ALEXIS® BIOCHEMICALS

TOPIX NEWSLETTER

Tomorrow's Reagents Manufactured Today®

4 / 2007

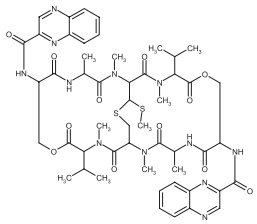
Contents

International Edition

SPECIAL FOCUS: Natural Products & Rare Antibiotics

Potent Inhibitor of HIF-1

NEW **Echinomycin**
[Quinomycin A]
ALX-380-201-M001 1 mg
ALX-380-201-M005 5 mg



For Details see Page 13

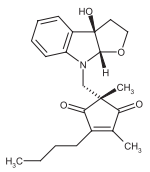
Potent IL-6 Inhibitor

NEW

(+)-Madindoline A
ALX-350-328-MC05 0.5 mg
ALX-350-328-M001 1 mg

Binds competitively but noncovalently to the extracellular domain of the membrane glycoprotein gp130 and inhibits the homodimerization of the trimeric IL-6/IL-6R/gp130 or the IL-11/gp130 complex [1-3], thus inhibiting activation of the JAK/STAT signal transduction pathway. Potent IL-6 inhibitor.

LIT: [1] M. Hayashi, et al.; J. Antibiot. **49,** 1091 (1996) ▪ **[2]** S.Takamatsu, et. al.; J. Antibiot. **50,** 1069 (1997) ▪ **[3]** A.Z. Saleh, et al.; Biochemistry **44,** 10822 (2005)



Ask for Free Copy of Product Flyer "Madindoline A" on www.axxora.com

For Details see Page 15

Water Soluble Derivative of Rebeccamycin

NEW

Becatecarin
ALX-380-119-C250 250 µg
ALX-380-119-M001 1 mg

- Available from Stock - Type I Ribosome Inactivating Protein

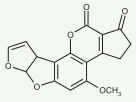
Gelonin
ALX-350-150-M001 1 mg

Latest Additions RARE ANTIBIOTICS see Pages 12-13
Latest Additions NATURAL PRODUCTS see Pages 14-15

Mycotoxins

Fungal Secondary Metabolites & Contaminants of Foods and Feeds

Aflatoxins



Aflatoxin B_1

Aflatoxin B_1

ALX-630-093-M001	1 mg
ALX-630-093-M005	5 mg

Isolated from *Aspergillus flavus*. Aflatoxins are naturally occuring mycotoxins that are produced by many species of *Aspergillus*. They are metabolized by the liver to a reactive intermediate, aflatoxin M_1, an epoxide. High-level aflatoxin exposure produces an acute necrosis, cirrhosis, and carcinoma of the liver exhibited by hemorrage, acute liver damage, edema, alteration in digestion and absorption and/or metabolism of nutrients.

LIT: Molecular dosimetry of aflatoxin exposure: contribution to understanding the multifactorial etiopathogenesis of primary hepatocellular carcinoma with particular reference to hepatitis B virus: C.P. Wild, et al.; Environ. Health Perspect. **99,** 115 (1993) ▪ A follow-up study of urinary markers of aflatoxin exposure and liver cancer risk in Shanghai, People's Republic of China: G.S. Qian, et al.; Cancer Epidemiol. Biomarkers Prev. **3,** 3 (1994) ▪ Aflatoxin B1 induced lacI mutation in liver and kidney of transgenic mice C57BL/6N: effect of phorone: H. Autrup, et al.; Mutagenesis **11,** 69 (1996)

Aflatoxin B_2

ALX-630-103-M001	1 mg
ALX-630-103-M005	5 mg

Aflatoxin G_1

ALX-630-104-M001	1 mg
ALX-630-104-M005	5 mg

Aflatoxin G_2

ALX-630-106-M001	1 mg
ALX-630-106-M005	5 mg

Aflatoxin M_1

ALX-630-095-MC01	0.1 mg

Alternariol

[AOH; 3,7,9-Trihydroxy-1-methyl-6*H*-dibenzo(b,d)pyran-6-one]

ALX-350-139-M001	1 mg

Isolated from *Alternaria* sp. Important mycotoxin contaminant of fruit and cereal products. Exhibits antifungal and phytotoxic activity. Cholinesterase inhibitor.

LIT: Studies in the biochemistry of micro-organisms. 90. Alternariol and alternariol monomethyl ether, metabolic products of Alternaria tenuis: H. Raistrick, et al.; Biochem. J. **55,** 421 (1953) ▪ Alternariol, a dibenzopyrone mycotoxin of Alternaria spp., is a new photosensitizing and DNA cross-linking agent: F. DiCosmo and N.A. Straus; Experientia **41,** 1188 (1985) ▪ Mutagenicity of the mycotoxin alternariol in cultured mammalian cells: E.M. Brugger, et al.; Toxicol. Lett. **164,** 221 (2006) ▪ Estrogenic and clastogenic potential of the mycotoxin alternariol in cultured mammalian cells: L. Lehmann, et al.; Food Chem. Toxicol. **44,** 398 (2006)

Citrinin

[Antimycin]

ALX-380-058-M001	1 mg
ALX-380-058-M005	5 mg
ALX-380-058-M010	10 mg
ALX-380-058-M025	25 mg

Isolated from *Penicillium citrinum*. Antibiotic. Induces mitochondrial permeability pore opening and inhibits respiration by interfering with complex I of the respiratory chain. Nephrotoxin. Mycotoxin. Causes mycotoxic nephropathy in livestock and has been implicated as a cause of Balkan nephropathy and yellow rice fever in humans.

LIT: Mechanism of citrinin-induced dysfunction of mitochondria. III. Effects on renal cortical and liver mitochondrial swelling: G.M. Chagas, et al.; J. Appl. Toxicol. **15,** 91 (1995) ▪ Mycotoxins: J.W. Bennett & M. Klich; Clin. Microbiol. Rev. **16,** 497 (2003)

Cyclopiazonic acid

[CPA]

ALX-350-023-M005	5 mg
ALX-350-023-M025	25 mg
ALX-350-023-M100	100 mg

Isolated from *Penicillium griseofulvum*. Mycotoxin. Cell permeable, reversible inhibitor of Ca^{2+}-ATPases.

LIT: Cyclopiazonic acid is a specific inhibitor of the Ca2+-ATPase of sarcoplasmic reticulum: N.W. Seidler, et al.; J. Biol. Chem. **264,** 17816 (1989)

NEW Fumigaclavine A

ALX-630-110-M001	1 mg
ALX-630-110-M005	5 mg

Isolated from *Aspergillus* sp. Ergot alkaloid. Mycotoxin.

LIT: Mycotoxins produced by Aspergillus fumigatus isolated from silage: R.J. Cole, et al.; Ann. Nutr. Aliment. **31,** 685 (1977) ▪ Post-genome research on the biosynthesis of ergot alkaloids: S.M. Li & I.A. Unsold; Planta Med. **72,** 117 (2006)

Fumitremorgin C

[FTC; SM-Q]

ALX-350-127-C250	250 µg

Isolated from *Aspergillus fumigatus*. Fungal toxin. Tremorgenic. Potent and specific inhibitor of the breast cancer resistance protein (BCRP; ABCG2). Reverses multidrug resistance mediated by BCRP and increases cytotoxicity of several anticancer agents *in vitro*.

LIT: Mycotoxins produced by Aspergillus fumigatus species isolated from molded silage: R.J. Cole, et al.; J. Agric. Food Chem. **25,** 826 (1977) ▪ Novel mammalian cell cycle inhibitors, tryprostatins A, B and other diketopiperazines produced by Aspergillus fumigatus. I. Taxonomy, fermentation, isolation and biological properties: C.B. Cui, et al.; J. Antibiot. **49,** 527 (1996) ▪ Fumitremorgin C reverses multidrug resistance in cells transfected with the breast cancer resistance protein.: S.K. Rabindran, et al.; Cancer Res. **60,** 47 (2000)

Fumonisin B_1

ALX-350-017-M001	1 mg
ALX-350-017-M005	5 mg

Isolated from *Fusarium moniliforme*. Mycotoxin. Induces cancer. Inhibitor of sphingosine biosynthesis. Induces apoptosis.

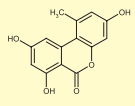
LIT: Inhibition of sphingolipid biosynthesis by fumonisins. Implications for diseases associated with Fusarium moniliforme: E. Wang, et al.; J. Biol. Chem. **266,** 14486 (1991) ▪ Biological activities of fumonisins, mycotoxins from Fusarium moniliforme, in jimsonweed (Datura stramonium L.) and mammalian cell cultures: H.K. Abbas, et al.; Toxicon **31,** 345 (1993) ▪ Fumonisins and Alternaria alternata lycopersici toxins: sphinganine analog mycotoxins induce apoptosis in monkey kidney cells: H. Wang, et al.; PNAS **93,** 3461 (1996)

Fumonisin B_2

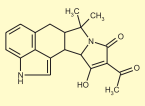
ALX-350-237-M001	1 mg

Isolated from *Fusarium moniliforme*. Mycotoxin, structurally similar to fumonisin B_1 (Prod. No. ALX-350-017). Carcinogenic. Inducer of apoptosis.

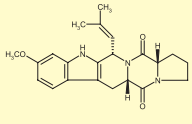
LIT: Biological activities of fumonisins, mycotoxins from Fusarium moniliforme, in jimsonweed (Datura stramonium L.) and mammalian cell cultures: H.K. Abbas, et al.; Toxicon **31,** 345 (1993) ▪ Liquid chromatographic determination of the mycotoxin fumonisin B2 in physiological samples: G.S. Shephard, et al.; J. Chromatogr. A **692,** 39 (1995) ▪ Fumonisins and Alternaria alternata lycopersici toxins: sphinganine analog mycotoxins induce apoptosis in monkey kidney cells: H. Wang, et al.; PNAS **93,** 3461 (1996)



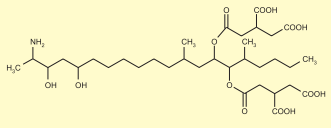
Alternariol



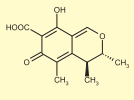
Cyclopiazonic acid



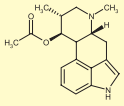
Fumitremorgin C



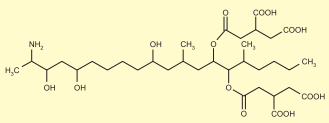
Fumonisin B_2



Citrinin



Fumigaclavine A



Fumonisin B_1

Mycotoxins

Mycotoxins are fungal secondary metabolites produced by molds that have been associated with severe toxic effects to vertebrates produced by many important phytopathogenic and food spoilage fungi including *Aspergillus, Penicillium, Fusarium,* and *Alternaria species.*

Their frequent presence in food and their severe toxic, carcinogenic and estrogenic properties have been recognized as potential threat to human health. A reliable risk assessment of mycotoxin contamination for humans and animals relies basically on their unambiguous identification and accurate quantification in food and feed stuff. Therefore accurate screening methods for mycotoxins and their availability as reference compounds are essential. ALEXIS® Biochemicals offers a wide panel of mycotoxins.

