>14</sub>O<sub>3</sub>**  
– Bruguierol C, 537.
- C<sub>12</sub>H<sub>16</sub>O**  
– Montiporyne G, 181.
- C<sub>12</sub>H<sub>16</sub>O<sub>3</sub>**  
– Phomolide A, 89.
- C<sub>12</sub>H<sub>18</sub>**  
– Hormosirene, 347.

- C<sub>12</sub>H<sub>18</sub>O**  
– 2,4-Dodecadiyn-1-ol, 160.
- C<sub>12</sub>H<sub>18</sub>O<sub>3</sub>**  
– leodomycin B, 121.
- C<sub>12</sub>H<sub>18</sub>O<sub>4</sub>**  
– Phomolide B, 90.
- C<sub>12</sub>H<sub>18</sub>O<sub>5</sub>**  
– Sinularone H (2012), 379.
- C<sub>12</sub>H<sub>20</sub>N<sub>2</sub>O<sub>7</sub>**  
– Dysiherbaine, 513.
- C<sub>12</sub>H<sub>20</sub>O<sub>4</sub>**  
– leodomycin C, 78.  
– 2-Hexylidene-3-methylsuccinic acid, 118.
- C<sub>12</sub>H<sub>22</sub>O<sub>2</sub>S<sub>2</sub>**  
– Hedathiosulfonic acid B, 117.
- C<sub>12</sub>H<sub>24</sub>O<sub>2</sub>S<sub>2</sub>**  
– Hedathiosulfonic acid A, 116.
- C<sub>12</sub>H<sub>25</sub>NO**  
– Halaminol B 2-Amino-11-dodecen-3-ol, 40.
- C<sub>12</sub>H<sub>25</sub>NO<sub>4</sub>**  
– Terpioside B, 831.
- C<sub>12</sub>H<sub>26</sub>O<sub>3</sub>**  
– 1-Butoxy-2-methyl-1-(2-methylpropoxy)-2-propanol, 20.
- C<sub>13</sub>**
- C<sub>13</sub>H<sub>13</sub>Br<sub>3</sub>O<sub>3</sub>**  
– (2*R*)-2-(2,3,6-Tribromo-4,5-dihydroxybenzyl)cyclohexanone, 382.
- C<sub>13</sub>H<sub>16</sub>O<sub>5</sub>**  
– Acremostictin, 536.
- C<sub>13</sub>H<sub>22</sub>O<sub>4</sub>**  
– leodomycin A, 120.
- C<sub>13</sub>H<sub>22</sub>O<sub>5</sub>**  
– Penicimonoterpene, 126.  
– Sporiolide B, 840.
- C<sub>13</sub>H<sub>24</sub>O<sub>2</sub>**  
– 2-Heptyl-1-cyclopropanepropanoic acid, 390.
- C<sub>13</sub>H<sub>24</sub>O<sub>3</sub>**  
– (-)-7-Methoxydodec-4(*E*)-enoic acid, 82.
- C<sub>13</sub>H<sub>25</sub>ClO<sub>2</sub>**  
– (-)-(*E*)-1-Chlorotridec-1-ene-6,8-diol, 32.
- C<sub>13</sub>H<sub>25</sub>NO**  
– 1-Amino-4,12-tridecadien-2-ol, 30.
- C<sub>13</sub>H<sub>27</sub>NO**  
– (2*R*,5*E*)-1-Amino-5-tridecen-2-ol, 31.  
– (2*S*,4*E*)-1-Amino-4-tridecen-2-ol, 746.
- C<sub>14</sub>**
- C<sub>14</sub>H<sub>15</sub>NO<sub>7</sub>**  
– JBIR 58, 541.
- C<sub>14</sub>H<sub>16</sub>O<sub>7</sub>**  
– Delessierine, 512.
- C<sub>14</sub>H<sub>18</sub>O<sub>4</sub>**  
– Penicillone A, 408.
- C<sub>14</sub>H<sub>20</sub>O**  
– 13-Tetradecene-2,4-diyn-1-ol, 224.
- C<sub>14</sub>H<sub>20</sub>O<sub>2</sub>**  
– Montiporyne H, 182.
- C<sub>14</sub>H<sub>20</sub>O<sub>3</sub>**  
– Montiporic acid A, 306.
- C<sub>14</sub>H<sub>20</sub>O<sub>4</sub>**  
– Aspergillide C, 59.
- C<sub>14</sub>H<sub>22</sub>O<sub>4</sub>**  
– Aspergillide A, 57.  
– Aspergillide B, 58.  
– Nigrosporanene A, 350.  
– Nigrosporanene B, 351.
- C<sub>14</sub>H<sub>24</sub>O**  
– 2,6,10-Trimethyl-5,9-undecadienal, 140.
- C<sub>14</sub>H<sub>24</sub>O<sub>2</sub>**  
– Pteroenone, 130.
- C<sub>14</sub>H<sub>24</sub>O<sub>4</sub>**  
– 6-Butyl-6-ethyl-4-ethylidene-1,2-dioxan-3-acetic acid, 422.
- C<sub>14</sub>H<sub>26</sub>O<sub>4</sub>**  
– 6-Butyl-4,6-diethyl-1,2-dioxan-3-acetic acid, 421.
- C<sub>14</sub>H<sub>27</sub>NO**  
– (2*R*,3*R*)-Aminotetradeca-5,7-dien-3-ol, 744.  
– (2*R*,3*S*)-Aminotetradeca-5,7-dien-3-ol, 745.
- C<sub>14</sub>H<sub>28</sub>O<sub>2</sub>**  
– 2,5-Dimethyldodecanoic acid, 21.
- C<sub>14</sub>H<sub>29</sub>NO**  
– 2-Amino-5-tetradecen-3-ol, 29.  
– Halaminol A, 39.
- C<sub>15</sub>**
- C<sub>15</sub>H<sub>15</sub>BrO<sub>2</sub>**  
– Panacene, 890.
- C<sub>15</sub>H<sub>16</sub>BrClO<sub>2</sub>**  
– (12*E*)-Lembyne A, 888.  
– (12*Z*)-Lembyne A, 889.
- C<sub>15</sub>H<sub>18</sub>BrClO<sub>2</sub>**  
– Chondriol, 881.
- C<sub>15</sub>H<sub>18</sub>O**  
– Montiporyne L, 252.

- Montiporyne M, 253.
- Dehydroeuryspongina A, 538.
- C<sub>15</sub>H<sub>19</sub>Br<sub>2</sub>ClO**
- *cis*-Dactylone, 882.
- Isodactylone, 883.
- C<sub>15</sub>H<sub>19</sub>Br<sub>3</sub>O<sub>3</sub>**
- Aplyparvunin, 878.
- C<sub>15</sub>H<sub>19</sub>ClO**
- Brasilenyne, 879.
- C<sub>15</sub>H<sub>20</sub>BrClO**
- *cis*-Isodihydrorhodophytin, 884.
- Isolaurepinnacin, 885.
- Laurepinnacin, 887.
- C<sub>15</sub>H<sub>20</sub>BrClO<sub>2</sub>**
- (3*Z*)-Chlorofucin, 880.
- C<sub>15</sub>H<sub>20</sub>O**
- Montiporyne A, 245.
- Montiporyne B, 246.
- C<sub>15</sub>H<sub>20</sub>O<sub>2</sub>**
- Montiporyne J, 250.
- C<sub>15</sub>H<sub>21</sub>BrO<sub>3</sub>**
- Laurefurenyne F, 886.
- C<sub>15</sub>H<sub>22</sub>N<sub>2</sub>O<sub>3</sub>**
- Santacruzamate A, 93.
- C<sub>15</sub>H<sub>22</sub>O<sub>2</sub>**
- Montiporyne I, 249.
- C<sub>15</sub>H<sub>22</sub>O<sub>3</sub>**
- Methyl montiporate A, 305.
- C<sub>15</sub>H<sub>24</sub>Cl<sub>6</sub>O<sub>4</sub>S**
- Hexachlorosulfolipid, 41.
- C<sub>15</sub>H<sub>24</sub>O<sub>2</sub>**
- Sinularone A (2012), 376.
- C<sub>15</sub>H<sub>24</sub>O<sub>3</sub>**
- Petroraspailyne A<sub>1</sub>, 201.
- C<sub>15</sub>H<sub>26</sub>O<sub>3</sub>**
- Pseudoalteromone B, 129.
- C<sub>15</sub>H<sub>28</sub>O<sub>3</sub>**
- Lyngbic acid, 81.
- C<sub>15</sub>H<sub>30</sub>O<sub>3</sub>**
- 2-Methoxytetradecanoic acid, 12.
  
- C<sub>16</sub>**
- C<sub>16</sub>H<sub>16</sub>O**
- Navenone B, 873.
- C<sub>16</sub>H<sub>16</sub>O<sub>2</sub>**
- Navenone C, 874.
- C<sub>16</sub>H<sub>16</sub>O<sub>6</sub>**
- Penicillenone, 375.
  
- C<sub>16</sub>H<sub>20</sub>Br<sub>2</sub>O<sub>2</sub>**
- (7*E*,15*Z*)-14,16-Dibromo-7,13,15-hexadecatrien-5-ynoic acid, 292.
- C<sub>16</sub>H<sub>20</sub>O<sub>5</sub>**
- Botryosphaerin F, 550.
- C<sub>16</sub>H<sub>20</sub>O<sub>6</sub>**
- Penicitrinol K, 544.
- C<sub>16</sub>H<sub>20</sub>O<sub>8</sub>**
- Macrosphelide L, 846.
- C<sub>16</sub>H<sub>21</sub>ClO<sub>10</sub>**
- Pericosine E, 398.
- C<sub>16</sub>H<sub>22</sub>O**
- 13,15-Hexadecadiene-2,4-diyne-1-ol, 164.
- C<sub>16</sub>H<sub>22</sub>O<sub>2</sub>**
- Aplyolide A, 52.
- C<sub>16</sub>H<sub>22</sub>O<sub>3</sub>**
- Montiporic acid B, 307.
- A82775C enantiomer, 327.
- Spartinoxide, 509.
- C<sub>16</sub>H<sub>22</sub>O<sub>4</sub>**
- Penicitrinol E, 543.
- C<sub>16</sub>H<sub>22</sub>O<sub>7</sub>**
- Macrosphelide F, 843.
- Macrosphelide G, 844.
- C<sub>16</sub>H<sub>22</sub>O<sub>8</sub>**
- Macrosphelide A, 841.
- Macrosphelide E, 842.
- Macrosphelide M, 847.
- C<sub>16</sub>H<sub>23</sub>BrO<sub>2</sub>**
- 16-Bromo-7,15-hexadecadiene-5-ynoic acid, 265.
- C<sub>16</sub>H<sub>23</sub>Br<sub>2</sub>NO<sub>2</sub>**
- Motualevic acid F, 414.
- C<sub>16</sub>H<sub>24</sub>IO<sub>4</sub>P**
- Phosphoiodyn A, 339.
- C<sub>16</sub>H<sub>25</sub>ClO<sub>4</sub>**
- Pitinoic acid B, 128.
- C<sub>16</sub>H<sub>26</sub>O<sub>3</sub>**
- Petroraspailyne A<sub>2</sub>, 202.
- C<sub>16</sub>H<sub>26</sub>O<sub>4</sub>**
- Sinularone B (2012), 377.
- Gracilioether H, 546.
- C<sub>16</sub>H<sub>26</sub>O<sub>6</sub>**
- Manadoperoxide C, 447.
- C<sub>16</sub>H<sub>26</sub>O<sub>7</sub>**
- Manadoperoxide G, 450.
- C<sub>16</sub>H<sub>28</sub>O<sub>4</sub>**
- Ethyl didehydroplakortide Z, 437.



