

# Natural Products: Microbial Metabolites



Natural products biosynthesized by bacteria and fungi exhibit a broad spectrum of chemical and functional diversity. Biologically active microbial metabolites have a variety of cellular targets, making them useful as lead compounds in drug discovery and as chemical probes to explore biological processes in a multitude of research areas, including microbiology, cell biology, cancer, and lipid biochemistry.

## Antimicrobials

Item No.	Product Name	Summary
15305	A-54556A	An acyldepsipeptide antibiotic that constitutively activates bacterial Clp protease
27478	Aranorosin	Has antibacterial and antifungal activity and reduces viability in apoptosis-resistant HeLa/Bcl-2 cells
20136	Cinnamycin	A lantibiotic with antiviral activity against herpes simplex virus 1 (HSV-1) KOS strain infection in Vero cells
15385	Indolmycin	Inhibits prokaryotic tryptophanyl-tRNA synthetase ( $IC_{50}$ = 30 $\mu$ M)
15505	Lasalocid	An ionophore antibiotic used in veterinary practice as a coccidiostat for gastrointestinal parasites
15506	Moenomycin Complex	A mixture of moenomycins A, A <sub>12</sub> , C <sub>1</sub> , C <sub>3</sub> , and C <sub>4</sub> , which directly inhibit bacterial peptidoglycan glycosyltransferases
11634	Natamycin	Blocks fungal growth by binding specifically to ergosterol with an apparent affinity of ~100 $\mu$ M
18457	Novobiocin (sodium salt)	A coumarin antibiotic that has antibacterial activity and inhibits the ATPase activity of DNA gyrase
14157	Polymyxin B (sulfate)	A mixture of peptides that is active against major multidrug-resistant Gram-negative bacteria <i>in vitro</i>
15377	Venturicidin A	Inhibits bacterial and mitochondrial ATP synthases; also active against the plant pathogenic fungus <i>Venturia</i> and cytotoxic to trypanosomes ( $IC_{50}$ = 120-540 ng/ml)

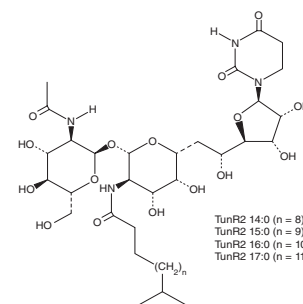
See all microbial metabolites with antimicrobial activity at [www.caymanchem.com](http://www.caymanchem.com)

## Derivatives of Natural Products Further Drug Discovery

### TunR2 - Item No. 31538

TunR2 is a derivative of the microbial metabolite tunicamycin that is active against and increases the efficacy of several  $\beta$ -lactam antibiotics against *B. subtilis*. TunR2 has reduced eukaryotic toxicity compared with tunicamycin and does not inhibit glycosylation in a protein N-glycosylation assay.

See all tunicamycin derivatives and mixtures at [www.caymanchem.com](http://www.caymanchem.com)



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# Cell Biology

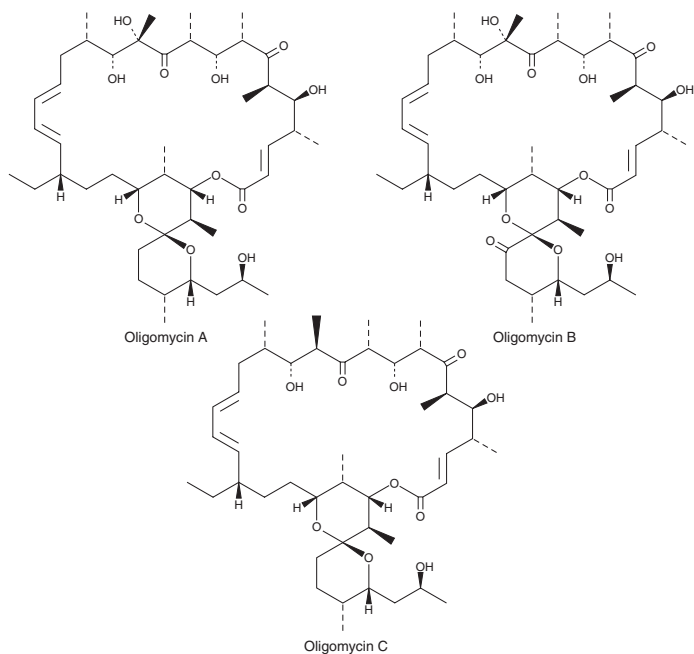
## Mitochondrial Function Disruptors

Item No.	Product Name
19433	Antimycin A <sub>1</sub>
11898	Atpenin A5
15379	Piericidin A

### FEATURED PRODUCT

#### Oligomycin Complex - Item No. 11341

Oligomycins are macrolides that have been found in *Streptomyces* species and can be toxic to other organisms. Oligomycin Complex is a mixture of oligomycins A, B, and C, which inhibit the mitochondrial F<sub>1</sub>F<sub>0</sub> ATP synthase.