Selected Review Articles

The toxicology of mycotoxins: Y. Ueno; Crit. Rev. Toxicol. **14,** 99 (1985) ▪ DNA damage by mycotoxins: J.S. Wang & J.D. Groopman; Mutat. Res. **424,** 167 (1999) ▪ Nutritional and health implications of mycotoxins in animal feeds: A review: K.E. Akande, et al.; Pakistan J. Nutr. **5,** 398 (2006) ▪ Recent advances in mycotoxin determination in food and feed by hyphenated chromatographic techniques/mass spectrometry: S. Sforza, et al.; Mass Spectrom. Rev. **25,** 54 (2006) ▪ Mycotoxin contamination of food in Europe: early detection and prevention strategies: N. Magan; Mycopathologia **162,** 245 (2006) ▪ Trace mycotoxin analysis in complex biological and food matrices by liquid chromatography-atmospheric pressure ionisation mass spectrometry: P. Zollner & B. Mayer-Helm; J. Chromatogr. A **1136,** 123 (2006)

Gliotoxin

[[3R-(3α, 5aβ,6β,10aα)]-2,3,5a,6-Tetrahydro-6-hydroxy-3-(hydroxymethyl)-2-methyl-10*H*-3,10a-epi-dithiopyrazino[1,2-a] indole-1,4-dione]

ALX-350-239-M001 1 mg

Isolated from *Gladiocladium fimbriatum*. Immunomodulating mycotoxin which acts by blocking membrane thiol groups. Causes apoptotic cell death in macrophages and thymocytes. Induces Ca^{2+} release from intact rat liver mitochondria.

LIT: Identification of an agent in cultures of Aspergillus fumigatus displaying anti-phagocytic and immunomodulating activity in vitro: A. Müllbacher, et al.; J. Gen. Microbiol. **131,** 1251 (1985) ▪ Gliotoxin stimulates Ca2+ release from intact rat liver mitochondria: M. Schweizer & C. Richter; Biochemistry **33,** 13401 (1994) ▪ Extracellular calcium is not required for gliotoxin or dexamethasone- induced DNA fragmentation: a reappraisal of the use of EGTA: P. Waring & A. Sjaarda; Int. J. Immunopharmacol. **17,** 403 (1995)

NEW Moniliformin . Na

[1-Hydroxycyclobut-1-ene-3,4-dione . Na]

ALX-630-111-M001 1 mg
ALX-630-111-M005 5 mg

Isolated from *Fusarium moniliforme*. Mycotoxin. Genotoxic.

LIT: Structure and synthesis of moniliformin, a novel cyclobutane microbial toxin: J.P. Springer, et al.; JACS **96,** 2267 (1974) ▪ Moniliformin, a mycotoxin from Fusarium fusarioides: C.J. Rabie, et al.; J. Agric. Food Chem. **26,** 375 (1978) ▪ Isolation and purification of moniliformin: M. Steyn, et al.; J. Assoc. Off. Anal. Chem. **61,** 578 (1978) ▪ A molecular mechanism for the toxic action of moniliformin, a mycotoxin produced by Fusarium moniliforme: P.G. Thiel; Biochem. Pharmacol. **27,** 483 (1978) ▪ Genotoxic effects of three Fusarium mycotoxins, fumonisin B1, moniliformin and vomitoxin in bacteria and in primary cultures of rat hepatocytes: S. Knasmuller, et al.; Mutat. Res. **391,** 39 (1997)

Ochratoxin A

ALX-630-089-M001 1 mg
ALX-630-089-M005 5 mg
ALX-630-089-M025 25 mg

Isolated from *Aspergillus ochraceus*. Mycotoxin. Natural contaminant of mouldy food and feed. It has a number of toxic effects, the most prominent being nephrotoxicity. Furthermore, ochratoxin A is immunosuppressive, genotoxic, teratogenic and carcinogenic. Stimulates lipid peroxidation.

LIT: Lipid peroxidation as a possible cause of ochratoxin A toxicity: A.D. Rahimtula, et al.; Biochem. Pharmacol. **37,** 4469 (1988) ▪ Mechanism of ochratoxin A stimulated lipid peroxidation: R.F. Omar, et al.; Biochem. Pharmacol. **40,** 1183 (1990) ▪ Toxicity and metabolism of ochratoxin A: J. Fink-Gremmels, et al.; Nat. Toxins **3,** 214 (1995)

Patulin

[4-Hydroxy-4*H*-furo[3,2-c]pyran-2(6*H*)-one; Clairformin; Clavacin; Clavatin; Claviformin; Expansin; Gigantin; Leucopin; Mycoin C3; Mycosin; Penicidin]

ALX-270-111-M001 1 mg
ALX-270-111-M005 5 mg

Isolated from *Penicillium expansum*. Inhibitor of protein farnesylation in a cell free assay. Inhibits incorporation of tritiated mevalonate into proteins in whole cells. Mycotoxin with anti-bacterial, potassium uptake inhibitory and possibly carcinogenic activities.

LIT: Inhibition of protein prenylation by patulin: S. Miura, et al.; FEBS Lett. **318,** 88 (1993)

Paxilline

ALX-630-019-M001 1 mg
ALX-630-019-M005 5 mg
ALX-630-019-M010 10 mg

Isolated from *Penicillium paxilli*. Fungal mycotoxin with potent excitatory action on acetylcholine release from nerve terminals. Paxilline is a specific and potent blocker of smooth muscle high-conductance Ca^{2+}-activated K^+ channels.

LIT: A new tremorgenic metabolite from Penicillium paxilli: R.J. Cole, et al.; Can. J. Microbiol. **20,** 1159 (1974) ▪ Characterization of high affinity binding sites for charybdotoxin in synaptic plasma membranes from rat brain. Evidence for a direct association with an inactivating, voltage-dependent, potassium channel: J. Vazquez, et al.; J. Biol. Chem. **265,** 15564 (1990) ▪ Tremorgenic indole alkaloids potently inhibit smooth muscle high- conductance calcium-activated potassium channels: H.-G. Knaus, et al.; Biochemistry **33,** 5819 (1994)

Penitrem A

ALX-630-020-M001 1 mg
ALX-630-020-M005 5 mg

Isolated from *Penicillium palitans*. Fungal mycotoxin, which increases the spontaneous release of GABA and aspartate from cerebrocortical synaptosomes in rat neuromuscular junction. Specific and potent blocker of smooth muscle high-conductance Ca^{2+}-activated K^+ channels.

LIT: Effects of a fungus tremorgenic toxin (penitrem A) on transmission in rat phrenic nerve-diaphragm preparations: B.J. Wilson, et al.; Brain Res. **40,** 540 (1972) ▪ Tremorgenic indole alkaloids potently inhibit smooth muscle high-conductance calcium-activated potassium channels: H.G. Knaus, et al.; Biochemistry **33,** 5819 (1994)

T-2 Toxin

[4β,15-Diacetoxy-3α-hydroxy-8α-(3-methylbutyryloxy)-12,13-epoxytrichothec-9-ene]

ALX-630-101-M001 1 mg
ALX-630-101-M005 5 mg

Isolated from *Fusarium sp*. Mycotoxin. Induces DNA damage and apoptosis. Increases blood-brain barrier permeability and inhibits monoamine oxidase activity in the brain.

LIT: Apoptotic cellular damage in mice after T-2 toxin-induced acute toxicosis: T. Ihara, et al.; Nat. Toxins **5,** 141 (1997) ▪ T-2 toxin induces thymic apoptosis in vivo in mice: Z. Islam, et al.; Toxicol. Appl. Pharmacol. **148,** 205 (1998) ▪ T-2 toxin-induced apoptosis in hematopoietic tissues of mice: J. Shinozuka, et al.; Toxicol. Pathol. **26,** 674 (1998) ▪ Thymocyte apoptosis by T-2 toxin in vivo in mice is independent of Fas/Fas ligand system: A.M. Murshedul, et al.; Biosci. Biotechnol. Biochem. **64,** 210 (2000)

Zearalenone

[Benzoxacyclotetradecin-1,7(8*H*)-dione]

ALX-630-105-M010 10 mg
ALX-630-105-M050 50 mg

Isolated from *Fusarium graminearum*. Estrogenic mycotoxin in animals and a phytohormone in plants. Inducer of sister chromatid exchange and chromosomal aberration. Acts as a protonophoric uncoupler in plant mitochondria.

LIT: Review on the toxicity, occurrence, metabolism, detoxification, regulations and intake of zearalenone: an oestrogenic mycotoxin: A. Zinedine, et al.; Food Chem. Toxicol. **45,** 1 (2007)

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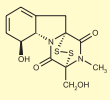
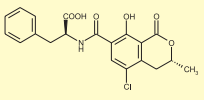
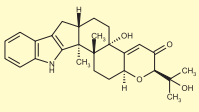
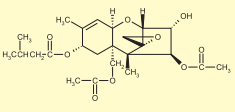
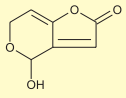

Gliotoxin

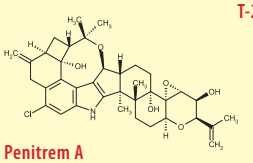

Ochratoxin A

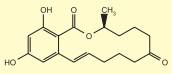

Paxilline


T-2 Toxin

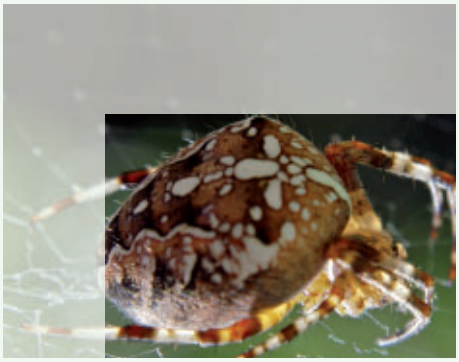

Moniliformin . Na


Patulin


Penitrem A


Zearalenone

Ecdysteroids



Ecdysteroids are a group of tetracyclic polyhydroxylated compounds present in small amounts in most classes of invertebrates. In insects, crustaceans and other arthropods, they play a fundamental role in controlling many important physiological functions related to development, reproduction, metabolism, excretion, and others. Ecdysteroids are also widely spread in the plant kingdom. This has resulted in the isolation of a large number of these compounds in substantial amounts, thus allowing extensive studies on chemical behaviour, biological activity, biosynthesis and metabolism. Studies suggest a beneficial role of ecdysteroids on mammals (e.g. hypoglycaemic, hypocholesterolaemic and anabolic effects). Ecdysteroids are widely used as inducers for gene switch systems based on insect ecdysteroid receptors and genes of interest placed under the control of ecdysteroid-response elements. The ecdysone-inducible system has proved useful for studying a multitude of processes, such as apoptosis, cancer and cell-cycle regulation, embryonic development, signal transduction, lipid metabolism, and neuronal function. The strength of the system appears to be its tight regulation, its dose responsiveness, and the favorable uptake and clearance kinetics of the steroid inducer, which results in rapid gene switching [1-4].