**C<sub>16</sub>H<sub>30</sub>O<sub>2</sub>**

– Methyl myristate, 13.

**C<sub>16</sub>H<sub>30</sub>O<sub>4</sub>**

– Ethyl plakortide Z, 438.

**C<sub>17</sub>****C<sub>17</sub>H<sub>21</sub>BrO<sub>2</sub>**

– Bromotheoynic acid, 286.

**C<sub>17</sub>H<sub>22</sub>O**

– Montiporyne C, 247.

– Montiporyne D, 248.

**C<sub>17</sub>H<sub>22</sub>O<sub>4</sub>**

– Clavirin I, 356.

– Clavirin II, 357.

**C<sub>17</sub>H<sub>23</sub>NO**

– Montiporyne E, 335.

**C<sub>17</sub>H<sub>24</sub>O<sub>2</sub>**

– Montiporyne K, 251.

**C<sub>17</sub>H<sub>27</sub>NO<sub>5</sub>**

– Awajanomycin, 524.

**C<sub>17</sub>H<sub>28</sub>O<sub>3</sub>**

– Petroraspailyne A<sub>3</sub>, 203.

**C<sub>17</sub>H<sub>28</sub>O<sub>5</sub>**

– Manadic acid A, 443.

– Peroxyplakoric acid A<sub>3</sub>, 469.

– Peroxyplakoric acid B<sub>3</sub>, 471.

**C<sub>17</sub>H<sub>30</sub>O<sub>3</sub>**

– 9-Oxo-10-octadecenoic acid, 87.

**C<sub>17</sub>H<sub>30</sub>O<sub>4</sub>**

– 4,6-Diethyl-3,6-dihydro-6-(2-methylhexyl)-1,2-dioxin-3-acetic acid, 428.

– 4,6-Diethyl-6-hexyl-3,6-dihydro-1,2-dioxin-

3-acetic acid Me ester, 431.

– Plakortid acid, 480.

**C<sub>17</sub>H<sub>32</sub>O**

– Siphonarienone, 135.

**C<sub>17</sub>H<sub>32</sub>O<sub>3</sub>**

– (Z)-2-Methoxyhexadec-5-enoic acid, 83.

– (Z)-2-Methoxyhexadec-6-enoic acid, 84.

**C<sub>17</sub>H<sub>32</sub>O<sub>4</sub>**

– Woodylide C, 143.

**C<sub>17</sub>H<sub>34</sub>O<sub>4</sub>**

– Tanikolide secoacid, 28.

**C<sub>17</sub>H<sub>36</sub>O<sub>4</sub>S**

– 1-Heptadecanyl-O-sulfate, 7.

**C<sub>18</sub>****C<sub>18</sub>H<sub>17</sub>BrO<sub>2</sub>**

– 18-Bromo-9E,13E,17E-octadecatriene-5,7,15-triynoic acid, 284.

– 18-Bromo-9,13,17-octadecatriene-5,7,15-triynoic acid, 285.

**C<sub>18</sub>H<sub>19</sub>BrO<sub>2</sub>**

– 18-Bromo-9E,15E-octadecadiene-5,7,17-triynoic acid, 269.

– 18-Bromo-9E,17E-octadecadiene-5,7,15-triynoic acid, 270.

– 18-Bromo-13E,17E-octadecadiene-5,7,15-triynoic acid, 271.

– 18-Bromo-13E,17Z-octadecadiene-5,7,15-triynoic acid, 272.

– 18-Bromo-13Z,17E-octadecadiene-5,7,15-triynoic acid, 273.

– 18-Bromo-9,17E-octadecadiene-5,7,15-triynoic acid, 274.

– 18-Bromo-9,17Z-octadecadiene-5,7,15-triynoic acid, 275.

**C<sub>18</sub>H<sub>20</sub>O<sub>2</sub>S**

– 6-[5-(5-Octen-7-ynyl)-2-thienyl]-5-hexynoic acid, 308.

**C<sub>18</sub>H<sub>21</sub>BrO<sub>2</sub>**

– 18-Bromo-17Z-octadecadiene-5,7,15-triynoic acid, 276.

– 18-Bromo-17E-octadecadiene-5,7,15-triynoic acid, 277.

– 18-Bromo-5Z,9E,17E-octadecatriene-7,15-diynoic acid, 280.

– 18-Bromo-7E,13E,17E-octadecatriene-5,15-diynoic acid, 281.

– 18-Bromo-9E,13E,17E-octadecatriene-7,15-diynoic acid, 282.

– 18-Bromo-9E,13Z,17E-octadecatriene-7,15-diynoic acid, 283.

**C<sub>18</sub>H<sub>22</sub>Br<sub>2</sub>O<sub>2</sub>**

– 18,18-Dibromo-9Z,17E-octadecadiene-5,7-diynoic acid, 293.

**C<sub>18</sub>H<sub>22</sub>O<sub>3</sub>**

– 4-(10-Acetoxy-3,5,7-decatrienyl)phenol., 862.

**C<sub>18</sub>H<sub>23</sub>BrO<sub>2</sub>**

– 18-Bromo-9E,17E-octadecadiene-5,7-diynoic acid, 266.

– 18-Bromo-9E,17E-octadecadiene-7,15-diynoic acid, 267.

- 18-Bromo-9Z,17E-octadecadiene-7,15-diynoic acid, 268.
- C<sub>18</sub>H<sub>24</sub>O**
  - Montiporyne F, 370.
- C<sub>18</sub>H<sub>24</sub>O<sub>8</sub>**
  - Macrosphelide H, 845.
- C<sub>18</sub>H<sub>25</sub>BrO<sub>3</sub>**
  - Testafuran A, 324.
- C<sub>18</sub>H<sub>26</sub>Br<sub>2</sub>O<sub>2</sub>**
  - (Z)-18,18-Dibromo-5,17-octadecadien-7-ynoic acid, 294.
- C<sub>18</sub>H<sub>26</sub>O<sub>2</sub>**
  - Heterofibrin A<sub>1</sub>, 296.
  - Liagoric acid, 303.
- C<sub>18</sub>H<sub>26</sub>O<sub>3</sub>**
  - Ecklonialactone A, 606.
- C<sub>18</sub>H<sub>27</sub>BrO<sub>2</sub>**
  - 18-Bromo-5Z,17E-octadecadien-7-ynoic acid, 278.
- C<sub>18</sub>H<sub>28</sub>O<sub>2</sub>**
  - Stearidonic acid, 94.
- C<sub>18</sub>H<sub>28</sub>O<sub>3</sub>**
  - Aplyolide C, 54.
  - Aplyolide E, 56.
  - (9Z,12Z)-7-Hydroxyoctadeca-9,12-dien-5-ynoic acid, 302.
  - Ecklonialactone B, 607.
  - Mueggelone, 638.
- C<sub>18</sub>H<sub>28</sub>O<sub>5</sub>**
  - 2-Demethyl-4-peroxyplakoenic acid A<sub>1</sub> methyl ester, 427.
- C<sub>18</sub>H<sub>28</sub>O<sub>7</sub>**
  - Methyl-6-methoxy-3,6:10,13-diperoxy-4,11-hexadecadienoate, 458.
- C<sub>18</sub>H<sub>30</sub>O<sub>3</sub>**
  - Aplyolide B, 53.
  - Aplyolide D, 55.
  - (9R,10E,12Z,15Z)-9-Hydroxy-10,12,15-octadecatrienoic acid, 77.
  - Plakortone E, 522.
- C<sub>18</sub>H<sub>30</sub>O<sub>4</sub>**
  - (9Z,11R,12S,13S,15Z)-12,13-Epoxy-11-hydroxy-octadeca-9,15-dienoic acid, 67.
  - Haterumadioxin A, 439.
- C<sub>18</sub>H<sub>30</sub>O<sub>5</sub>**
  - (–)-Manadic acid B, 444.
  - (+)-Manadic acid B, 445.
  - Peroxyplakoric acid A<sub>1</sub>, 467.
- Peroxyplakoric acid A<sub>2</sub>, 468.
- Peroxyplakoric acid B<sub>1</sub>, 470.
- C<sub>18</sub>H<sub>30</sub>O<sub>7</sub>**
  - Manadoperoxide I, 452.
- C<sub>18</sub>H<sub>32</sub>N<sub>2</sub>OS<sub>2</sub>**
  - Thiocyanatin A, 17.
- C<sub>18</sub>H<sub>32</sub>O<sub>2</sub>**
  - Linoleate, 80.
  - Monotriajaponide A, 125.
- C<sub>18</sub>H<sub>32</sub>O<sub>3</sub>**
  - 10-Oxo-8-octadecenoic acid, 88.
- C<sub>18</sub>H<sub>32</sub>O<sub>4</sub>**
  - Haterumadioxin B, 440.
  - Plakortin, 490.
  - Unsaturated fatty acid glycerol ester 6, 651.
- C<sub>18</sub>H<sub>34</sub>O<sub>2</sub>**
  - Oleinic acid, 86.
- C<sub>18</sub>H<sub>34</sub>O<sub>4</sub>**
  - Woodylide A, 141.
- C<sub>18</sub>H<sub>34</sub>O<sub>7</sub>**
  - R-3-Hydroxyundecanoic acid methylester-3-O- $\alpha$ -L-rhamnopyranoside, 8.
- C<sub>18</sub>H<sub>37</sub>NO<sub>2</sub>**
  - Jaspine B, 809.
- C<sub>18</sub>H<sub>38</sub>O<sub>4</sub>S**
  - Octadecyl hydrogen sulfate, 16.
- C<sub>19</sub>**
- C<sub>19</sub>H<sub>24</sub>O<sub>6</sub>**
  - Sporiolide A, 839.
- C<sub>19</sub>H<sub>25</sub>BrO<sub>2</sub>**
  - Methyl-18-Bromo-9E,17E-octadecadiene-5,7-diynoate, 304.
- C<sub>19</sub>H<sub>28</sub>Br<sub>2</sub>O<sub>2</sub>**
  - 18,18-Dibromo-5Z,17-octadecadien-7-ynoic acid methyl ester, 295.
- C<sub>19</sub>H<sub>28</sub>O<sub>2</sub>**
  - Heterofibrin B<sub>1</sub>, 299.
- C<sub>19</sub>H<sub>29</sub>BrO<sub>2</sub>**
  - 18-Bromo-5Z,17E-octadecadien-7-ynoic acid methyl ester, 279.
- C<sub>19</sub>H<sub>30</sub>O<sub>3</sub>**
  - Hippolachnin A, 540.
- C<sub>19</sub>H<sub>30</sub>O<sub>4</sub>**
  - Spartinol C, 354.
- C<sub>19</sub>H<sub>30</sub>O<sub>6</sub>**
  - Gracilioether K, 551.

