

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 ($IC_{50} = 30 \mu\text{M}$) |
| 15505 | Lasalocid | An ionophore antibiotic used in veterinary practice as a coccidiostat for gastrointestinal parasites |
| 15506 | Moenomycin Complex | A mixture of moenomycins A, A ₁₂ , C ₁ , C ₃ , and C ₄ , which directly inhibit bacterial peptidoglycan glycosyltransferases |
| 11634 | Natamycin | Blocks fungal growth by binding specifically to ergosterol with an apparent affinity of $\sim 100 \mu\text{M}$ |
| 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 ($IC_{50} = 120\text{-}540 \text{ ng/ml}$) |

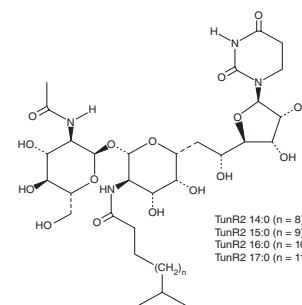
See all microbial metabolites with antimicrobial activity at www.caymanchem.com

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 β -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



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Cell Biology

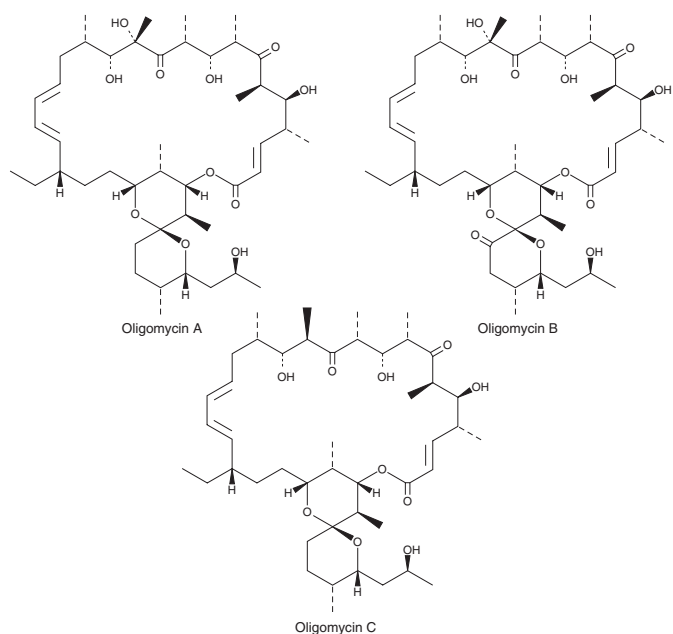
Mitochondrial Function Disruptors

| Item No. | Product Name |
|----------|--------------------------|
| 19433 | Antimycin A ₁ |
| 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 F₁F₀ ATP synthase.



See all oligomycins at www.caymanchem.com

V-ATPase Inhibitors

| Item No. | Product Name |
|----------|----------------------------|
| 11038 | Bafilomycin A ₁ |
| 14005 | Bafilomycin B ₁ |
| 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.



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Meet our natural products chemistry experts at www.caymanchem.com/natural-experts

Cell Biology (cont.)

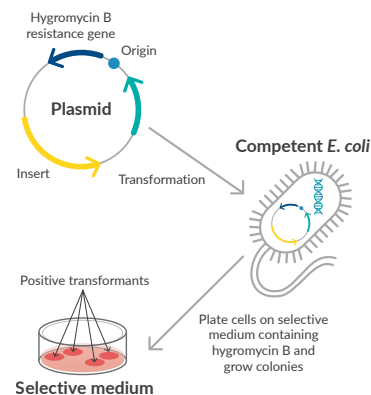
Ionophores

| 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^+/H^+ 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 ($EC_{50} = 17.8 \mu M$) |
| 14079 | Heptelidic Acid | A selective, irreversible GAPDH inhibitor that binds to the active site with a K_i value of $1.6 \mu M$ |
| 10009437 | Kifunensine | A potent and selective inhibitor of class I α -mannosidases |
| 10011011 | KT 5720 | An inhibitor of PKA ($K_i = 60 nM$) that also inhibits phosphorylase kinase, PDK1, MEK, MSK1, PKBa, and GSK3 β |
| 10004976 | Leptomycin B | Blocks the interaction of CRM1 (exportin 1) with nuclear export signals, inhibiting nuclear protein export |
| 11345 | Paxilline | Inhibits large conductance Ca^{2+} -activated K^+ (BKCa) channels in patch clamp and whole smooth muscle cell studies ($K_S = 1.9$ and $35.7 nM$, respectively) |
| 13346 | Rapamycin | An allosteric inhibitor of mammalian target of rapamycin (mTOR) complex 1 (mTORC1) |
| 29735 | YM-254890 | An inhibitor of platelet aggregation and $G\alpha_{q/11}$ -mediated intracellular calcium mobilization |

Cancer

| Item No. | Product Name | Summary |
|----------|---------------------|-----------------------------------------------------------------------------------------------------------------------|
| 20133 | Asukamycin | Inhibits the growth of various tumor cell lines ($IC_{50} = 1-5 \mu M$) 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 $0.2 \mu M$, preventing tumor cell migration |
| 15387 | Galiellalactone | Inhibits IL-6-mediated JAK/STAT signal transduction in HepG2 cells ($IC_{50} = 0.25-0.5 \mu M$) |
| 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

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 ₂ 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 μ M, respectively) |
| 10007448 | Triacsin C | Inhibitor of long fatty acid acyl-CoA synthetase ($IC_{50} = 6.3$ μ 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

Toxins

Mycotoxins

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

See all mycotoxins at www.caymanchem.com

Microcystins & Other Cyanotoxins

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

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Tools for Toxin Quantification

Mycotoxin Mixture 5 (CRM)

Item No. 28151

- Contains aflatoxin B₁, B₂, G₁, G₂, and ochratoxin A at 10 μ 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