Muristerone A (MurA) [5-7], isolated from kaladana seeds, is a member of the ecdysteroid family. MurA regulates the metamorphosis of Drosophila melanogaster (via the ecdysone receptor [8], a member of the nuclear receptor superfamily) and is used to induce expression of the gene of interest from any of the ecdysone-inducible system expression vectors. A regulatory system which reveals MurA to be an efficient and potent inducer of gene expression in culture mammalian cells and transgenic mice has been described [9, 10].

Ponasterone A (PonA) [11-14] is an analog of ecdysone (Prod. No. ALX-370-011) with similar properties to MurA (Prod. No. ALX-370-010). It is a functional, reliable and economical substitute for muristerone A as an inducer for the ecdysone-inducible mammalian expression system. Results show that PonA was able to induce expression of β-galactosidase to levels similar to those obtained with MurA induction.

LIT: [1] Identification of ligands and coligands for the ecdysome-regulated gene switch: E. Saez, et al.; PNAS **97**, 14512 (2000) ▪ **[2]** Practical uses for ecdysteroids in mammals including humans: an update: R. Lafont & L. Dinan; J. Insect. Sci. **3,** 7 (2003) (Review) ▪ **[3]** Effects and applications of arthropod steroid hormones (ecdysteroids) in mammals: L. Dinan & R. Lafont; J. Endocrinol. **191**, 1 (2006) (Review) ▪ **[4]** Functional characterization of ecdysone receptor gene switches in mammalian cells: S.K. Panguluri, et al.; FEBS J. **273**, 5550 (2006) ▪ **[5]** Structure of muristerone A, a new phytoecdysone: L. Canonica, et al.; J.C.S. Chem. Commun. 1060 (1972) ▪ **[6]** A novel method of isolation of phytoecdysones from kaladana seeds: L. Canonica, et al.; Phytochemistry **14**, 525 (1975) ▪ **[7]** New phytoecdysones from kalanda. I. Structure of muristerone A and kaladasterone; L. Canonica, et al.; Gazz. Chim. Ital. **107**, 123 (1977) ▪ **[8]** Characterization and partial purification of the Drosophila Kc cell ecdysteroid receptor: T.M. Landon, et al.; J. Biol. Chem. **263**, 4693 (1988) ▪ **[9]** Ecdysone-inducible gene expression in mammalian cells and transgenic mice: D. No, et al.; PNAS **93**, 3346 (1996) ▪ **[10]** Controlling mammalian gene expression with small molecules: T. Clackson; Curr. Opin. Chem. Biol. **1**, 210 (1997) ▪ **[11]** Insect Hormones. The Structure of Ponasterone A, an Insect-Moulting Hormone from the Leaves of Podocarpus nakaii hay: K. Nakanishi, et al.; J.C.S. Chem. Commun. 915 (1966) ▪ **[12]** Insect Hormones, VI. Confirmation of the Skeletal Structure of Ponasterone A. Moriyama & K. Nakanishi.; THL **23**, 111 (1968) ▪ **[13]** Ponasterones, compounds with molting hormone activity: K. Nakanishi, et al.; Bull. Soc. Chim. France 3475 (1969) ▪ **[14]** Past and present studies with ponasterones, the first insect moulting hormones from plants: K. Nakanishi; Steroids **57**, 649 (1992)

Ecdysone

[α-Ecdysone; 2β,3β,14α,22R,25-Pentahydroxy-5β-cholest-7-en-6-one]

ALX-370-011-M001	1 mg
ALX-370-011-M005	5 mg
ALX-370-011-M010	10 mg

20-Hydroxyecdysone

[β-Ecdysone; 2β,3β,14α,20R,22R,25-Hexahydroxy-5β-cholest-7-en-6-one; Ecdysterone]

ALX-370-012-M005	5 mg
ALX-370-012-M010	10 mg
ALX-370-012-M050	50 mg

Makisterone A

[2β,3β,14α,20R,22R,25-Hexahydroxy-5β-24R-ergost-7-en-6-one]

ALX-370-013-C250	250 µg
ALX-370-013-M001	1 mg

Muristerone A

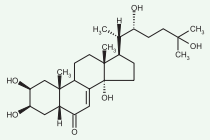
[2β,3β,5β,11α,14α,20R,22R-Heptahydroxycholest-7-en-6-one]

ALX-370-010-C100	100 µg
ALX-370-010-C250	250 µg
ALX-370-010-C500	500 µg
ALX-370-010-M001	1 mg
ALX-370-010-M010	10 mg

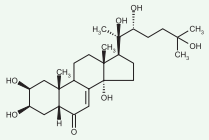
Ponasterone A

[25-Deoxy-20-hydroxyecdysone; 25-Deoxyecdysterone; 2β,3β,14α,20R,22R-Pentahydroxy-5β-cholest-7-en-6-one]

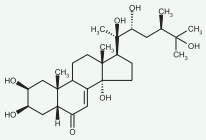
ALX-370-014-M001	1 mg
ALX-370-014-M005	5 mg
ALX-370-014-M100	100 mg



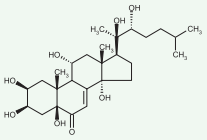
Ecdysone



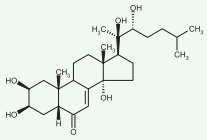
20-Hydroxyecdysone



Makisterone A



Muristerone A



Ponasterone A

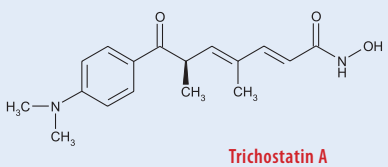
HDAC Inhibitor

Potent Reversible HDAC Inhibitor

Trichostatin A

ALX-380-068-M001	1 mg
ALX-380-068-M005	5 mg

Isolated from *Streptomyces hygroscopicus*. Potent, reversible inhibitor of histone deacetylase (HDAC). Mediates the activation of O^6-methylguanine-DNA methyltransferase (MGMT). May be involved in cell cycle progression of several cell types, induces cell growth arrest at both G1 and G2/M phases. Induces apoptosis in some cases.

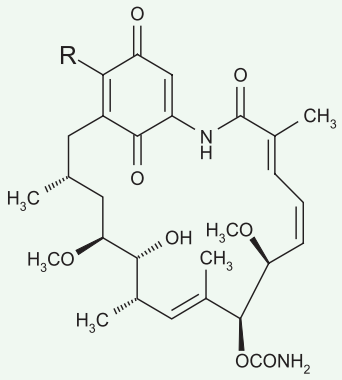


Trichostatin A

LIT: A new antifungal antibiotic, trichostatin: N. Tsuji, et al.; J. Antibiot. **29,** 1 (1976) ▪ Potent and specific inhibition of mammalian histone deacetylase both in vivo and in vitro by trichostatin A: M. Yoshida, et al.; J. Biol. Chem. **265,** 17174 (1990) ▪ Trichostatin A and trapoxin: novel chemical probes for the role of histone acetylation in chromatin structure and function: M. Yoshida, et al.; Bioessays **17,** 423 (1995) ▪ Regulation of the human O6-methylguanine-DNA methyltransferase gene by transcriptional coactivators cAMP response element-binding protein- binding protein and p300: K.K. Bhakat & S. Mitra; J. Biol. Chem. **275,** 34197 (2000) ▪ Trichostatin A is a histone deacetylase inhibitor with potent antitumor activity against breast cancer in vivo: D.M. Vigushin, et al.; Clin. Cancer Res. **7,** 971 (2001) ▪ Chromatin remodeling agent trichostatin A: a key-factor in the hepatic differentiation of human mesenchymal stem cells derived of adult bone marrow: S. Snykers, et al.; BMC Dev. Biol. **7,** 24 (2007)

Geldanamycin

and its Cousins 17-AAG & 17-DMAG – Inhibitors of HSP90



Geldanamycin: R=OCH_3
17-AAG: R=$NHCH_2CH=CH_2$
17-DMAG: R=$NHCH_2CH_2N(CH_3)_2$

From L. M. Jarvis, C & EN, February 26, 2007 (www.cen-online.org)

HSP90, a molecular chaperone, has become a target for cancer therapies. Over the years, researchers in academia as well as industry were helping to define HSP90's complicated role in protein maintenance. Yet HSP90 is a special kind of heat shock protein; it is very selective about which proteins it will help. Proteomics analysis shows that HSP90 is probably physically interacting with about 300 proteins. More important, the majority of the 300 proteins that HSP90 interacts with – known as client proteins – have regulatory functions. Many of these regulatory proteins play a role in pathways that are impacted by cancer. It appears that drugs that inhibit HSP90 are somehow more selective for HSP90 in cancer cells than for that in normal cells. Not only is HSP90 selective regarding the proteins it interacts with, but there is an entire machinery of other heat shock proteins and chaperone proteins that form complexes with HSP90 to assist in introducing to its clients.

Pearl, and his colleagues at the Institute of Cancer Research published the complete crystal structure of HSP90 bound to the energy-transfer nucleotide adenosine 5'-triphosphate (ATP) [1]. They showed how HSP90 hydrolyzes ATP. HSP90 must hook up with ATP to accomplish its job of helping other proteins be the best they can be. The binding and metabolism of ATP is absolutely critical for HSP90's chaperone function. One of the pleasing things about HSP90 as a drug target from a chemist's point of view is that the pocket is a very deep, very defined binding site with very few direct contacts between ATP and the protein itself. The space is flexible enough to accommodate drugs with a range of structures.