- C<sub>19</sub>H<sub>31</sub>ClO<sub>7</sub>**  
– Manadoperoxide J, 453.
- C<sub>19</sub>H<sub>32</sub>O**  
– 3-Tridecylphenol, 876.
- C<sub>19</sub>H<sub>32</sub>O<sub>4</sub>**  
– 10,15-Cyclo-4,7-epidioxy-1-nor-11(18)-phyten-2-oic acid, 426.  
– Nuapapuin A, 464.  
– Plakortide R, 486.
- C<sub>19</sub>H<sub>32</sub>O<sub>5</sub>**  
– 12-Isomanadoperoxide B, 442.  
– Manadoperoxide B, 446.
- C<sub>19</sub>H<sub>34</sub>O<sub>2</sub>**  
– Methyl linoleate, 85.
- C<sub>19</sub>H<sub>34</sub>O<sub>4</sub>**  
– (3*S*,6*R*,8*S*)-4,6-Diethyl-3,6-dihydro-6-(2-methylhexyl)-1,2-dioxin-3-acetic acid ethyl ester, 429.  
– Monotriajaponide B, 460.  
– Plakortide Q, 485.
- C<sub>19</sub>H<sub>34</sub>O<sub>6</sub>**  
– Manadoperoxide H, 451.
- C<sub>19</sub>H<sub>34</sub>O<sub>7</sub>**  
– Manadoperoxide E, 448.  
– Manadoperoxide F, 449.
- C<sub>19</sub>H<sub>36</sub>O<sub>4</sub>**  
– Woodylide B, 142.  
– Ceratodictyol A, 705.  
– Ceratodictyol B, 706.
- C<sub>19</sub>H<sub>38</sub>O<sub>4</sub>**  
– Ceratodictyol C, 707.  
– Ceratodictyol D, 708.  
– Ceratodictyol E, 709.  
– Ceratodictyol F, 710.
- C<sub>19</sub>H<sub>39</sub>NO<sub>2</sub>**  
– 2-Amino-9,13-dimethylheptadecanoic acid, 19.
- C<sub>19</sub>H<sub>39</sub>NO<sub>3</sub>**  
– Penaresidin A, 820.  
– Penaresidin B, 821.
- C<sub>19</sub>H<sub>40</sub>O<sub>3</sub>**  
– (*R*)-Chimyl alcohol, 711.
- C<sub>20</sub>**
- C<sub>20</sub>H<sub>20</sub>O<sub>13</sub>**  
– Sargussumol, 411.
- C<sub>20</sub>H<sub>22</sub>Br<sub>2</sub>O<sub>2</sub>**  
– (5*Z*,11*E*,15*E*,19*E*)-6,20-Dibromoeicosa-5,11,15,19-tetraen-9,17-diyonic acid, 291.
- C<sub>20</sub>H<sub>22</sub>O<sub>3</sub>**  
– (12*Z*,15*Z*)-19-Ethyl-2,6-epoxy-1-oxacyclononadeca-2,5,12,15,18-pentaen-9-yn-4-one, 334.
- C<sub>20</sub>H<sub>23</sub>BrO<sub>2</sub>**  
– (*all-E*)-20-Bromo-5,11,15,19-eicosatetraene-9,17-diyonic acid, 263.
- C<sub>20</sub>H<sub>24</sub>O<sub>4</sub>**  
– 1-Acetoxy-4-(10-acetoxy-3,5,7-decatrienyl)benzene, 861.
- C<sub>20</sub>H<sub>24</sub>O<sub>5</sub>**  
– 10-(3,4-Dihydroxyphenyl)-3,5,7-decatrien-1-ol 1,3'-diacetate, 864.  
– 10-(3,4-Dihydroxyphenyl)-3,5,7-decatrien-1-ol 1,4'-diacetate, 865.
- C<sub>20</sub>H<sub>25</sub>BrO<sub>2</sub>**  
– (*all-E*)-20-Bromo-11,15,19-eicosatriene-9,17-diyonic acid, 264.  
– Xestospongic acid ethyl ester, 326.
- C<sub>20</sub>H<sub>26</sub>NO<sub>3</sub>P**  
– Diphenyl-cyclooctylphosphoramidate, 670.
- C<sub>20</sub>H<sub>28</sub>O**  
– (4*R*,7*S*,*E*)-10-Benzyl-5,7-dimethylundeca-1,5,10-trien-4-ol, 863.
- C<sub>20</sub>H<sub>28</sub>O<sub>3</sub>**  
– Bacillariolide I, 580.  
– Bacillariolide II, 581.  
– Didemnilactone A, 634.  
– Didemnilactone B, 635.  
– Topsentolide A<sub>1</sub>, 640.
- C<sub>20</sub>H<sub>28</sub>O<sub>4</sub>**  
– Ptilodene, 92.
- C<sub>20</sub>H<sub>30</sub>O<sub>2</sub>**  
– (5,8,11,14,17)-Eicosapentaenoic acid, 66.  
– (–)-(3*R*,4*E*,16*E*,18*R*)-icosa-4,16-diene-1,19-diyne-3,18-diol, 168.  
– (+)-(3*S*,4*E*,16*E*,18*S*)-Icosa-4,16-diene-1,19-diyne-3,18-diol, 169.
- C<sub>20</sub>H<sub>30</sub>O<sub>3</sub>**  
– (5*Z*,8*R*,9*E*,11*Z*,14*Z*,17*Z*)-8-Hydroxycycosa-5,9,11,14,17-pentaenoic acid, 73.  
– Ascidiatrienolide A, 633.  
– Neodidemnilactone, 639.
- C<sub>20</sub>H<sub>30</sub>O<sub>4</sub>**  
– (5*Z*)-PGA<sub>2</sub>, 564.  
– PGB<sub>2</sub>, 565.  
– 15-*epi*-Prostaglandin A<sub>2</sub>, 570.  
– Neohalicholactone, 576.  
– Amphidinolactone A, 632.

**C<sub>20</sub>H<sub>30</sub>O<sub>5</sub>S**

– Umbraculumin C, 657.

**C<sub>20</sub>H<sub>31</sub>BrO<sub>4</sub>**

– Grenadadiene, 110.

**C<sub>20</sub>H<sub>32</sub>O<sub>3</sub>**

– (5Z,8R,9E,11Z,14Z)-8-Hydroxy-5,9,11,14-eicosatetraenoic acid, 75.  
 – (12S)-12-Hydroxyeicosatetraenoic acid, 76.  
 – 6-Tridecylsalicylic acid, 877.

**C<sub>20</sub>H<sub>32</sub>O<sub>4</sub>**

– (5Z,8Z,11Z,13E,15S)-15-Hydroperoxy-5,8,11,13-eicosatetraenoic acid, 71.  
 – Debromogrenadadiene, 104.  
 – (–)-Halicholactone, 575.

**C<sub>20</sub>H<sub>32</sub>O<sub>5</sub>**

– Methyl 3,6-epidioxy-6-methoxy-4,14,16-octa-decatrienoate, 457.  
 – PGD<sub>2</sub>, 566.  
 – PGE<sub>2</sub>, 568.

**C<sub>20</sub>H<sub>34</sub>O<sub>3</sub>**

– Plakortone D, 521.

**C<sub>20</sub>H<sub>34</sub>O<sub>4</sub>**

– 6-Acetoxylinoleic acid, 51.  
 – Methyl-nuapapuanoate, 459.  
 – Nuapapuin B, 465.  
 – *epi*-Nuapapuin B, 466.

**C<sub>20</sub>H<sub>34</sub>O<sub>5</sub>**

– Aikupikoxide B, 417.  
 – PGE<sub>1</sub>, 567.  
 – PGF<sub>2α</sub>, 569.

**C<sub>20</sub>H<sub>34</sub>O<sub>6</sub>**

– Aikupikoxide C, 418.  
 – Aikupikoxide D, 419.

**C<sub>20</sub>H<sub>35</sub>ClO<sub>7</sub>**

– Manadoperoxide K, 454.

**C<sub>20</sub>H<sub>36</sub>O**

– (3S,4E)-Eicos-4-en-1-yn-3β-ol, 161.

**C<sub>20</sub>H<sub>36</sub>O<sub>4</sub>**

– Monotriajaponide C, 461.

**C<sub>20</sub>H<sub>38</sub>O<sub>2</sub>**

– Isosiphonarienolone, 122.

**C<sub>20</sub>H<sub>42</sub>O<sub>4</sub>**

– Glycerol 1-(2R-methoxyhexadecyl) ether, 722.  
 – 1-O-(2-Methoxyhexadecyl)glycerol, 724.

**C<sub>21</sub>****C<sub>21</sub>H<sub>20</sub>**

– Callyberyne A, 144.

**C<sub>21</sub>H<sub>22</sub>**

– Callyberyne B, 145.

**C<sub>21</sub>H<sub>22</sub>O<sub>8</sub>**

– Wailupemycin A, 387.

**C<sub>21</sub>H<sub>24</sub>**

– Callytetrayne, 146.

**C<sub>21</sub>H<sub>24</sub>O<sub>6</sub>**

– Paeciloxocin A, 542.

**C<sub>21</sub>H<sub>28</sub>O<sub>4</sub>**

– Capucinoic acid A, 423.

**C<sub>21</sub>H<sub>29</sub>BrO<sub>4</sub>**

– Bromovulone I, 582.  
 – Bromovulone II, 583.  
 – Bromovulone III, 584.

**C<sub>21</sub>H<sub>29</sub>ClO<sub>4</sub>**

– Chlorovulone I, 585.  
 – Chlorovulone II, 586.  
 – Chlorovulone III, 587.

**C<sub>21</sub>H<sub>29</sub>IO<sub>4</sub>**

– Iodovulone I, 609.  
 – Iodovulone II, 610.  
 – Iodovulone III, 611.