See all oligomycins at [www.caymanchem.com](http://www.caymanchem.com)

## V-ATPase Inhibitors

Item No.	Product Name
11038	Bafilomycin A <sub>1</sub>
14005	Bafilomycin B <sub>1</sub>
11050	Concanamycin A

## Protein Synthesis Inhibitors

Item No.	Product Name
14126	Cycloheximide
13884	Puromycin (hydrochloride)

## Protease & Peptidase Inhibitors

Item No.	Product Name
70520	Bestatin (hydrochloride)
10007963	E-64
9000469	Pepstatin A

## Proteasome Inhibitors

Item No.	Product Name
70988	Clasto-Lactacystin β-lactone
10007806	Epoxomicin
70980	Lactacystin

## Nucleic Acid Synthesis, Turnover, & Signaling Inhibitors

Item No.	Product Name
17898	α-Amanitin
18142	β-Amanitin
14007	(+)-Aphidicolin

## Epigenetics Research Tools

Item No.	Product Name
10575	Apicidin
13829	Sinefungin

## Need Help with Microbial Metabolite Production and Isolation?

Cayman's Natural Products Chemistry division specializes in the extraction of relevant compounds from biological sources and the preparation of natural products through biocatalytic, semi-, or total chemical synthesis.



Learn more about our services at [www.caymanchem.com/orgsynthesis](http://www.caymanchem.com/orgsynthesis)

Meet our natural products chemistry experts at [www.caymanchem.com/natural-experts](http://www.caymanchem.com/natural-experts)

# Cell Biology (cont.)

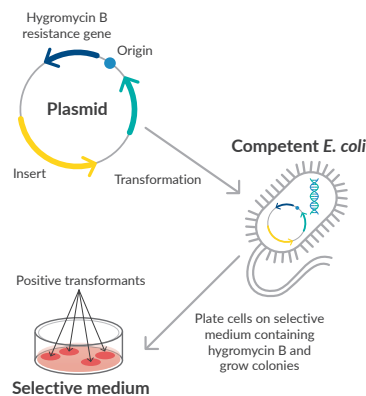
## Ionophores

Item No.	Product Name	Summary
11016	A23187	A calcium ionophore that induces calcium overload and mitochondrial apoptosis in HEK293 cells
11932	Ionomycin (calcium salt)	A selective calcium ionophore that mobilizes intracellular calcium stores
11437	Nigericin (sodium salt)	Acts as a potassium ionophore, promoting K <sup>+</sup> /H <sup>+</sup> exchange across mitochondrial membranes

## Selective Agents

Several natural antibiotics are commonly used as selective agents to isolate transformants expressing specific resistance genes.

Item No.	Product Name
14499	Blasticidin S (hydrochloride)
14291	Hygromycin B (hydrate)
15321	Kanamycin A (sulfate)



## Additional Cell Biology Research Tools

Item No.	Product Name	Summary
11425	Alamethicin	A peptaibol that forms voltage-gated ion channels in cell membranes
11861	Brefeldin A	A reversible inhibitor of vesicular transport used to study endosomal trafficking and function
14595	Deferoxamine (mesylate)	An iron chelator and inhibitor of iron-dependent prolyl hydroxylases ( $EC_{50} = 17.8 \mu\text{M}$ )
14079	Heptelidic Acid	A selective, irreversible GAPDH inhibitor that binds to the active site with a $K_i$ value of $1.6 \mu\text{M}$
10009437	Kifunensine	A potent and selective inhibitor of class I $\alpha$ -mannosidases
10011011	KT 5720	An inhibitor of PKA ( $K_i = 60 \text{ nM}$ ) that also inhibits phosphorylase kinase, PDK1, MEK, MSK1, PKB $\alpha$ , and GSK3 $\beta$
10004976	Leptomycin B	Blocks the interaction of CRM1 (exportin 1) with nuclear export signals, inhibiting nuclear protein export
11345	Paxilline	Inhibits large conductance Ca <sup>2+</sup> -activated K <sup>+</sup> (BKCa) channels in patch clamp and whole smooth muscle cell studies ( $K_{1/2} = 1.9$ and $35.7 \text{ nM}$ , respectively)
13346	Rapamycin	An allosteric inhibitor of mammalian target of rapamycin (mTOR) complex 1 (mTORC1)
29735	YM-254890	An inhibitor of platelet aggregation and G $\alpha_{q11}$ -mediated intracellular calcium mobilization