Companies synthesizing inhibitors of HSP90 fall into two main categories: those pursuing drugs based on the natural products that were first identified as inhibiting the protein and those pushing small molecules designed around the structure and function of HSP90 bound to ATP and its client proteins. Both camps are attacking the same binding site, the pocket created when HSP90 hooks up with ATP. The natural product camp is focused mainly on geldanamycin, an antibiotic in soil microorganisms that was the first molecule found to inhibit HSP90. Geldanamycin [2, 3] was discovered back in the 1980s. Geldanamycin, although extremely potent, has a quinone moiety that turns it into an electrophile. In addition to being highly reactive, the compound is also highly insoluble – a deadly combination in drug discovery.

17-AAG (17-(Allylamino)-17-desmethoxygeldanamycin) [4, 5], an analog of geldanamycin retains the quinone found in geldanamycin but replaces a methoxy arm with an allylamino group to minimize the reactivity problem. Although that tweak does not address geldanamycin's lack of solubility.

17-DMAG (17-[2-(Dimethylamino)ethyl]amino-17-desmethoxygeldanamycin) [6, 7], is an analog with side chain modifications, that improve the drug's half life and potency. The drug is water soluble, which means it can be administered intravenously or orally.

While the quinone ansamycins geldanamycin, 17-AAG, herbimycin A and the chemically unrelated radicicol bind to the N-terminal ATP-binding domain of HSP90 family members (HSP90, Grp94 and TRAP-1), cisplatin and novobiocin interact with the C-terminal ATP-binding domain of HSP90 [8, 9].

LIT: [1] Crystal structure of an Hsp90-nucleotide-p23/Sba1 closed chaperone complex: M.M. Ali, et al.; Nature **440,** 1013 (2006) ▪ **[2]** Geldanamycin, a new antibiotic: C. DeBoer, et al.; J. Antibiot. **23,** 442 (1970) ▪ **[3]** Geldanamycin as a potential anti-cancer agent: its molecular target and biochemical activity: L. Neckers, et al.; Invest. New Drugs **17,** 361 (1999), (Review) ▪ **[4]** Inhibition of the oncogene product p185erbB-2 in vitro and in vivo by geldanamycin and dihydrogeldanamycin derivatives: R.C. Schnur, et al.; J. Med. Chem. **38**, 3806 (1995) ▪ **[5]** The benzoquinone ansamycin 17-allylamino-17-demethoxygeldanamycin binds to HSP90 and shares important biologic activities with geldanamycin: T.W. Schulte & L.M. Neckers; Cancer Chemother. Pharmacol. **42,** 273 (1998) ▪ **[6]** Pharmacokinetics, tissue distribution, and metabolism of 17-(dimethylaminoethylamino)-17-demethoxygeldanamycin (NSC 707545) in CD2F1 mice and Fischer 344 rats: M.J. Egorin, et al.; Cancer Chemother. Pharmacol. **49,** 7 (2002) ▪ **[7]** Crystal structure and molecular modeling of 17-DMAG in complex with human Hsp90: J.M. Jez, et al.; Chem. Biol. **10**, 361 (2003) ▪ **[8]** Interaction of radicicol with members of the heat shock protein 90 family of molecular chaperones: T.W. Schulte, et al.; Mol. Endocrinol. **13,** 1435 (1999) ▪ **[9]** The heat shock protein 90 antagonist novobiocin interacts with a previously unrecognized ATP-binding domain in the carboxyl terminus of the chaperone: M.G. Marcu et al.; J. Biol. Chem. **275**, 37181 (2000)

Products

17-AAG

[17-(Allylamino)-17-desmethoxygeldanamycin; Allylaminogeldanamycin]

ALX-380-091-C100	100 µg
ALX-380-091-M001	1 mg

17-DMAG

[17-[2-(Dimethylamino)ethyl]amino-17-desmethoxygeldanamycin; NSC 707545]

ALX-380-110-C100	100 µg
ALX-380-110-M001	1 mg

Geldanamycin

ALX-380-054-C100	100 µg
ALX-380-054-C500	500 µg
ALX-380-054-M001	1 mg

Other HSP90 Inhibitors

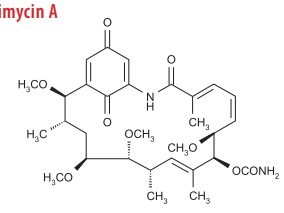
Herbimycin A

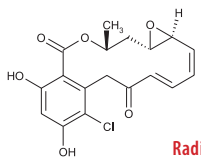
ALX-350-029-C100	100 µg
ALX-350-029-M001	1 mg

Inhibitor of HSP90 binding to the N-terminal ATP-binding domain of HSP90 family members.

LIT: Herbimycin, a new antibiotic produced by a strain of Streptomyces: S. Omura, et al.; J. Antibiot. (Tokyo) **32**, 255 (1979) ▪ A new activity of herbimycin A: inhibition of angiogenesis: T. Yamashita, et al.; J. Antibiot. (Tokyo) **42**, 1015 (1989) ▪ Stimulation by Bt2cAMP of epidermal mucous metaplasia in retinol- pretreated chick embryonic cultured skin, and its inhibition by herbimycin A, an inhibitor for protein-tyrosine kinase: A. Obinata, et al.; Exp. Cell. Res. **193**, 36 (1991) ▪ IgE-induced tyrosine phosphorylation of phospholipase C-gamma 1 in rat basophilic leukemia cells: D.J. Park, et al.; J. Biol. Chem. **266**, 24237 (1991) ▪ Bacterial lipopolysaccharide stimulates protein tyrosine phosphorylation in macrophages: S.L. Weinstein, et al.; PNAS **88**, 4148 (1991) ▪ Inhibition of interleukin 3 and granulocyte-macrophage colony- stimulating factor stimulated increase of active ras.GTP by herbimycin A, a specific inhibitor of tyrosine kinases: T. Satoh, et al.; J. Biol. Chem. **267**, 2537 (1992)

Herbimycin A





Radicicol

Radicicol

[Monordene]

ALX-380-092-M001	1 mg
ALX-380-092-M005	5 mg

Isolated from *Humicola fuscoatra*. Antifungal macrocyclic lactone antibiotic with antimalarial activity. Binds more strongly to HSP90 (nanomolar affinity) than to Gp96 (GRP94). Also binds to yeast HSP90, *E. coli* HtpG and TRAP-1.

LIT: Interaction of radicicol with members of the heat shock protein 90 family of molecular chaperones: T.W. Schulte, et al.; Mol. Endocrinol. **13,** 1435 (1999) ▪ Radicicol represses the transcriptional function of the estrogen receptor by suppressing the stabilization of the receptor by heat shock protein 90: M.O. Lee, et al.; Mol. Cell Endocrinol. **188,** 47 (2002) ▪ Antiviral activity and RNA polymerase degradation following HSP90 inhibition in a range of negative strand viruses: J.H. Connor, et al.; Virology **362,** 109 (2007)

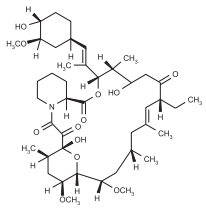
Immunosuppressors/Immunomodulators

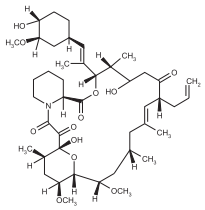
Key Immunosuppressors

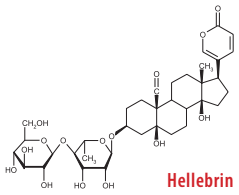
Prod. Name	Prod. No.	Size
Ascomycin	ALX-380-005-M001 ALX-380-005-M005	1 mg 5 mg
Cyclosporin A	ALX-380-002-M100 ALX-380-002-5100 ALX-380-002-G001 ALX-380-002-5001	100 mg 5 x 100 mg 1 g 5 x 1 g
FK506	ALX-380-008-M001 ALX-380-008-M005 ALX-380-008-M025	1 mg 5 mg 25 mg
Rapamycin	ALX-380-004-C100 ALX-380-004-5100 ALX-380-004-M001 ALX-380-004-M005 ALX-380-004-M025	100 µg 5 x 100 µg 1 mg 5 mg 25 mg

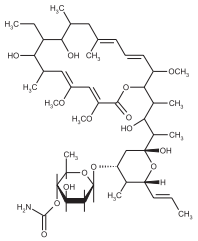
Other Immunosuppressors

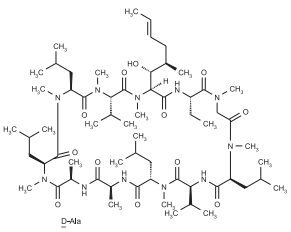
Concanamycin A	ALX-380-034-C025 ALX-380-034-C100 ALX-380-034-M001	25 µg 100 µg 1 mg
Hellebrin	ALX-350-105-M001 ALX-350-105-M005	1 mg 5 mg
Myriocin	ALX-350-274-M005	5 mg
Proscillaridin A	ALX-350-285-M005	5 mg
Triptolide	ALX-350-259-M001 ALX-350-259-M005	1 mg 5 mg

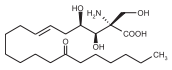

Ascomycin

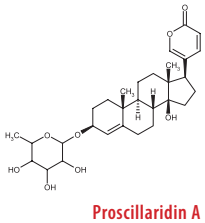

FK506

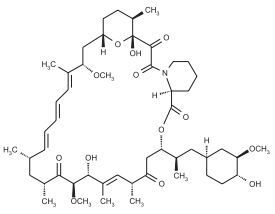

Hellebrin

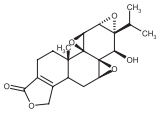

Concanamycin A


Cyclosporin A


Myriocin


Proscillaridin A


Rapamycin


Triptolide

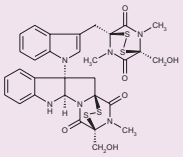
For Immunosuppressant Bufadienolides see Page 10.

Product Highlight

Chetomin

[Chaetomin]

ALX-350-128-M001 1 mg
ALX-350-128-M005 5 mg



Isolated from *Chaetomium species*. Dithiodiketopiperazine inhibitor of HIF-1 formation by disrupting the binding of p300 to both HIF-1α and HIF-2α. Inhibitor of tumor growth. Potent immunosuppressor (Con A-induced (IC_{50}=0.17µg/ml) and LPS-induced (IC_{50}=0.09µg/ml) proliferation of mouse splenic lymphocytes). Antibacterial agent.