**C<sub>21</sub>H<sub>30</sub>O<sub>4</sub>**

– Heterofibrin A<sub>2</sub>, 297.  
 – 4-Deacetoxy-12-O-deacetylclavulone I, 603.  
 – 4-Deacetoxy-12-O-deacetylclavulone II, 604.  
 – 4-Deacetoxy-12-O-deacetylclavulone III, 605.

**C<sub>21</sub>H<sub>32</sub>O<sub>4</sub>**

– Methyl 9,15-dioxo-5,8(12)-prostadienoate, 563.

**C<sub>21</sub>H<sub>32</sub>O<sub>5</sub>**

– Umbraculumin A, 656.

**C<sub>21</sub>H<sub>33</sub>NO**

– Grenadamide A, 574.

**C<sub>21</sub>H<sub>34</sub>O<sub>3</sub>**

– Plakortone B, 519.

**C<sub>21</sub>H<sub>34</sub>O<sub>4</sub>**

– (5Z,8Z,11Z,13E,15S)-15-Hydroperoxy-5,8,11,13-eicosatetraenoic acid methyl ester, 72.

**C<sub>21</sub>H<sub>36</sub>O**

– (2E,6Z,9Z)-2-Methyl-2,6,9-eicosatrienal, 43.

**C<sub>21</sub>H<sub>36</sub>O<sub>3</sub>**

– Plakortone C, 520.

**C<sub>21</sub>H<sub>36</sub>O<sub>4</sub>**

– 4,6,10-Triethyl-4,6-dihydroxy-8-methyl-2,7,11-tetradecatrienoic acid, 139.  
 – Raspailyne A, 222.

**C<sub>21</sub>H<sub>36</sub>O<sub>5</sub>**

– Sinularone I (2012), 380.

**C<sub>21</sub>H<sub>38</sub>O**– (3*S*,4*E*)-3-Hydroxyheneicos-4-en-1-yne, 166.– (5*S*,3*Z*)-5-Hydroxy-16-methyleicos-3-en-1-yne, 167.**C<sub>21</sub>H<sub>38</sub>O<sub>3</sub>**

– Plakortone F, 523.

**C<sub>21</sub>H<sub>38</sub>O<sub>4</sub>**

– Monotriajaponide D, 462.

– Plakortide F, 481.

– Plakortide G, 482.

– Unsaturated fatty acid glycerol ester 3, 648.

**C<sub>21</sub>H<sub>38</sub>OS**

– Dihydrothiopyranone, 415.

**C<sub>21</sub>H<sub>40</sub>O<sub>4</sub>**

– 4,6-Diethyl-6-(2-ethyl-4-methyloctyl)-1,2-dioxane-3-acetic acid, 430.

**C<sub>21</sub>H<sub>44</sub>O<sub>3</sub>**

– Batilol, 703.

**C<sub>21</sub>H<sub>44</sub>O<sub>8</sub>S<sub>2</sub>**

– Heneicosane-1,21-diyl disulfate, 6.

**C<sub>22</sub>****C<sub>22</sub>H<sub>20</sub>O<sub>9</sub>**

– 3-Epideoxyenterocin, 539.

**C<sub>22</sub>H<sub>26</sub>O<sub>6</sub>**

– 10-(3,4-Dihydroxyphenyl)-3,5,7-decatrien-1-ol triacetate, 866.

**C<sub>22</sub>H<sub>27</sub>BrO<sub>2</sub>**– 22-Bromo-17*E*,21*E*-docosadiene-9,11,19-triynoic acid, 261.– 22-Bromo-17*E*,21*Z*-docosadiene-9,11,19-triynoic acid, 262.**C<sub>22</sub>H<sub>27</sub>NO<sub>7</sub>**

– Tirandamycin A, 547.

**C<sub>22</sub>H<sub>27</sub>NO<sub>8</sub>**

– Tirandamycin B, 548.

**C<sub>22</sub>H<sub>28</sub>O<sub>2</sub>**

– Nigrosopydon A, 374.

**C<sub>22</sub>H<sub>30</sub>N<sub>2</sub>O<sub>4</sub>S<sub>2</sub>**

– Lissoclibadin 11, 502.

– Lissoclibadin 12, 503.

**C<sub>22</sub>H<sub>30</sub>O<sub>4</sub>**

– Capucinoic acid B, 424.

– Methyl Capucinoate A, 455.

**C<sub>22</sub>H<sub>30</sub>O<sub>5</sub>**

– Sequoiatone B, 508.

– Claviridic acid A, 591.

**C<sub>22</sub>H<sub>30</sub>O<sub>6</sub>**

– Claviridic acid B, 592.

**C<sub>22</sub>H<sub>32</sub>O<sub>3</sub>**

– 22-Deacetoxyanuthone A, 358.

– Penostatin F, 409.

– Penostatin I, 410.

**C<sub>22</sub>H<sub>32</sub>O<sub>4</sub>**– Heterofibrin B<sub>2</sub>, 300.

– Nafuredin, 514.

– Solandelactone G, 579.

**C<sub>22</sub>H<sub>32</sub>O<sub>5</sub>**

– Haliangicin A, 111.

– *cis*-Haliangicin A, 112.

– Haliangicin B, 113.

– Haliangicin C, 114.

– Haliangicin D, 115.

– Macrolactin H, 851.

**C<sub>22</sub>H<sub>32</sub>O<sub>7</sub>**

– Trichodermatide A, 560.

**C<sub>22</sub>H<sub>34</sub>O<sub>4</sub>**

– 2,3-Hydro-7-deacetoxyanuthone A, 366.

– Solandelactone C, 577.

– Solandelactone D, 578.

**C<sub>22</sub>H<sub>34</sub>O<sub>5</sub>**

– Lobophytone T, 353.

**C<sub>22</sub>H<sub>36</sub>O<sub>3</sub>**

– Plakortone A, 518.

**C<sub>22</sub>H<sub>36</sub>O<sub>4</sub>**

– Plakortisinic acid, 491.

**C<sub>22</sub>H<sub>36</sub>O<sub>5</sub>**

– Methyl 3,6-epidioxy-6-methoxy-4,16,18- eicosatrienoate, 456.

**C<sub>22</sub>H<sub>38</sub>**– (3*E*,15*Z*)-3,15-Docosadien-1-yne, 147.**C<sub>22</sub>H<sub>38</sub>O**

– 4,15-Docosadien-1-yn-3-ol, 159.

**C<sub>22</sub>H<sub>38</sub>O<sub>4</sub>**

– 4,6,8,10-Tetraethyl-4,6-dihydroxy-2,7,11-tetradecatrienoic acid, 136.

– (1'*E*,3*S*,4*R*,4'*R*,5'*E*,6*S*)-6-(2,4-Diethyl-1,5-octadienyl)-4,6-diethyl-1,2-dioxane-3-acetic acid, 432.

– 3,6-Epidioxy-4,6,8,10-tetraethyltetradeca-7,11-dienoic acid, 434.

– (4*S*)-Plakortide H, 483.**C<sub>22</sub>H<sub>38</sub>O<sub>5</sub>**

– Attenol B, 511.

- C<sub>22</sub>H<sub>40</sub>O<sub>4</sub>**  
 – 6-(2,4-Diethyl-1-octenyl)-4,6-diethyl-1,2-dioxane-3-acetic acid, 433.  
 – Plakortide S, 487.  
 – Unsaturated fatty acid glycerol ester 4, 649.
- C<sub>22</sub>H<sub>41</sub>NO<sub>3</sub>**  
 – Actisonitrile, 1.
- C<sub>22</sub>H<sub>42</sub>O<sub>4</sub>**  
 – Plakortide U, 489.
- C<sub>22</sub>H<sub>43</sub>NO<sub>3</sub>**  
 – Aplidiasphingosine, 98.  
 – Jaspine A, 808.
- C<sub>23</sub>**
- C<sub>23</sub>H<sub>24</sub>O<sub>2</sub>**  
 – Siphonodiol, 223.
- C<sub>23</sub>H<sub>24</sub>O<sub>3</sub>**  
 – Callytriol A, 149.  
 – Callytriol B, 150.  
 – Callytriol C, 151.  
 – Callytriol D, 152.  
 – Callytriol E, 153.
- C<sub>23</sub>H<sub>24</sub>O<sub>5</sub>**  
 – Penicitrinone A, 555.
- C<sub>23</sub>H<sub>24</sub>O<sub>5</sub>S**  
 – Callyspongine B, 329.
- C<sub>23</sub>H<sub>24</sub>O<sub>8</sub>S<sub>2</sub>**  
 – Callyspongine A, 328.
- C<sub>23</sub>H<sub>26</sub>O<sub>2</sub>**  
 – 14,15-Dihydrosiphonodiol, 158.
- C<sub>23</sub>H<sub>28</sub>O<sub>2</sub>**  
 – 12,13,14,15-Tetrahydrosiphonodiol, 225.
- C<sub>23</sub>H<sub>30</sub>O<sub>6</sub>**  
 – Peyssonenyne A, 321.  
 – Peyssonenyne B, 322.  
 – Sequoiatone A, 545.
- C<sub>23</sub>H<sub>31</sub>ClO<sub>6</sub>**  
 – Punaglandin 7, 629.
- C<sub>23</sub>H<sub>32</sub>O<sub>4</sub>**  
 – Plakinic acid A, 472.
- C<sub>23</sub>H<sub>32</sub>O<sub>5</sub>**  
 – Claviridenone E, 588.  
 – Claviridenone F, 589.  
 – Claviridenone G, 590.
- C<sub>23</sub>H<sub>33</sub>ClO<sub>6</sub>**  
 – (5*Z*)-Punaglandin 8, 630.
- C<sub>23</sub>H<sub>33</sub>Cl<sub>2</sub>NO<sub>4</sub>**  
 – Gymnastatin R, 401.  
 – Dankastatin B, 505.
- C<sub>23</sub>H<sub>33</sub>IO<sub>6</sub>**  
 – (5*Z*)-Iodopunaglandin 8, 608.
- C<sub>23</sub>H<sub>34</sub>CINO<sub>6</sub>**  
 – Gymnastatin G, 400.
- C<sub>23</sub>H<sub>34</sub>O<sub>5</sub>**  
 – Plakortolide F, 534.  
 – Penostatin G, 556.  
 – Penostatin H, 557.
- C<sub>23</sub>H<sub>36</sub>O<sub>4</sub>**  
 – Andavadoic acid, 420.  
 – *epi*-Plakinic acid E methyl ester, 474.
- C<sub>23</sub>H<sub>38</sub>NO<sub>8</sub>P**  
 – Pokepola ester, 688.
- C<sub>23</sub>H<sub>38</sub>O<sub>4</sub>**  
 – Plakinic acid F, 475.  
 – *epi*-Plakinic acid F, 476.
- C<sub>23</sub>H<sub>39</sub>NO<sub>10</sub>**  
 – Mycalamide D, 528.  
 – Mycalamide E, 529.
- C<sub>23</sub>H<sub>40</sub>O<sub>3</sub>**  
 – Hierridin B, 871.
- C<sub>23</sub>H<sub>40</sub>O<sub>4</sub>**  
 – Plakortide P, 484.
- C<sub>23</sub>H<sub>40</sub>O<sub>6</sub>S**  
 – 5-(12-Sulfooxyheptadecyl)-1,3-benzenediol, 875.
- C<sub>23</sub>H<sub>42</sub>O**  
 – (3*R*,4*E*,14*ξ*)-14-Methyl-4-docosen-1-yn-3-ol, 172.  
 – (*R*)-19-Methyl-1-eicosyn-3-ol, 173.  
 – (3*R*,16*ξ*)-16-Methyl-1-eicosyn-3-ol, 174.
- C<sub>23</sub>H<sub>42</sub>O<sub>4</sub>**  
 – Plakortide T, 488.  
 – Plakevulin A, 612.
- C<sub>23</sub>H<sub>44</sub>O<sub>5</sub>**  
 – Glycerol 1-hexadecyl ether diacetate, 721.
- C<sub>23</sub>H<sub>44</sub>O<sub>8</sub>**  
 – Aureobasidin, 2.
- C<sub>23</sub>H<sub>47</sub>NO<sub>2</sub>**  
 – Penazetidine A, 822.
- C<sub>23</sub>H<sub>48</sub>O<sub>3</sub>**  
 – 3-Eicosyloxy-1,2-propanediol, 712.
- C<sub>24</sub>**
- C<sub>24</sub>H<sub>26</sub>O<sub>7</sub>**  
 – Penicitrinol J, 554.
- C<sub>24</sub>H<sub>32</sub>BrNO<sub>3</sub>**  
 – Clathrynamide A, 331.