## Cancer

Item No.	Product Name	Summary
20133	Asukamycin	Inhibits the growth of various tumor cell lines ( $IC_{50} = 1-5 \mu\text{M}$ ) by activating caspase-8 and caspase-3
14834	Azaserine	A tumor-inhibiting antibiotic that functions as a glutamine analog
13877	Bleomycin (sulfate)	An antitumor antibiotic that interrupts the cell cycle by causing single- and double-strand DNA breaks in tumor cells
14437	Chetomin	Inhibits hypoxia-inducible factor (HIF) signaling, cell growth, and tumor growth in cancer cells and xenografts
11330	Cytochalasin D	Inhibits actin polymerization at concentrations as low as $0.2 \mu\text{M}$ , preventing tumor cell migration
15387	Galiellactone	Inhibits IL-6-mediated JAK/STAT signal transduction in HepG2 cells ( $IC_{50} = 0.25-0.5 \mu\text{M}$ )
11434	Mithramycin A	A DNA-binding antitumor antibiotic
11435	Mitomycin C	An antitumor antibiotic and DNA crosslinker

See all microbial metabolites for use in cancer research at [www.caymanchem.com](http://www.caymanchem.com)

# Lipid Biochemistry & Metabolism

Item No.	Product Name	Summary
10005647	Cerulenin	An irreversible inhibitor of fatty acid synthase
19850	Ergosterol	A fungal sterol that is converted to vitamin D <sub>2</sub> by ultraviolet light
70440	Filipin III	A polyene macrolide that binds to cholesterol and has been used to detect it in membrane fractions
63150	Myriocin	An inhibitor of serine palmitoyltransferase ( $K_i = 0.28$ nM) and a potent immunosuppressant
11896	Pyripyropene A	Inhibits acyl-CoA:cholesterol acyltransferase-2 (ACAT-2; $IC_{50} = 70$ nM) <i>in vitro</i> and cholesterol absorption in mouse intestine
89460	Sclerotiorin	Inhibits soybean lipoxygenase-1 (LO-1) and cholesterol ester transfer protein (CETP; $IC_{50}$ s = 4.2 and 19.4 $\mu$ M, respectively)
10007448	Triacsin C	Inhibitor of long fatty acid acyl-CoA synthetase ( $IC_{50} = 6.3$ $\mu$ M in Raji cells)
17452	Zaragozic Acid A	Inhibits squalene synthase <i>in vitro</i> ( $K_i = 78$ pM) and hepatic cholesterol synthesis in mice ( $ED_{50} = 0.2$ mg/kg)

See all microbial metabolites for use in lipid biochemistry and metabolism research at [www.caymanchem.com](http://www.caymanchem.com)

## Toxins

### Mycotoxins

Item No.	Product Name
11293	Aflatoxin B <sub>1</sub>
11295	Aflatoxin G <sub>1</sub>
11296	Aflatoxin G <sub>2</sub>
11297	Aflatoxin M <sub>1</sub>
11328	Cytochalasin B
62580	Fumonisin B <sub>1</sub>
13227	Fumonisin B <sub>2</sub>
20434	Fumonisin B <sub>3</sub>
11439	Ochratoxin A
16167	Ochratoxin B
20183	Ochratoxin C
9003415	Satratoxin G
30199	Satratoxin H

See all mycotoxins at [www.caymanchem.com](http://www.caymanchem.com)

### Microcystins & Other Cyanotoxins

Item No.	Product Name
10007867	Cylindrospermopsin
10007187	Microcystin-LA
10007188	Microcystin-LR
10007868	Microcystin-RR
10007190	Nodularin

Explore more than 650 microbial metabolites at [www.caymanchem.com](http://www.caymanchem.com)

## Tools for Toxin Quantification

### Mycotoxin Mixture 5 (CRM)

Item No. 28151

- Contains aflatoxin B<sub>1</sub>, B<sub>2</sub>, G<sub>1</sub>, G<sub>2</sub>, and ochratoxin A at 10  $\mu$ g/ml of each compound
- Intended for use as a calibration or secondary quality control standard
- Manufactured and tested to meet ISO 17034 and ISO/IEC 17025 international standards

### Microcystin ELISA Kit

Item No. 502000

- Detect microcystins in various natural water samples
- Measure microcystin levels in natural water samples down to 27.4 pg/ml
- Assay up to 24 samples in triplicate and 36 samples in duplicate per plate