LIT: The structure of chetomin: A.G. McInnes, et al.; JACS **98,** 6741 (1976) ▪ Small molecule blockade of transcriptional coactivation of the hypoxia-inducible factor pathway: A.L. Kung, et al.; Cancer Cell **6,** 33 (2004)

Rocaglamide & Derivatives Target NF-AT Activity in T Cells

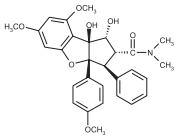
Rocaglamide

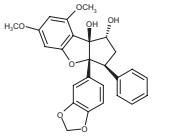
[Rocaglamide A]

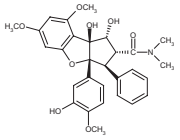
ALX-350-121-C100 100 µg

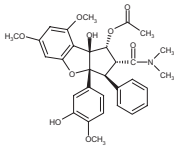
Isolated from *Aglaia sp.* Immunosuppressant. Potent inhibitor of NF-κB activation in T cells, with an almost complete inhibition at 200nM. Suppresses cytokine production (IFN-γ, TNF-α, IL-2 and IL-4) and inhibits NF-AT in peripheral blood T cells at concentrations that do not impair NF-κB and AP-1 activities. In contrast to the immunosuppressant cyclosporin A (Prod. No. ALX-380-002), rocaglamide does not inhibit calcineurin phosphatase activity.

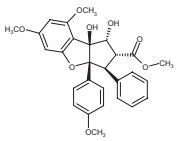
LIT: Rocaglamide derivatives are potent inhibitors of NF-kappa B activation in T-cells: B. Baumann, et al.; J. Biol. Chem. **277,** 44791 (2002) ▪ Rocaglamide derivatives are immunosuppressive phytochemicals that target NF-AT activity in T cells: P. Proksch, et al.; J. Immunol. **174,** 7075 (2005)

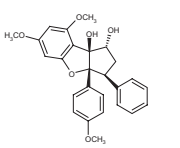

Rocaglamide


Rocaglamide AL


Rocaglamide C


Rocaglamide I


Rocaglamide J


Rocaglaol

Wide Panel of Rocaglamide Derivatives

NEW **Rocaglamide AL**
ALX-350-140-C050 50 µg

NEW **Rocaglamide C**
ALX-350-141-C050 50 µg

NEW **Rocaglamide I**
ALX-350-142-C050 50 µg

NEW **Rocaglamide J**
ALX-350-143-C050 50 µg

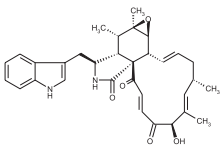
NEW **Rocaglaol**
ALX-350-135-C100 100 µg

Microtubule Modulators

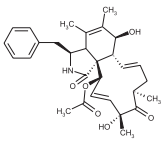
Cytochalasins

Cytochalasins

Prod. Name	Prod. No.	Size
Chaetoglobosin A	ALX-350-131-M001 ALX-350-131-M005	1 mg 5 mg
Cytochalasin A	ALX-380-057-M001 ALX-380-057-M005 ALX-380-057-M010	1 mg 5 mg 10 mg
Cytochalasin B	ALX-380-012-M001 ALX-380-012-M005 ALX-380-012-M025	1 mg 5 mg 25 mg
Cytochalasin B, Dihydro-	ALX-350-053-M001	1 mg
Cytochalasin C	ALX-380-069-M001 ALX-380-069-M005	1 mg 5 mg
Cytochalasin D	ALX-380-031-M001 ALX-380-031-M005	1 mg 5 mg
Cytochalasin E	ALX-380-062-M001 ALX-380-062-M005	1 mg 5 mg



Chaetoglobosin A



Cytochalasin C

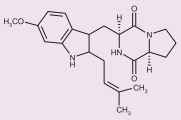
Product Highlight

NEW **Tryprostatin A**

ALX-380-090-C500 500 µg

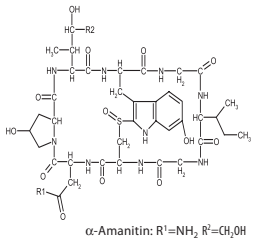
Isolated from *Aspergillus fumigatus*. Inhibitor of microtubule assembly.

LIT: Tryprostatins A and B, novel mammalian cell cycle inhibitors produced by Aspergillus fumigatus: C.B. Cui, et al.; J. Antibiot. **48,** 1382 (1995) ▪ Tryprostatin A, a specific and novel inhibitor of microtubule assembly: T. Usui, et al.; Biochem. J. **333,** 543 (1998)



Amanitins

Isolated from *Amanita phalloides* mushrooms. Inhibits eukaryotic RNA-polymerase II with high efficiency, but not eukaryotic RNA-polymerase I, or bacterial or viral RNA-polymerases. Inhibits mammalian protein synthesis.



α-Amanitin: R^1=NH_2 R^2=CH_2OH
β-Amanitin: R^1=OH R^2=CH_2OH
γ-Amanitin: R^1=NH_2 R^2=CH_3

α-Amanitin
ALX-350-270-M001 1 mg

β-Amanitin
ALX-350-271-M001 1 mg

γ-Amanitin
ALX-350-272-M001 1 mg

Other Modulators

Catharanthine . tartrate
ALX-350-101-M100 100 mg
ALX-350-101-G001 1 g

Isolated from *Catharanthus roseus*. Precursor of vinblastine-type alkaloids.

Colchicine
ALX-380-033-G001 1 g

Isolated from *Colchicum autumnale*. Inhibitor of microtubules by specific binding to tubulin. Induces apoptosis.

LIT: A new colchicine binding assay for tubulin: P. Sherline, et al.; Anal. Biochem. **62,** 400 (1974) ▪ Cytochrome c release and caspase-3 activation during colchicine-induced apoptosis of cerebellar granule cells: A.M. Gorman, et al.; Eur. J. Neurosci. **11,** 1067 (1999) ▪ Colchicine protects mice from the lethal effect of an agonistic anti- Fas antibody: G. Feng & N. Kaplowitz; J. Clin. Invest. **105,** 329 (2000)

Colcemid
ALX-430-033-M001 1 mg
ALX-430-033-M005 5 mg

Semisynthetic. Depolymerizes microtubules and inhibits their formation. Induces apoptosis.

LIT: Colcemid and the mitotic cycle: C.L. Rieder & R.E. Palazzo; J. Cell. Sci. **102**, 387 (1992) ▪ Induction of apoptosis by the anti-tubulin drug colcemid: relationship of mitotic checkpoint control to the induction of apoptosis in HeLa S3 cells: S.W. Sherwood, et al.; Exp. Cell. Res. **215**, 373 (1994) ▪ Colcemid-induced apoptosis of cultured human glioma: electron microscopic and confocal laser microscopic observation of cells sorted in different phases of cell cycle: T. Tsuchida, et al.; Cytometry **31**, 295 (1998)

Podophyllotoxin
ALX-630-086-M100 100 mg

Isolated from *Podophyllum peltatum*. Potent inhibitor of microtubule assembly. Antineoplastic glucoside. Antimitotic agent.

LIT: Podophyllotoxin-resistant mutants of Chinese hamster ovary cells: cross- resistance studies with various microtubule inhibitors and podophyllotoxin analogues: R.S. Gupta; Cancer Res. **43,** 505 (1983)

Vinblastine . sulfate
[VLB . sulfate; Vincaleukoblastine . sulfate]

ALX-350-257-M005 5 mg
ALX-350-257-M025 25 mg

Semisynthetic. Plant alkaloid that arrests the cell cycle in G2/M phase by blocking mitotic spindle formation. Depolymerizes microtubules and blocks binding of tubulin to microtubule proteins. Induces apoptosis. Triggers Raf-1 activation, phosphorylation of Bcl-2 family proteins, induction of p53 expression.

LIT: Microtubule antagonists activate programmed cell death (apoptosis) in cultured rat hepatocytes: K. Tsukidate, et al.; Am. J. Pathol. **143,** 918 (1993) ▪ Vinblastine-induced phosphorylation of Bcl-2 and Bcl-XL is mediated by JNK and occurs in parallel with inactivation of the Raf-1/MEK/ERK cascade: M. Fan, et al.; J. Biol. Chem. **275,** 29980 (2000)

Vincristine . sulfate
[VCR . sulfate; Leukocristine . sulfate]

ALX-350-069-M001 1 mg
ALX-350-069-M005 5 mg

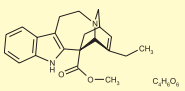
Semisynthetic. Plant alkaloid that arrests the cell cycle in G2/M phase by blocking mitotic spindle formation. Depolymerizes microtubules and blocks binding of tubulin to microtubule proteins. Induces apoptosis. Triggers Raf-1 activation, phosphorylation of Bcl-2 family proteins and induction of p53 expression.

LIT: Cell death induced by vincristine in the intestinal crypts of mice and in a human Burkitt's lymphoma cell line: B.V. Harmon, et al.; Cell Prolif. **25,** 523 (1992) ▪ Vincristine-induced apoptosis in vivo in peripheral blood mononuclear cells of children with acute lymphoblastic leukaemia (ALL): E. Groninger, et al.; Br. J. Haematol. **111,** 875 (2000)

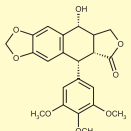
Vindoline
ALX-350-102-M100 100 mg
ALX-350-102-G001 1 g

Isolated from *Catharanthus roseus*. Lacks physiological activity alone but is contained as the pentacyclic moiety in the antineoplastic agents vinblastine and vincristine.

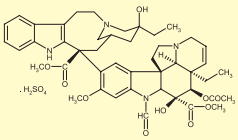
LIT: Antimitotic agents: chemistry and recognition of tubulin molecule: S. Iwasaki; Med. Res. Rev. **13,** 183 (1993)



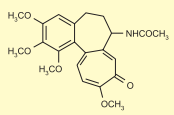
Catharanthine . tartrate



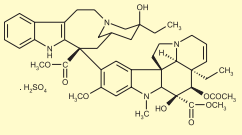
Podophyllotoxin



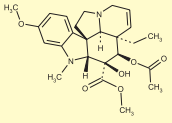
Vincristine . sulfate



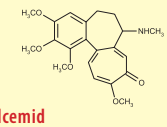
Colchicine



Vinblastine . sulfate



Vindoline



Colcemid

Staurosporine & Related Compounds

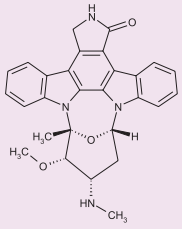
Step up to the Source™

Special Bulk Offer - Staurosporine

Staurosporine

ALX-380-014-C100		100 µg
ALX-380-014-C250		250 µg
ALX-380-014-M001		1 mg
ALX-380-014-M005	BULK	5 mg

Ask for Bulk Quantities!