- C<sub>24</sub>H<sub>32</sub>O<sub>7</sub>**  
 – Claviridic acid C, 593.  
 – Claviridic acid D, 594.  
 – Claviridic acid E, 595.
- C<sub>24</sub>H<sub>34</sub>O<sub>4</sub>**  
 – Plakinic acid B, 473.
- C<sub>24</sub>H<sub>34</sub>O<sub>5</sub>**  
 – Plakortolide F‡, 535.  
 – Macrolactin A, 848.  
 – Macrolactin G, 850.  
 – Macrolactin I, 852.  
 – Macrolactin J, 853.  
 – Macrolactin K, 854.  
 – Macrolactin L, 855.
- C<sub>24</sub>H<sub>34</sub>O<sub>6</sub>**  
 – Heterofibrin A<sub>3</sub>, 298.  
 – Macrolactin V, 857.
- C<sub>24</sub>H<sub>34</sub>O<sub>8</sub>**  
 – Macrolactin F, 849.
- C<sub>24</sub>H<sub>35</sub>Cl<sub>2</sub>NO<sub>5</sub>**  
 – Gymnastatin F, 399.  
 – Dankastatin A, 504.
- C<sub>24</sub>H<sub>36</sub>O<sub>4</sub>**  
 – Plakortolide E, 533.
- C<sub>24</sub>H<sub>36</sub>O<sub>5</sub>**  
 – Peroxyacarnic acid B, 337.  
 – Stolonoxide E, 499.  
 – Stolonoxide F, 500.
- C<sub>24</sub>H<sub>38</sub>O<sub>2</sub>**  
 – (2S\*,4R\*)-2,4-Dimethyl-4-hydroxy-16-phenyl-hexadecanoic acid 1,4-lactone, 867.  
 – (2R\*,4R\*)-2,4-Dimethyl-4-hydroxy-16-phenyl-hexadecanoic acid 1,4-lactone, 868.
- C<sub>24</sub>H<sub>38</sub>O<sub>3</sub>**  
 – 15-HTPE, 70.
- C<sub>24</sub>H<sub>38</sub>O<sub>4</sub>**  
 – Amphidinoketide I, 96.  
 – Amphidinoketide II, 97.
- C<sub>24</sub>H<sub>38</sub>O<sub>5</sub>**  
 – Peroxyacarnic acid A, 336.  
 – Stolonoxide A, 495.  
 – Stolonoxide B, 496.  
 – Stolonoxide C, 497.  
 – Stolonoxide D, 498.
- C<sub>24</sub>H<sub>39</sub>NO<sub>3</sub>**  
 – Mooreamide A, 647.
- C<sub>24</sub>H<sub>40</sub>O<sub>4</sub>**  
 – (-)-Muquublin A, 463.
- C<sub>24</sub>H<sub>40</sub>O<sub>5</sub>**  
 – (-)-9,10-Epoxy muquublin A isomer, 435.  
 – (-)-13,14-Epoxy muquublin A, 436.
- C<sub>24</sub>H<sub>41</sub>NO<sub>4</sub>**  
 – Calicogorgin A, 753.
- C<sub>24</sub>H<sub>41</sub>NO<sub>10</sub>**  
 – Mycalamide A, 526.
- C<sub>24</sub>H<sub>42</sub>O<sub>4</sub>**  
 – Propenediester, 91.
- C<sub>24</sub>H<sub>42</sub>O<sub>6</sub>S**  
 – Callysponginol sulfate A, 330.
- C<sub>24</sub>H<sub>44</sub>O<sub>5</sub>**  
 – Chondrillin, 425.  
 – Plakorin, 479.
- C<sub>24</sub>H<sub>47</sub>O<sub>12</sub>P**  
 – Lysophosphatidyl inositol JMB99-709B, 682.
- C<sub>24</sub>H<sub>48</sub>O<sub>7</sub>**  
 – Sarcoglycoside B, 729.  
 – Sarcoglycoside C, 730.
- C<sub>24</sub>H<sub>50</sub>NO<sub>6</sub>P**  
 – 1-(3Z-Hexadecenyl)glycero-3-phosphocholine, 677.  
 – 1-(4Z-Hexadecenyl)glycero-3-phosphocholine, 678.
- C<sub>24</sub>H<sub>52</sub>NO<sub>6</sub>P**  
 – 1-Hexadecylglycero-3-phosphocholine, 679.
- C<sub>25</sub>**
- C<sub>25</sub>H<sub>32</sub>O<sub>6</sub>**  
 – Insuetolide A, 552.
- C<sub>25</sub>H<sub>33</sub>ClO<sub>8</sub>**  
 – (Z)-Punaglandin 3, 616.  
 – (E)-Punaglandin 3, 617.
- C<sub>25</sub>H<sub>33</sub>ClO<sub>9</sub>**  
 – (E)-Punaglandin 3 epoxide, 620.
- C<sub>25</sub>H<sub>34</sub>O<sub>4</sub>**  
 – Plakortolide, 530.
- C<sub>25</sub>H<sub>34</sub>O<sub>7</sub>**  
 – Clavulone I, 600.  
 – Clavulone II, 601.  
 – Clavulone III, 602.  
 – Clavubicyclone, 642.
- C<sub>25</sub>H<sub>34</sub>O<sub>8</sub>**  
 – Claviridin A, 596.  
 – Claviridin C, 598.

- C<sub>25</sub>H<sub>35</sub>BrO<sub>8</sub>**  
– (*E*)-Punaglandin 4, 621.
- C<sub>25</sub>H<sub>35</sub>ClO<sub>8</sub>**  
– (*Z*)-Punaglandin 4, 622.  
– Punaglandin 5, 626.
- C<sub>25</sub>H<sub>35</sub>ClO<sub>9</sub>**  
– (*E*)-Punaglandin 4 epoxide, 625.
- C<sub>25</sub>H<sub>36</sub>O<sub>5</sub>**  
– Macrolactin M, 856.
- C<sub>25</sub>H<sub>36</sub>O<sub>6</sub>**  
– Heterofibrin B<sub>3</sub>, 301.
- C<sub>25</sub>H<sub>37</sub>ClO<sub>8</sub>**  
– Punaglandin 6, 628.
- C<sub>25</sub>H<sub>38</sub>O<sub>4</sub>**  
– Plakortolide B, 531.
- C<sub>25</sub>H<sub>38</sub>O<sub>6</sub>**  
– Iriomoteolide 3a, 392.
- C<sub>25</sub>H<sub>42</sub>O<sub>4</sub>**  
– Petrosiol A, 209.  
– Sigmosceptrellin B methyl ester, 492.
- C<sub>25</sub>H<sub>42</sub>O<sub>5</sub>**  
– Hurghaperoxide, 441.
- C<sub>25</sub>H<sub>43</sub>NO<sub>4</sub>**  
– Calicogorgin C, 755.
- C<sub>25</sub>H<sub>43</sub>NO<sub>10</sub>**  
– Mycalamide B, 527.
- C<sub>25</sub>H<sub>44</sub>O<sub>3</sub>**  
– Hierridin A, 870.
- C<sub>25</sub>H<sub>44</sub>O<sub>4</sub>**  
– Petrosiol E, 213.
- C<sub>25</sub>H<sub>48</sub>O<sub>9</sub>**  
– Spongilipid, 732.
- C<sub>25</sub>H<sub>49</sub>O<sub>12</sub>P**  
– Lysophosphatidyl inositol JMB99-709A, 681.
- C<sub>26</sub>**
- C<sub>26</sub>H<sub>38</sub>N<sub>2</sub>O<sub>4</sub>S<sub>4</sub>**  
– Lissoclibadin 3, 501.
- C<sub>26</sub>H<sub>40</sub>O<sub>4</sub>**  
– Plakortolide D, 532.
- C<sub>26</sub>H<sub>42</sub>O<sub>5</sub>**  
– Stoloniac acid A, 493.
- C<sub>26</sub>H<sub>44</sub>O<sub>4</sub>**  
– Petrosiol B, 210.  
– Petrosiol D, 212.
- C<sub>26</sub>H<sub>44</sub>O<sub>5</sub>**  
– Stoloniac acid B, 494.
- C<sub>26</sub>H<sub>45</sub>NO<sub>4</sub>**  
– Calicogorgin B, 754.
- C<sub>26</sub>H<sub>48</sub>O<sub>3</sub>**  
– Ficulinic acid A, 108.
- C<sub>26</sub>H<sub>51</sub>O<sub>11</sub>P**  
– 1-[7-(2-Hexyl-3-methylcyclopropyl)heptyl]lysoplasmanylinositol, 680.
- C<sub>26</sub>H<sub>53</sub>O<sub>11</sub>P**  
– 1-(9-Methylhexadecyl)lysoplasmanylinositol, 684.
- C<sub>26</sub>H<sub>54</sub>NO<sub>6</sub>P**  
– 1-*O*-(3'-*Z*-Octadecenyl)glycero-3-phosphocholine, 685.  
– 1-*O*-(4'-*Z*-Octadecenyl)glycero-3-phosphocholine, 686.
- C<sub>27</sub>**
- C<sub>27</sub>H<sub>33</sub>NO<sub>5</sub>**  
– Pyripyropene E, 559.
- C<sub>27</sub>H<sub>35</sub>ClO<sub>9</sub>**  
– (*Z*)-Punaglandin 3 acetate, 618.  
– (*E*)-Punaglandin 3 acetate, 619.
- C<sub>27</sub>H<sub>36</sub>O<sub>6</sub>**  
– Xyloketal A, 561.
- C<sub>27</sub>H<sub>36</sub>O<sub>9</sub>**  
– Claviridin B, 597.  
– Claviridin D, 599.
- C<sub>27</sub>H<sub>37</sub>ClO<sub>10</sub>**  
– Punaglandin 1, 613.
- C<sub>27</sub>H<sub>37</sub>ClO<sub>9</sub>**  
– (*E*)-Punaglandin 4 acetate, 623.  
– (*Z*)-Punaglandin 4 acetate, 624.  
– Punaglandin 5 acetate, 627.
- C<sub>27</sub>H<sub>39</sub>ClO<sub>10</sub>**  
– Punaglandin 2, 614.
- C<sub>27</sub>H<sub>44</sub>O<sub>4</sub>**  
– Plakinic acid G, 477.  
– *epi*-Plakinic acid G, 478.
- C<sub>27</sub>H<sub>48</sub>O<sub>2</sub>**  
– Amphimic acid C, 573.
- C<sub>27</sub>H<sub>54</sub>NO<sub>7</sub>P**  
– 1-*O*-(*cis*-11',12'-Methylene)-octadecanoyl-glycero-3-phosphocholine, 683.
- C<sub>27</sub>H<sub>54</sub>O<sub>7</sub>**  
– Batyl alcohol-3-*O*- $\alpha$ -*L*-fucopyranoside, 704.
- C<sub>28</sub>**
- C<sub>28</sub>H<sub>38</sub>O<sub>8</sub>**  
– Yanuthone D, 388.  
– 7-*O*-Succinoylmacrolactin F, 859.  
– 7-*O*-Succinylmacrolactin A, 860.