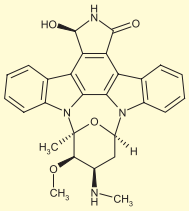
NEW

UCN-01 and UCN-02 – Protein Kinase C Inhibitors

Antibiotic UCN-01

ALX-380-222-M001 1 mg

Isolated from *Streptomyces* sp. Inhibits protein kinase C (PKC) and cyclin-dependent kinase 2 (CDK2) resulting in accumulation of cells in the G1 phase and induction of apoptosis. Enhances the cytotoxicity of other anti-cancer drugs, such as DNA-damaging agents and anti-metabolite drugs, through putative abrogation of G2 and/or S phase accumulation induced by these anti-cancer agents [1].

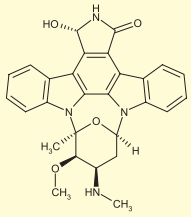


Antibiotic UCN-02

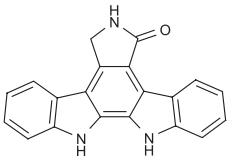
ALX-380-206-M001 1 mg

Isolated from *Streptomyces* sp. Although less selective than its isomer UCN-01, UCN-02 exhibits comparable activity and probably acts by similar mechanisms. Inhibits protein kinase C (PKC) and protein kinase A (PKA) [1].

LIT: [1] UCN-01 and UCN-02, new selective inhibitors of protein kinase C. II. Purification, physico-chemical properties, structural determination and biological activities: I. Takahashi, et al.; J. Antibiot. (Tokyo) **42,** 571 (1989)



K-252c – A Key Aglycone



K-252c

[Staurosporinone; Staurosporine Aglycone]

ALX-380-103-M001 1 mg
ALX-380-103-M005 5 mg

Weak inhibitor of protein kinase C. Aglycone of staurosporine.

FORMULA: $C_{20}H_{13}N_3O$. **MW:** 311.15.

CAS NUMBER: 85753-43-1. **PURITY:** ≥95%

For Bulk Quantities 100 mg / 500 mg / 1 g for Medicinal Chemistry please inquire!

Examples of use:

A: Synthesis of Gö 6976 (Prod. No. ALX-270-021) / Selective mono- or di-alkylation of the indole nitrogens

LIT: Non-glycosidic/non-aminoalkyl-substituted indolocarbazoles as inhibitors of protein kinase C: J. Kleinschroth, et al.; Bioorg. Med. Chem. Lett. **3,** 1959 (1993)

B: K-252c may react under acidic conditions with an appropriate pre-formed furanose to afford furanosylated indolocarbazoles such as K-252a

LIT: Design and implementation of an efficient synthesis approach to furanosylated indolocarbazoles: total synthesis of (+)- and (-)-K252a: J. L. Wood, et al.; JACS **119,** 9641 (1997)

Related Products

K-252a

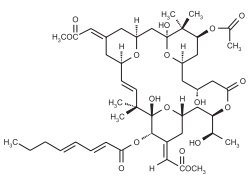
ALX-380-027-C100	100 µg
ALX-380-027-C500	500 µg
ALX-380-027-M001	1 mg

K-252b

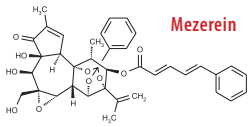
ALX-380-029-C100	100 µg
ALX-380-029-C500	500 µg
ALX-380-029-M001	1 mg

Other PKC Inhibitors

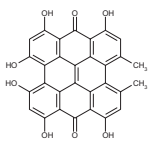
Prod. Name	Prod. No.	Size
Bryostatin 1	ALX-350-005-C010	10 µg
Hypericin (native)	ALX-350-030-M001 ALX-350-030-M005 ALX-350-030-M010	1 mg 5 mg 10 mg
Mezerein (high purity)	ALX-350-042-M001	1 mg
Polymyxin B . sulfate	ALX-380-040-G001 ALX-380-040-G005	1 g 5 g
Resiniferatoxin (high purity)	ALX-550-179-M001 ALX-550-179-M005 ALX-550-179-M050	1 mg 5 mg 50 mg
Thapsigargin	ALX-350-004-M001 ALX-350-004-M005 ALX-350-004-M010 ALX-350-004-M025	1 mg 5 mg 10 mg 25 mg



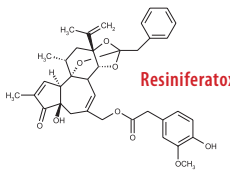
Bryostatin 1



Mezerein

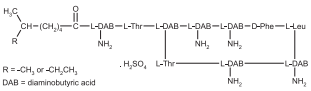


Hypericin (native)

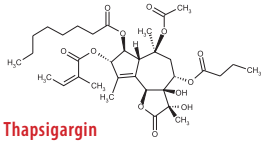


Resiniferatoxin

Polymyxin B . sulfate



R = -CH_3 or -CH_2CH_3
DAB = diaminobutyric acid



Thapsigargin

Phorbols - The Widest Panel

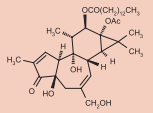
The PMA Source™

Phorbol 12-myristate 13-acetate (PMA; TPA)

Ask for BULK Quantities!

ALX-445-004-M001	1 mg
ALX-445-004-M005	5 mg
ALX-445-004-M010	10 mg
ALX-445-004-M025	25 mg

Most commonly used phorbol ester. Binds to and activates protein kinase C (PKC), causing an extremely wide range of effects in cells and tissues. Very potent mouse skin tumor promoter. Inhibits apoptosis induced by Fas, but induces apoptosis in HL-60 promyelocytic leukemia cells.



Step up to the Source™

12-Deoxyphorbol 13-acetate

[Prostratin; 13-Acetyl-12-deoxyphorbol]

ALX-445-009-M001	1 mg
ALX-445-009-M005	5 mg

Phorbol 12,13-dibutyrate

[PDBu]

ALX-445-001-M001	1 mg
ALX-445-001-M005	5 mg

4α-Phorbol 12,13-dibutyrate

[4α-PDBu]

ALX-445-038-M001	1 mg
ALX-445-038-M005	5 mg

Phorbol 12,13-didecanoate

[PDD]

ALX-445-002-M001	1 mg
ALX-445-002-M005	5 mg

4α-Phorbol 12,13-didecanoate

[4α-PDD]

ALX-445-006-M001	1 mg
ALX-445-006-M005	5 mg

4α-Phorbol 12-myristate 13-acetate

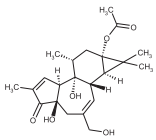
[4α-PMA; 4α-12-O-Tetradecanoylphorbol 13-acetate; 4α-TPA]

ALX-445-005-M001	1 mg
ALX-445-005-M005	5 mg

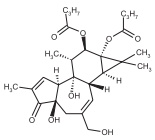
Sapintoxin D (high purity)

[Phorbol 12-N-methylanthranilate (high purity)]

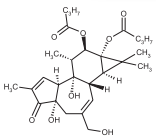
ALX-445-047-M001	1 mg
ALX-445-047-M005	5 mg



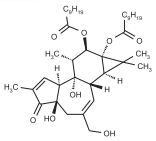
12-Deoxyphorbol 13-acetate



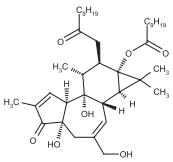
Phorbol 12,13-dibutyrate



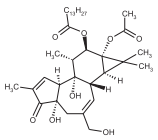
4α-Phorbol 12,13-dibutyrate



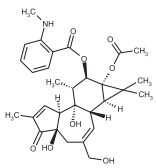
Phorbol 12,13-didecanoate



4α-Phorbol 12,13-didecanoate



4α-Phorbol 12-myristate 13-acetate



Sapintoxin D (high purity)

Phosphatase Inhibitors

Tyrosine Phosphatase Inhibitors

NEW Bakuchiol

[4-(3-Ethenyl-3,7-dimethyl-1,6-octadienyl)phenol]

ALX-350-144-M001	1 mg

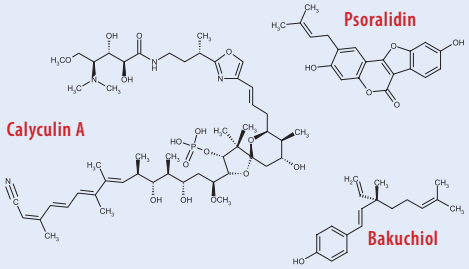
Inhibitor of protein tyrosine phosphatase 1B. Antioxidant. Inhibitor of mitochondrial lipid peroxidation. Inhibitor of inducible nitric oxide synthase (iNOS/NOS II) expression. DNA polymerase inhibitor. Shows antimicrobial and cytotoxic activity.

Calyculin A

ALX-350-014-C010	10 µg
ALX-350-014-C025	25 µg
ALX-350-014-C050	50 µg
ALX-350-014-C100	100 µg

NEW Psoralidin

ALX-350-323-M001	1 mg



Protein Phosphatase Inhibitors

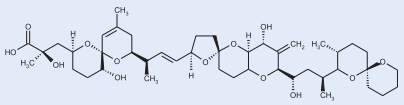
Okadaic acid (high purity)

ALX-350-003-C025	25 µg
ALX-350-003-C050	50 µg
ALX-350-003-C100	100 µg
ALX-350-003-M001	1 mg

Isolated from *Prorocentrum convacum*. Potent inhibitor of protein phosphatases 1 (PP1) and 2A (PP2A) in numerous cell types. Does not affect activity of acid phosphatases, alkaline phosphatases and tyrosine phosphatases. Non-phorbol type tumor promoter. Induces apoptosis in human breast carcinoma cells (MB-231 and MCF-7) and in myeloid cells, but inhibits glucocorticoid-induced apoptosis in T cell hybridomas. Has shown contractile effect on smooth and heart muscles.