- C<sub>28</sub>H<sub>40</sub>O<sub>3</sub>**  
– 2-(4-Hydroxy-3-tetraprenyl)-acetic acid, 872.
- C<sub>28</sub>H<sub>46</sub>O<sub>5</sub>**  
– Archidorin, 655.
- C<sub>28</sub>H<sub>48</sub>O<sub>2</sub>**  
– Amphimic acid B, 572.
- C<sub>28</sub>H<sub>50</sub>O<sub>2</sub>**  
– Amphimic acid A, 571.
- C<sub>28</sub>H<sub>52</sub>O<sub>3</sub>**  
– Ficulinic acid B, 109.
- C<sub>28</sub>H<sub>56</sub>NO<sub>7</sub>P**  
– 1-*O*-(13'*Z*-Eicosaenoyl)-sn-glycero-3-phosphocholine, 671.
- C<sub>29</sub>**
- C<sub>29</sub>H<sub>18</sub>O<sub>6</sub>**  
– Sporothrin A, 412.
- C<sub>29</sub>H<sub>18</sub>O<sub>7</sub>**  
– Sporothrin B, 413.
- C<sub>29</sub>H<sub>39</sub>ClO<sub>11</sub>**  
– Punaglandin 1 acetate, 631.
- C<sub>29</sub>H<sub>39</sub>ClO<sub>11</sub>P<sup>1-</sup>**  
– Franklinolide A, 672.  
– Franklinolide B, 673.  
– Franklinolide C, 674.
- C<sub>29</sub>H<sub>41</sub>ClO<sub>11</sub>**  
– Punaglandin 2 acetate, 615.
- C<sub>29</sub>H<sub>48</sub>O<sub>2</sub>**  
– Miyakosyne A, 175.
- C<sub>29</sub>H<sub>58</sub>O<sub>9</sub>**  
– Mycalol, 15.
- C<sub>30</sub>**
- C<sub>30</sub>H<sub>32</sub>O<sub>4</sub>**  
– Petrosynone, 257.
- C<sub>30</sub>H<sub>34</sub>O<sub>4</sub>**  
– Petroacetylene, 255.
- C<sub>30</sub>H<sub>38</sub>O<sub>4</sub>**  
– Adociacetylene D, 148.  
– Adociacetylene A, 236.
- C<sub>30</sub>H<sub>40</sub>O<sub>2</sub>**  
– Petrosiacetylene A, 204.
- C<sub>30</sub>H<sub>40</sub>O<sub>3</sub>**  
– Petrosiacetylene E, 208.
- C<sub>30</sub>H<sub>40</sub>O<sub>4</sub>**  
– Petrosynol, 214.
- C<sub>30</sub>H<sub>42</sub>BrNO<sub>4</sub>**  
– Clathrynamide C, 333.
- C<sub>30</sub>H<sub>42</sub>O<sub>2</sub>**  
– Petrosiacetylene B, 205.  
– Petrosiacetylene C, 206.
- C<sub>30</sub>H<sub>42</sub>O<sub>4</sub>**  
– 3 $\alpha$ ,28 $\alpha$ -Dihydroxy-1,12,18,29-Triacontatetrayne-14,17-dione, 239.  
– 3 $\beta$ ,28 $\beta$ -Dihydroxy-1,12,18,29-Triacontatetrayne-14,17-dione, 240.
- C<sub>30</sub>H<sub>44</sub>BrNO<sub>4</sub>**  
– Clathrynamide B, 332.
- C<sub>30</sub>H<sub>44</sub>O<sub>2</sub>**  
– Dideoxypetrosynol D, 154.  
– Dideoxypetrosynol F, 155.  
– Petrosiacetylene D, 207.
- C<sub>30</sub>H<sub>46</sub>O<sub>4</sub>**  
– (all-*R*)-1,12,18,29-Triacontatetrayne-3,14,17,28-tetrol, 226.
- C<sub>30</sub>H<sub>48</sub>N<sub>2</sub>O<sub>2</sub>**  
– 2,29-Diamino-4,6,10,13,16,19,22,26-triacontaoctaeene-3,28-diol, 776.
- C<sub>30</sub>H<sub>48</sub>O**  
– 3Z,15Z,27Z-Triacontatriene-1,29-diyne-5S-ol, 227.
- C<sub>30</sub>H<sub>50</sub>O<sub>2</sub>**  
– Miyakosyne B, 176.
- C<sub>30</sub>H<sub>50</sub>O<sub>3</sub>**  
– Elenic acid, 869.
- C<sub>30</sub>H<sub>52</sub>N<sub>2</sub>O<sub>2</sub>**  
– Leucettamol A, 810.
- C<sub>30</sub>H<sub>52</sub>N<sub>2</sub>O<sub>3</sub>**  
– Leucettamol B, 811.
- C<sub>30</sub>H<sub>52</sub>O<sub>12</sub>**  
– Sinularioside, 731.
- C<sub>30</sub>H<sub>56</sub>O**  
– (2*E*,4*E*)-2-Tridecyl-heptadeca-2,4-dienal, 138.
- C<sub>30</sub>H<sub>56</sub>O<sub>10</sub>**  
– Exophilin A, 23.
- C<sub>31</sub>**
- C<sub>31</sub>H<sub>37</sub>NO<sub>10</sub>**  
– Pyripyropene A, 558.
- C<sub>31</sub>H<sub>44</sub>O<sub>3</sub>**  
– Triangulyne C, 230.  
– Corticatic acid A, 289.  
– Corticatic acid B, 290.
- C<sub>31</sub>H<sub>48</sub>O<sub>3</sub>**  
– Petrosynic acid A, 317.

- C<sub>31</sub>H<sub>48</sub>O<sub>4</sub>**  
– Petrosiol C, 211.
- C<sub>31</sub>H<sub>52</sub>O<sub>2</sub>**  
– Miyakosyne C, 177.  
– Miyakosyne E, 179.  
– Miyakosyne F, 180.
- C<sub>31</sub>H<sub>56</sub>O<sub>2</sub>**  
– (all-*Z*)-5,9,23-Triacontatrienoic acid methyl ester, 95.
- C<sub>31</sub>H<sub>58</sub>O<sub>13</sub>**  
– Cervicoside, 4.
- C<sub>31</sub>H<sub>62</sub>O<sub>8</sub>**  
– 4,6,8,10,12,14,16,18-Octamethoxy-1-tricosene, 45.
- C<sub>32</sub>**
- C<sub>32</sub>H<sub>38</sub>O<sub>3</sub>**  
– Callyspongynic acid, 288.
- C<sub>32</sub>H<sub>42</sub>O<sub>3</sub>**  
– Triangulyne E, 232.
- C<sub>32</sub>H<sub>42</sub>O<sub>5</sub>**  
– Adociacetylene C, 260.
- C<sub>32</sub>H<sub>46</sub>O<sub>3</sub>**  
– Triangulyne A, 228.
- C<sub>32</sub>H<sub>50</sub>O<sub>3</sub>**  
– Pellynol B, 190.
- C<sub>32</sub>H<sub>54</sub>O<sub>2</sub>**  
– Miyakosyne D, 178.
- C<sub>33</sub>**
- C<sub>33</sub>H<sub>44</sub>BrNO<sub>6</sub>**  
– Callyspongiolide, 287.
- C<sub>33</sub>H<sub>48</sub>O<sub>3</sub>**  
– Pellynol C, 191.  
– Triangulyne B, 229.  
– Petrosynic acid C, 319.
- C<sub>33</sub>H<sub>50</sub>O<sub>3</sub>**  
– Pellynol F, 193.  
– Petrosynic acid B, 318.
- C<sub>33</sub>H<sub>52</sub>O<sub>3</sub>**  
– Pellynol A, 189.  
– Pellynic acid, 315.  
– Triangulynic acid, 325.
- C<sub>33</sub>H<sub>52</sub>O<sub>4</sub>**  
– Petrosynic acid D, 320.
- C<sub>33</sub>H<sub>54</sub>O<sub>14</sub>**  
– Sarcoglycoside A, 728.
- C<sub>33</sub>H<sub>65</sub>NO<sub>3</sub>**  
– Caulerpicin A, 760.
- C<sub>34</sub>**
- C<sub>34</sub>H<sub>28</sub>O<sub>5</sub>**  
– Ophiodilactone B, 553.
- C<sub>34</sub>H<sub>30</sub>O<sub>5</sub>**  
– Ophiodilactone A, 516.
- C<sub>34</sub>H<sub>46</sub>O<sub>2</sub>**  
– Triangulyne G, 234.
- C<sub>34</sub>H<sub>46</sub>O<sub>3</sub>**  
– Triangulyne F, 233.
- C<sub>34</sub>H<sub>48</sub>O<sub>13</sub>**  
– Macrolactin W, 858.
- C<sub>34</sub>H<sub>49</sub>ClO<sub>10</sub>**  
– Latrunculinoside B, 637.
- C<sub>34</sub>H<sub>63</sub>NO<sub>5</sub>**  
– *N*-[15-Methyl-3-(13-methyl-4-tetradecenoyloxy)hexadecanoyl]glycine, 123.
- C<sub>34</sub>H<sub>64</sub>O<sub>6</sub>**  
– Tanikolide dimer, 27.
- C<sub>34</sub>H<sub>65</sub>NO<sub>3</sub>**  
– Ceramide 1, 767.  
– (2*S*,3*R*)-1,3-Dihydroxy-2-octadecanoyl-amino-4*E*,8*E*-hexadecadiene, 778.
- C<sub>34</sub>H<sub>65</sub>NO<sub>5</sub>**  
– Topostin B 567, 137.
- C<sub>34</sub>H<sub>65</sub>NO<sub>7</sub>S**  
– *N*-(2*R*-Hydroxyhexadecanoyl)-2-amino-4,8-octadecadiene-1,3-diol 1-*O*-sulfate, 801.
- C<sub>34</sub>H<sub>65</sub>NO<sub>10</sub>S**  
– Carteriosulfonic acid C, 65.
- C<sub>34</sub>H<sub>67</sub>NO<sub>7</sub>S**  
– Calyceramide A, 756.  
– Calyceramide B, 757.  
– Calyceramide C, 758.
- C<sub>34</sub>H<sub>68</sub>N<sub>2</sub>O<sub>8</sub>**  
– Rhizochalin, 826.
- C<sub>34</sub>H<sub>68</sub>N<sub>2</sub>O<sub>9</sub>**  
– Calyxoside, 759.  
– Oceanapiside, 814.
- C<sub>34</sub>H<sub>68</sub>O<sub>9</sub>**  
– 4,6,8,10,12,14,16,18,20-Nonamethoxy-1-pentacosene, 44.

**C<sub>34</sub>H<sub>69</sub>NO<sub>5</sub>**

- (*all-ξ*)-*N*-Hexadecanoyl-2-imino-1,3,4,5-octa- decanetetrol, 798.

**C<sub>35</sub>****C<sub>35</sub>H<sub>52</sub>O<sub>3</sub>**

- Pellynol D, 192.

**C<sub>35</sub>H<sub>67</sub>NO<sub>13</sub>**

- Myrmekioside E, 727.

**C<sub>35</sub>H<sub>69</sub>NO<sub>3</sub>**

- Caulerpicin B, 761.
- *N*-Hexadecanoyl-(2*S*,3*R*,4*E*)-2-amino-4-nonadecene-1,3-diol, 797.

**C<sub>36</sub>****C<sub>36</sub>H<sub>67</sub>NO<sub>11</sub>S**

- Carteriosulfonic acid A, 63.

**C<sub>36</sub>H<sub>68</sub>O<sub>17</sub>**

- Myrmekioside A, 725.

**C<sub>36</sub>H<sub>69</sub>N<sub>2</sub>O<sub>15</sub>PS**

- Siladenoserinol J, 698.

**C<sub>36</sub>H<sub>71</sub>NO<sub>4</sub>**

- Symbioramide, 829.

**C<sub>36</sub>H<sub>71</sub>NO<sub>5</sub>**

- (2*S*,3*S*,4*R*)-1,3,4-Trihydroxy-2-(2-(*R*)-hydroxyoctadecanoyl-amino)octadec-8*E*-ene, 835.

**C<sub>37</sub>****C<sub>37</sub>H<sub>56</sub>O<sub>3</sub>**

- Triangulyne H, 235.

**C<sub>37</sub>H<sub>59</sub>N<sub>2</sub>O<sub>10</sub>P**

- Hemicalyculin, 676.

**C<sub>37</sub>H<sub>66</sub>O<sub>4</sub>**

- Unsaturated fatty acid glycerol ester 5, 650.
- Unsaturated fatty acid glycerol ester 8, 653.

**C<sub>37</sub>H<sub>68</sub>O<sub>4</sub>**

- Unsaturated fatty acid glycerol ester 7, 652.

**C<sub>37</sub>H<sub>69</sub>NO<sub>4</sub>**

- Asperamide A, 747.

**C<sub>37</sub>H<sub>69</sub>NO<sub>7</sub>S**

- *N*-(2*R*-Hydroxyoctadecanoyl)-2-amino-9-methyl-4,8,10-octadecatriene-1,3-diol-1-*O*-sulfate, 804.

**C<sub>37</sub>H<sub>70</sub>O**

- (3*Z*,5*ξ*)-3-Heptatriaconten-1-yn-5-ol, 163.

**C<sub>37</sub>H<sub>70</sub>O<sub>4</sub>**

- Unsaturated fatty acid glycerol ester 9, 654.

**C<sub>37</sub>H<sub>70</sub>O<sub>17</sub>**

- Myrmekioside B, 726.

**C<sub>37</sub>H<sub>74</sub>O<sub>10</sub>**

- 4,6,8,10,12,14,16,18,20,22-Decamethoxy-1-heptacosene, 35.

**C<sub>37</sub>H<sub>75</sub>NO<sub>5</sub>**

- (2*S*,3*S*,4*R*)-1,3,4-Trihydroxy-2-[(*R*-2'-hydroxytetradecanoyl)amino]tricosane, 836.

**C<sub>38</sub>****C<sub>38</sub>H<sub>46</sub>O<sub>12</sub>S**

- Abyssomicin J, 549.

**C<sub>38</sub>H<sub>69</sub>NO<sub>12</sub>S**

- Carteriosulfonic acid B, 64.

**C<sub>38</sub>H<sub>71</sub>N<sub>2</sub>O<sub>16</sub>PS**

- Siladenoserinol C, 691.

**C<sub>38</sub>H<sub>72</sub>O**

- (3*R*,4*E*)-4-Octatriaconten-1-yn-3-ol, 188.

**C<sub>38</sub>H<sub>77</sub>NO<sub>5</sub>**

- *N*-(2*R*-Hydroxydocosanoyl)-2-amino-14-methyl-1,3,4-pentadecanetriol, 800.
- *N*-(2*R*-Hydroxy-21-methyldocosanoyl)-2-amino-1,3,4-pentadecanetriol, 802.

**C<sub>39</sub>****C<sub>39</sub>H<sub>57</sub>ClO<sub>13</sub>**

- Latrunculinoside A, 636.

**C<sub>39</sub>H<sub>63</sub>N<sub>2</sub>O<sub>12</sub>P**

- Geometricin A, 675.

**C<sub>39</sub>H<sub>75</sub>N<sub>2</sub>O<sub>15</sub>PS**

- Siladenoserinol K, 699.
- Siladenoserinol L, 700.

**C<sub>40</sub>****C<sub>40</sub>H<sub>58</sub>O<sub>7</sub>**

- Aplydilactone, 641.

**C<sub>40</sub>H<sub>65</sub>N<sub>2</sub>O<sub>12</sub>P**

- Swinhoeiamide A, 701.

**C<sub>40</sub>H<sub>71</sub>NO<sub>9</sub>S**

- Taurospongina A, 323.

**C<sub>40</sub>H<sub>72</sub>O<sub>14</sub>**

- Roselipin 1A, 131.
- Roselipin 1B, 132.

**C<sub>40</sub>H<sub>73</sub>N<sub>2</sub>O<sub>17</sub>PS**

- Siladenoserinol B, 690.

- C<sub>40</sub>H<sub>79</sub>NO<sub>3</sub>**  
 – *N*-Docosanoyl-*D*-erythro-(2*S*,3*R*)-16-methylheptadecasping-4(*E*)-enine, 779.
- C<sub>41</sub>**  
**C<sub>41</sub>H<sub>52</sub>O<sub>10</sub>**  
 – Xyloketal F, 562.  
**C<sub>41</sub>H<sub>62</sub>O<sub>7</sub>**  
 – Lobophytone S, 407.  
**C<sub>41</sub>H<sub>63</sub>ClO<sub>8</sub>**  
 – Lobophytone Q, 405.  
**C<sub>41</sub>H<sub>64</sub>O<sub>3</sub>**  
 – Triangulyne D, 231.  
**C<sub>41</sub>H<sub>64</sub>O<sub>8</sub>**  
 – Lobophytone R, 406.  
**C<sub>41</sub>H<sub>64</sub>O<sub>9</sub>**  
 – Lobophytone A, 402.  
 – Lobophytone O, 403.  
**C<sub>41</sub>H<sub>72</sub>N<sub>2</sub>O<sub>9</sub>**  
 – Oceanalin A, 813.  
**C<sub>41</sub>H<sub>75</sub>NO<sub>9</sub>**  
 – Cerebroside A, 768.  
 – Chrysoreside B, 775.  
**C<sub>41</sub>H<sub>77</sub>NO<sub>9</sub>**  
 – Cerebroside B, 769.  
**C<sub>41</sub>H<sub>77</sub>N<sub>2</sub>O<sub>16</sub>PS**  
 – Siladenoserinol D, 692.  
 – Siladenoserinol E, 693.  
 – Siladenoserinol F, 694.  
 – Siladenoserinol H, 696.  
 – Siladenoserinol I, 697.  
**C<sub>41</sub>H<sub>79</sub>NO<sub>9</sub>**  
 – Ishigoside, 723.  
**C<sub>41</sub>H<sub>81</sub>NO<sub>3</sub>**  
 – Caulerpicin C, 762.  
 – *N*-(2-Hydroxydocosanoyl)-2-amino-9-methyl-4-octadecene-1,3-diol, 799.
- C<sub>42</sub>**  
**C<sub>42</sub>H<sub>74</sub>O<sub>15</sub>**  
 – Roselipin 2A, 133.  
 – Roselipin 2B, 134.  
**C<sub>42</sub>H<sub>76</sub>O<sub>14</sub>**  
 – Halymecin A, 24.  
**C<sub>42</sub>H<sub>77</sub>NO<sub>7</sub>**  
 – Bathymodiolamide B, 752.  
**C<sub>42</sub>H<sub>77</sub>NO<sub>9</sub>**  
 – Alternaroside B, 742.  
 – Alternaroside C, 743.
- C<sub>42</sub>H<sub>79</sub>NO<sub>4</sub>**  
 – *N*-(2*ξ*-Hydroxytricosanoyl)-2-amino-9-methyl-4,8,10-octadecatriene-1,3-diol, 805.  
**C<sub>42</sub>H<sub>83</sub>NO<sub>3</sub>**  
 – *N*-(Tricosanoyl)-2-amino-9-methyl-4-octadecene-1,3-diol, 834.  
**C<sub>42</sub>H<sub>83</sub>NO<sub>4</sub>**  
 – *N*-(2-Hydroxytricosanoyl)-2-amino-9-methyl-4-octadecene-1,3-diol, 806.  
**C<sub>42</sub>H<sub>85</sub>NO<sub>5</sub>**  
 – *N*-(2*R*-Hydroxy-23-methyltetracosanoyl)-(2*S*,3*S*,4*R*)-2-amino-1,3,4-heptadecanetriol, 803.
- C<sub>43</sub>**  
**C<sub>43</sub>H<sub>66</sub>O<sub>10</sub>**  
 – Capsosulvesin A, 61.  
 – Lobophytone P, 404.  
**C<sub>43</sub>H<sub>70</sub>O<sub>10</sub>**  
 – Capsosulvesin B, 62.  
 – Glycerol-1-(7*Z*,10*Z*,13*Z*-hexadecatrienoate), 2-(9*Z*,12*Z*,15*Z*-octadecatrienoate)-(2*R*)-3-*O*- $\beta$ -*D*-Galactopyranoside, 720.  
**C<sub>43</sub>H<sub>77</sub>NO<sub>9</sub>**  
 – Sarcoehrenoside A, 827.  
**C<sub>43</sub>H<sub>77</sub>NO<sub>10</sub>**  
 – Alternaroside A, 741.  
**C<sub>43</sub>H<sub>79</sub>NO<sub>9</sub>**  
 – Avuside B, 750.  
 – Cerebroside C, 770.  
 – Flavicerebroside B, 781.  
 – Flavuside B, 783.  
**C<sub>43</sub>H<sub>79</sub>N<sub>2</sub>O<sub>17</sub>PS**  
 – Siladenoserinol A, 689.  
 – Siladenoserinol G, 695.  
**C<sub>43</sub>H<sub>81</sub>NO<sub>9</sub>**  
 – Avuside A, 749.  
 – Cerebroside D, 773.  
 – Flavicerebroside A, 780.  
 – Flavuside A, 782.  
**C<sub>43</sub>H<sub>83</sub>NO<sub>10</sub>**  
 – Astrocerebroside A, 748.  
**C<sub>43</sub>H<sub>85</sub>NO<sub>3</sub>**  
 – *N*-(Tetracosanoyl)-2-amino-9-methyl-4-octadecene-1,3-diol, 832.
- C<sub>44</sub>**  
**C<sub>44</sub>H<sub>64</sub>O<sub>11</sub>**  
 – Petrosolic acid, 316.