LIT: Okadaic acid: an additional non-phorbol-12-tetradecanoate-13-acetate- type tumor promoter: M. Suganuma, et al.; PNAS 85, 1768 (1988) ▪ Protein phosphatases come of age: P. Cohen & P.T.W. Cohen; J. Biol. Chem. 264, 21435 (1989) ▪ The structure and regulation of protein phosphatases: P. Cohen; Ann. Rev. Biochem. 58, 453 (1989) ▪ Effects of the tumour promoter okadaic acid on intracellular protein phosphorylation and metabolism: T.A. Haystead, et al.; Nature 337, 78 (1989) ▪ Okadaic acid: a new probe for the study of cellular regulation: P. Cohen, et al.; TIPS 15, 98 (1990) ▪ Nonphorbol tumor promoters okadaic acid and calyculin-A induce membrane translocation of protein kinase C: R. Gopalakrishna, et al.; BBRC 189, 950 (1992)

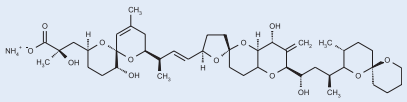
For a comprehensive bibliography please visit our website.



Salt forms of okadaic acid (Prod. No. ALX-350-003), with slightly greater stability than the free acid after it is put into stock solution (in organic solvents).

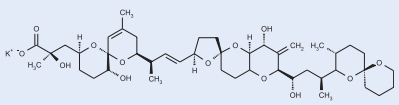
Okadaic acid . ammonium salt (high purity)

ALX-350-010-C025	25 µg
ALX-350-010-C100	100 µg
ALX-350-010-M001	1 mg



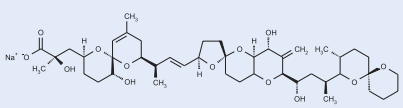
Okadaic acid . potassium salt (high purity)

ALX-350-063-C050	50 µg
ALX-350-063-C100	100 µg
ALX-350-063-M001	1 mg

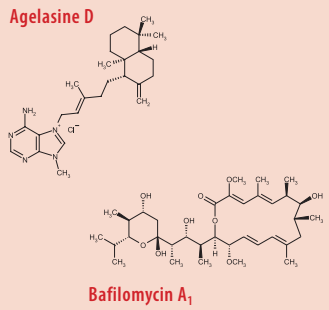


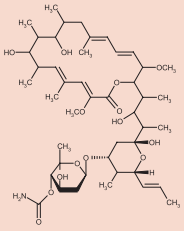
Okadaic acid . sodium salt (high purity)

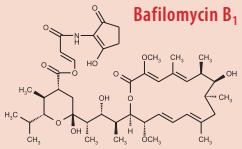
ALX-350-011-C025	25 µg
ALX-350-011-C100	100 µg
ALX-350-011-M001	1 mg

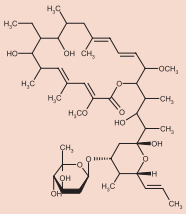


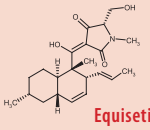
ATPase Inhibitors

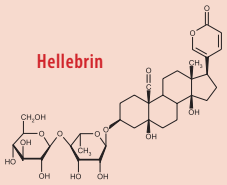


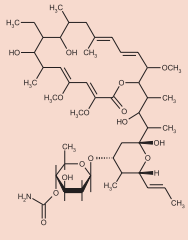


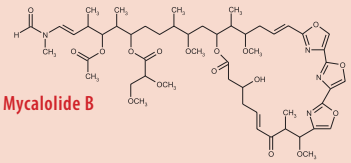












Agelasine D
ALX-350-315-M001 1 mg

Bafilomycin A_1
ALX-380-030-C100 100 µg

Bafilomycin B_1
ALX-380-063-M001 1 mg

Concanamycin A
[Folimycin]
ALX-380-034-C025 25 µg
ALX-380-034-C100 100 µg
ALX-380-034-M001 1 mg

Concanamycin B
ALX-380-098-C100 100 µg
ALX-380-098-C500 500 µg

Concanamycin C
ALX-380-099-C100 100 µg
ALX-380-099-C500 500 µg

NEW **Equisetin**
ALX-350-322-M001 1 mg

Hellebrin
[3β-(04-β-D-Glucopyranosyl-α-L-rhamnopyranosyloxy)-5,14-dihydroxy-19-oxo-5β,14-β-bufa-20,22-dienolide]
ALX-350-105-M001 1 mg
ALX-350-105-M005 5 mg

Mycalolide B
ALX-350-288-C100 100 µg

Ouabain . octahydrate
[Strophanthin G; 3-[(6-Deoxy-α-L-mannopyranosyl)oxy]-1,5,11α-14,19-penta-hydroxy-card-20(22)-enolide]
ALX-350-066-M100 100 mg

Sanguinarine chloride
[Pseudochelerythrine]
ALX-350-076-M005 5 mg

Tentoxin
[cyclo-(N-methyl-L-alanyl-L-leucyl-N-methyl-(Z)-dihydrophenylalanyl-glycyl)]
ALX-350-132-MC05 0.5 mg

Thapsigargin
ALX-350-004-M001 1 mg
ALX-350-004-M005 5 mg
ALX-350-004-M010 10 mg
ALX-350-004-M025 25 mg

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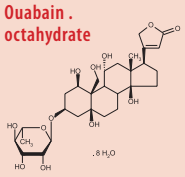
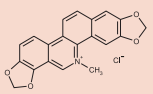
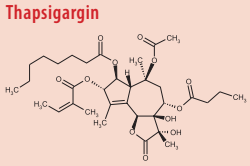
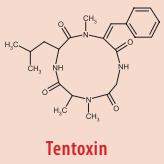








Bufadienolides

Bufadienolides are cardiotonic steroids similar to cardenolides, originally isolated from toads of the family of Bufonidae. Bufadienolides can also be found in many animals and plants [1, 2]. Bufadienolides are potent Na^+/K^+-ATPase inhibitors [3]. Most studies so far described the influence of bufadienolides in cardiac muscle performance, renal sodium excretion and blood pressure. P. Terness, et al. [4] demonstrated that bufadienolides are immunosuppressors inhibiting T cell activity with much higher potency than cortisol or cyclosporin A (Prod. No. ALX-380-002).

LIT: [1] Bufadienolides from animal and plant sources: L. Krenn & B. Kopp; Phytochemistry **48,** 1 (1998) ▪ **[2]** Bufadienolides of plant and animal origin: P.S. Steyn & F.R. van Heerden; Nat. Prod. Rep. **15,** 397 (1998) ▪ **[3]** Cardiotonic steroids: potential endogenous sodium pump ligands with diverse function: R.I. Dmitrieva & P.A. Doris; Exp. Biol. Med. **227,** 561 (2002) ▪ **[4]** The T-cell suppressive effect of bufadienolides: structural requirements for their immunoregulatory activity: P. Terness, et al.; Int. Immunopharmacol. **1,** 119 (2001)

Bufalin
[(3β,5β)-3,14-Dihydroxybufa-20,22-dienolide]
ALX-350-281-M005 5 mg

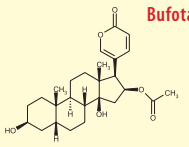
Bufotalin
ALX-350-282-M005 5 mg

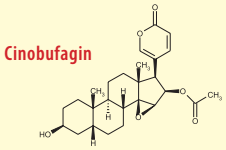
Cinobufagin
ALX-350-283-M005 5 mg

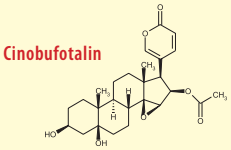
Cinobufotalin
ALX-350-284-M005 5 mg

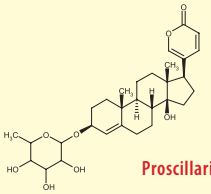
Proscillaridin A
ALX-350-285-M005 5 mg

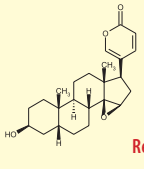
Resibufogenin
[(3β,5β,15β)-14,15-Epoxy-3-hydroxy-5-bufa-20,22-dienolide]
ALX-350-286-M010 10 mg











Active Substances from Fruits and Vegetables

NEW

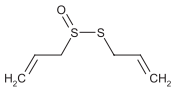
Allicin

[2-Propene-1-sulfinothioic acid S-2-propenyl ester; Diallyl thiosulfinate]

ALX-350-329-M001 1 mg
ALX-350-329-M005 5 mg

Active metabolite of garlic. Exhibits antioxidant, antiproliferative, chemopreventive, antihyperlipidaemic and antihypertensive effects.

LIT: Effect of raw garlic vs commercial garlic supplements on plasma lipid concentrations in adults with moderate hypercholesterolemia: a randomized clinical trial: C.D. Gardner, et al.; Arch. Intern. Med. **167,** 346 (2007)



Limonin

[Limonoic acid di-δ-lactone]

ALX-350-225-M050 50 mg

Isolated from grapefruit seed. Bitter principle of citrus fruits. Inhibits chemically induced carcinogenesis.

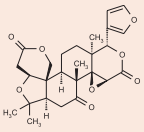
LIT: The effect of citrus limonoids on hamster buccal pouch carcinogenesis: E.G. Miller, et al.; Carcinogenesis **10,** 1535 (1989)

Nomilin

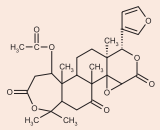
ALX-350-228-M025 25 mg

Isolated from grapefruit seed and citrus juice. Induces phase II detoxifying enzymes and inhibits chemically induced carcinogenesis.

LIT: The effect of citrus limonoids on hamster buccal pouch carcinogenesis: E.G. Miller, et al.; Carcinogenesis **10,** 1535 (1989)



Limonin



Nomilin

Products isolated from the unsaponifiable fraction of petroleum ether extract of coffee beans. Inducers of glutathione S-transferases.

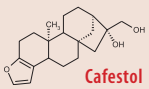
LIT: Isolation and identification of kahweol palmitate and cafestol palmitate as active constituents of green coffee beans that enhance glutathione S-transferase activity in the mouse: L.K. Lam, et al.; Cancer Res. **42,** 1193 (1982)

Cafestol

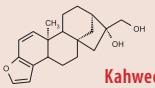
ALX-350-220-M050 50 mg

Kahweol

ALX-350-223-M010 10 mg



Cafestol



Kahweol

Resveratrol

[*trans*-3,4′,5-Trihydroxystilbene]

ALX-270-125-M050 50 mg
ALX-270-125-M100 100 mg
ALX-270-125-M250 250 mg

Originally isolated from grapes. Shows cancer chemopreventive activity. Specific inhibitor of cyclooxygenase-1 (COX-1). Inhibits the hydroperoxidase activity of COX-1. Antioxidant. Potent activator of human deacetylase SIRT1. Protects against 4-hydroxynonenal (4-HNE) induced oxidative stress and apoptosis in Swiss 3T3 fibroblasts.