- C<sub>44</sub>H<sub>81</sub>NO<sub>9</sub>**  
 – (2*S*,3*S*,4*R*)-1,3,4-Triacetoxy-2-[(*R*-2'-acetoxyocatadecanoyl)amino]octadecane, 833.
- C<sub>44</sub>H<sub>87</sub>NO<sub>3</sub>**  
 – *N*-(Pentacosanoyl)-2-amino-9-methyl-4-octadecene-1,3-diol, 823.
- C<sub>45</sub>**  
**C<sub>45</sub>H<sub>66</sub>O<sub>3</sub>**  
 – Neopetroformyne B, 184.
- C<sub>45</sub>H<sub>66</sub>O<sub>4</sub>**  
 – Neopetroformyne D, 186.
- C<sub>45</sub>H<sub>68</sub>O<sub>3</sub>**  
 – Neopetroformyne C, 185.
- C<sub>45</sub>H<sub>76</sub>O<sub>12</sub>S**  
 – (6-Sulfoquinovopyranosyl)-(1→3)-1'-(5,8,11,14,17-eicosapentaenoyl)-2'-hexadecanoyl- glycerol, 733.
- C<sub>45</sub>H<sub>80</sub>O<sub>16</sub>**  
 – Cladionol A, 103.
- C<sub>45</sub>H<sub>83</sub>NO<sub>9</sub>**  
 – Ophidiacerebroside A, 815.
- C<sub>45</sub>H<sub>87</sub>NO<sub>8</sub>**  
 – Cerebroside PA-0-5, 774.
- C<sub>46</sub>**  
**C<sub>46</sub>H<sub>62</sub>O<sub>3</sub>**  
 – 3,4,4-Dioxopetroformyne 2, 242.
- C<sub>46</sub>H<sub>64</sub>O<sub>3</sub>**  
 – 3,4,4-Dioxopetroformyne 1, 241.
- C<sub>46</sub>H<sub>66</sub>O<sub>2</sub>**  
 – Isopetroformyne 7, 244.
- C<sub>46</sub>H<sub>66</sub>O<sub>3</sub>**  
 – Petroformyne 10, 256.
- C<sub>46</sub>H<sub>68</sub>O<sub>2</sub>**  
 – Isopetroformyne 4, 171.  
 – Nor-(3*S*,14*S*)-petrocortyne A, 187.  
 – Petrotetraandiol A, 215.  
 – 23,24-Dihydropetroformyne 7, 238.  
 – Isopetroformyne 6, 243.  
 – 20-Oxopetroformyne 3, 254.  
 – Petrotetraandiol A, 259.
- C<sub>46</sub>H<sub>68</sub>O<sub>3</sub>**  
 – Neopetroformyne A, 183.  
 – Petrotetraandiol C, 217.
- C<sub>46</sub>H<sub>70</sub>O<sub>2</sub>**  
 – Isopetroformyne 3, 170.  
 – (3*S*,14*S*)-Petrocortyne A, 194.  
 – Petrocortyne A, 195.  
 – Petrotetraandiol E, 218.  
 – 23,24-Dihydropetroformyne 6, 237.
- C<sub>46</sub>H<sub>70</sub>O<sub>3</sub>**  
 (3*S*,14*R*)-Petrocortyne E, 197.  
 – Petrocortyne F, 198.  
 – Petrocortyne G, 199.  
 – Petrocortyne H, 200.  
 – Petrotetraandiol A, 220.  
 – Petrotetraandiol D, 258.  
 – Petrocortyne C, 338.
- C<sub>46</sub>H<sub>72</sub>O<sub>2</sub>**  
 – 4,5-Dihydroisopetroformyne 3, 157.  
 – (3*S*,14*S*)-Petrocortyne B, 196.  
 – Petrotetraandiol B, 216.  
 – Petrotriandiol A, 221.
- C<sub>46</sub>H<sub>76</sub>O<sub>2</sub>**  
 – Fulvinol, 162.
- C<sub>46</sub>H<sub>78</sub>O<sub>7</sub>**  
 – Manzamenone A, 643.
- C<sub>46</sub>H<sub>85</sub>NO<sub>9</sub>**  
 – Ophidiacerebroside B, 816.
- C<sub>46</sub>H<sub>87</sub>NO<sub>9</sub>**  
 – Sarcocochrenolide B, 828.
- C<sub>46</sub>H<sub>90</sub>N<sub>2</sub>O<sub>10</sub>**  
 – Halicylindroside B<sub>1</sub>, 791.
- C<sub>46</sub>H<sub>91</sub>NO<sub>3</sub>**  
 – (2*S*,3*R*)-1,3-Dihydroxy-2-docosanoyl-amino-4*E*-hexacocaene, 777.
- C<sub>46</sub>H<sub>91</sub>NO<sub>10</sub>**  
 – Acanthacerebroside A, 734.  
 – Agelasphin 7A, 738.
- C<sub>47</sub>**  
**C<sub>47</sub>H<sub>72</sub>O<sub>2</sub>**  
 – Homo-(3*S*,14*S*)-petrocortyne A, 165.
- C<sub>47</sub>H<sub>72</sub>O<sub>10</sub>**  
 – Osirisyne B, 310.  
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- C<sub>57</sub>H<sub>105</sub>NO<sub>9</sub>**  
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– CEG 4, 764.

**C<sub>59</sub>****C<sub>59</sub>H<sub>107</sub>NO<sub>9</sub>**

– Plakoside B, 825.

**C<sub>59</sub>H<sub>113</sub>NO<sub>23</sub>S**– *Luidia maculata* Ganglioside  
1, 812.**C<sub>60</sub>****C<sub>60</sub>H<sub>101</sub>N<sub>4</sub>O<sub>20</sub>P**

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**C<sub>60</sub>H<sub>115</sub>NO<sub>20</sub>**

– Agelagalastatin, 735.

**C<sub>62</sub>****C<sub>62</sub>H<sub>108</sub>N<sub>2</sub>O<sub>24</sub>**

– Erylusamine B, 713.

**C<sub>62</sub>H<sub>109</sub>NO<sub>10</sub>S**

– Syriacin, 830.

**C<sub>62</sub>H<sub>116</sub>N<sub>2</sub>O<sub>23</sub>**

– CEG 5, 765.

**C<sub>64</sub>****C<sub>64</sub>H<sub>110</sub>N<sub>2</sub>O<sub>25</sub>**

– Erylusamine C, 714.

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**C<sub>64</sub>H<sub>116</sub>N<sub>2</sub>O<sub>23</sub>**

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**C<sub>65</sub>****C<sub>65</sub>H<sub>112</sub>N<sub>2</sub>O<sub>25</sub>**

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**C<sub>66</sub>****C<sub>66</sub>H<sub>116</sub>O<sub>9</sub>**

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– CEG 6, 766.

**C<sub>74</sub>****C<sub>74</sub>H<sub>135</sub>N<sub>3</sub>O<sub>31</sub>**

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## Index 3 Compound Organism Source Index

This index lists in alphabetical order all 433 marine organism in Latin names in **HAMNP Volume 6**, following a code sequence of related active compounds. When one hopes to know the English type name of any marine organism, please see an entry of a related compound in the code sequence. For example, if one hopes to know the English common type name of “*Haliclona* sp.”, from entry 39 of this index, one will know that the *Haliclona* sp. is a sponge.

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- 1 CHINA
- 2 JAPAN
- 3 KOREA WATERS
- 4 R. O. KOREA
- 5 ASIA
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For all 137 compound sampling geographic locations, each of them has put into one large area, and then within the area, all related geographic places are listed in alphabetical order with the detail information in the texts of the “Handbook of Active Marine Natural Products Volume 6” and a number code sequence of the related compounds follows the detail information immediately. There are 604 related compounds with geographic information in HAMNP Volume 6.

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## Index 5 Compound Pharmacological Activity Index

In this index, a set of very formatted pharmacological activity codes have been used, specially for all types of cancer cells, please see “**List of Cancer Cells Codes**”. A special note is that the word “Cytotoxic” means *in vitro* anticancer activities, while the word “Antineoplastic” means *in vivo* anti-cancer activities.

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