LIT: Cancer chemopreventive activity of resveratrol, a natural product derived from grapes: M. Jang, et al.; Science **275,** 218 (1997) ▪ Small molecule activators of sirtuins extend Saccharomyces cerevisiae lifespan: K.T. Howitz, et al.; Nature **425,** 191 (2003) ▪ Resveratrol protects against 4-HNE induced oxidative stress and apoptosis in Swiss 3T3 fibroblasts: O. Kutuk, et al.; Biofactors **20,** 1 (2004)

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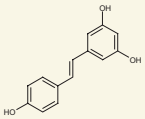


L-Sulforaphane

[R-Sulforaphane]

ALX-350-230-M010 10 mg

Chiral natural product isolated from broccoli. Potent, selective inducer of phase II detoxification enzymes. Inhibits chemically induced mammary tumor formation in rats.

LIT: A major inducer of anticarcinogenic protective enzymes from broccoli: isolation and elucidation of structure: Y. Zhang, et al.; PNAS **89,** 2399 (1992) ▪ Sulforaphane inhibits extracellular, intracellular, and antibiotic-resistant strains of Helicobacter pylori and prevents benzo[a]pyrene-induced stomach tumors: J.W. Fahey, et al.; PNAS **99,** 7610 (2002)

L-Sulforaphene

[S-Sulforaphene; Raphanin]

ALX-350-231-M010 10 mg

Chiral natural product isolated from radish seeds (*Raphanus sativus L.*) and broccoli. May protect from stomach ulcers induced by *Helicobacter pylori*.

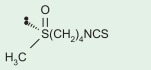
DL-Sulforaphane

[R,S-Sulforaphane]

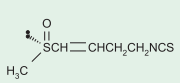
ALX-350-232-M025 25 mg

Synthetic. Potent, selective inducer of phase II detoxification enzymes. Inhibits chemically induced mammary tumor formation in rats.

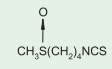
LIT: A major inducer of anticarcinogenic protective enzymes from broccoli: isolation and elucidation of structure: Y. Zhang, et al.; PNAS **89,** 2399 (1992)



L-Sulforaphane



L-Sulforaphene



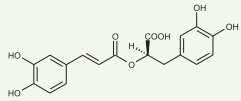
DL-Sulforaphane

Rosmarinic acid

ALX-270-253-M010 10 mg
ALX-270-253-M050 50 mg

Isolated from *Rosmarinus officinalis*. Naturally occurring polyphenolic compound with antioxidant and anti-inflammatory properties. Inhibitor of lipid peroxidation, TCR-induced T cell activation and proliferation.

LIT: Rosmarinic acid inhibits TCR-induced T cell activation and proliferation in an Lck-dependent manner: J. Won, et al.; Eur. J. Immunol. **33,** 870 (2003)



Latest Additions – Rare Antibiotics

Antitumor Agents

NEW Anguinomycin A
ALX-380-202-MC01 0.1 mg

Isolated from *Streptomyces* sp. Antitumor agent. Analog of leptomycin B, an inhibitor of nuclear export of proteins.

LIT: New antitumor antibiotics, anguinomycins A and B: Y. Hayakawa, et al.; J. Antibiot. (Tokyo) **40,** 1349 (1987) ▪ Anguinomycins C and D, new antitumor antibiotics with selective cytotoxicity against transformed cells: Y. Hayakawa, et al.; J. Antibiot. (Tokyo) **48,** 954 (1995)

NEW Ansatrienin A
[Mycotrienin I]

ALX-380-203-M001 1 mg

Isolated from *Streptomyces* sp. Closely related to cytotrienins. Displays potent anti-tumor activities. Inhibits osteoclastic bone resorption. Significantly potentiates the action of several clinical anti-tumor agents.

LIT: Mycotrienin, a new polyene antibiotic isolated from Streptomyces: C. Coronelli, et al.; J. Antibiot. (Tokyo) **20,** 329 (1967) ▪ Mycotrienins. A new class of potent inhibitors of osteoclastic bone resorption: D. Feuerbach, et al.; J. Biol. Chem. **270,** 25949 (1995)

NEW Ansatrienin B
[Mycotrienin II]

ALX-380-204-M001 1 mg

Isolated from a *Streptomyces* sp. Closely related to the cytotrienins. Displays potent anti-cancer activities. Inhibits osteoclastic bone resorption. Significantly potentiates the action of several clinical anti-cancer agents.

LIT: See ALX-380-203.

NEW Hexacyclinic acid
ALX-380-123-M001 1 mg
ALX-380-123-M005 5 mg

Isolated from *Streptomyces cellulosae ssp. griseorubinosus.* Antitumor antibiotic. Displays weak cytotoxicity against different tumor cell lines.

LIT: Hexacyclinic acid, a Polyketide from Streptomyces with a Novel Carbon Skeleton: R. Hofs, et al.; Angew. Chem. Int. Ed. Engl. **39,** 3258 (2000)

NEW Kigamicin C
ALX-380-213-MC05 0.5 mg

Isolated from *Amycolatopsis* sp. Anti-tumor agent. Selectively killed PANC-1 cells under nutrient starved conditions via blocking of the activation of PKB/Akt. Inhibits growth of Gram-positive bacteria including MRSA.

LIT: Kigamicins, novel antitumor antibiotics. I. Taxonomy, isolation, physico-chemical properties and biological activities: S. Kunimoto, et al.; J. Antibiot. (Tokyo) **56,** 1004 (2003) ▪ Kigamicins, novel antitumor antibiotics. II. Structure determination: S. Kunimoto, et al.; J. Antibiot. (Tokyo) **56,** 1012 (2003)

Angiogenesis Inhibitors

Asterric acid
ALX-380-208-M001 1 mg

Isolated from *Aspergillus terreus.* Inhibitor of vascular endothelial growth factor (VEGF). Angiogenesis inhibitor acting on VEGF-induced tube formation of human umbilical vein endothelial cells.

LIT: Fungal metabolites, asterric acid derivatives inhibit vascular endothelial growth factor (VEGF)-induced tube formation of HUVECs: H.J. Lee, et al.; J. Antibiot. (Tokyo) **55,** 552 (2002)

NEW Sulochrin
ALX-380-221-M001 1 mg

Isolated from a number of *Aspergillus* and *Penicillium* sp. Inhibitor of vascular endothelial growth factor (VEGF). Antiangiogenic agent. Inhibits eosinophil activation and chemotaxis.

LIT: Studies in the biochemistry of micro-organisms. 115. Metabolites of Penicillium frequentans Westling: isolation of sulochrin, asterric acid, (+)-bisdechlorogeodin and two new substituted anthraquinones, questin and questinol: A. Mahmoodian and C.E. Stickings; Biochem. J. **92,** 369 (1964) ▪ Fungal metabolites, asterric acid derivatives inhibit vascular endothelial growth factor (VEGF)-induced tube formation of HUVECs: H.J. Lee, et al.; J. Antibiot. (Tokyo) **55,** 552 (2002)

Thiolutin
[Farcinicin; Propiopyvothine]

ALX-380-200-M001 1 mg
ALX-380-200-M005 5 mg

Isolated from *Streptomyces luteosporeus.* Sulfur-containing antibiotic. Potent inhibitor of bacterial and yeast RNA polymerases. Inhibits mRNA chain elongation. Inhibits adhesion of human umbilical vein endothelial cells (HUVECs) to vitronectin (IC_{50} = 0.83µM) and thus suppresses tumor cell-induced angiogenesis *in vivo.*

LIT: Inhibition of yeast ribonucleic acid polymerases by thiolutin: D.J. Tipper; J. Bacteriol. **116,** 245 (1973) ▪ Thiolutin, an inhibitor of HUVEC adhesion to vitronectin, reduces paxillin in HUVECs and suppresses tumor cell-induced angiogenesis: K. Minamiguchi, et al.; Int. J. Cancer **93,** 307 (2001)

Potent and Selective Apoptosis Inducer

NEW Apoptolidin
ALX-380-207-MC01 0.1 mg

Isolated from *Amycolatopsis* sp. Potent and highly selective apoptosis inducer in several cancer cell lines. F_0F_1-ATPase inhibitor.

LIT: Apoptolidin, a new apoptosis inducer in transformed cells from Nocardiopsis sp: J.W. Kim, et al.; J. Antibiot. (Tokyo) **50,** 6628 (1997) ▪ Apoptolidin, a selective cytotoxic agent, is an inhibitor of F0F1-ATPase: A.R. Salomon, et al.; Chem. Biol. **8,** 71 (2001)

EGF Inhibitors

NEW Reveromycin A
ALX-380-216-MC25 0.25 mg

Isolated from *Streptomyces* sp. Inhibitor of mitogenic activity of epidermal growth factor (EGF). G1 phase cell cycle inhibitor, selectively inhibiting isoleucyl-tRNA synthetase. Displays anti-proliferative as well as potent antifungal activity. Induces apoptosis in osteoclasts thus inhibiting bone resorption.

LIT: Chemical modification of reveromycin A and its biological activities: T. Shimizu, et al.; Bioorg. Med. Chem. Lett. **12,** 3363 (2002) ▪ Identification of Saccharomyces cerevisiae isoleucyl-tRNA synthetase as a target of the G1-specific inhibitor Reveromycin A: Y. Miyamoto, et al.; J. Biol. Chem. **277,** 28810 (2002) ▪ Reveromycin A inhibits osteolytic bone metastasis of small-cell lung cancer cells, SBC-5, through an antiosteoclastic activity: H. Muguruma, et al.; Clin. Cancer Res. **11,** 8822 (2005) ▪ Reveromycin A, an agent for osteoporosis, inhibits bone resorption by inducing apoptosis specifically in osteoclasts: J.T. Woo, et al.; PNAS **103,** 4729 (2006) ▪ Molecular pathogenesis and its therapeutic modalities of lung cancer metastasis to bone: S. Sone and S. Yano; Cancer Metastasis Rev. **in press,** (2007) ▪ Regulation of osteoclast polarization: N. Takahashi, et al.; Odontology **95,** 1 (2007) (Review)

NEW Reveromycin B
ALX-380-217-MC25 0.25 mg

Isolated from *Streptomyces* sp. Much less active analog of reveromycin A. Useful negative control in resolving the mode of action of this class.

LIT: Reveromycins, new inhibitors of eukaryotic cell growth. I. Producing organism, fermentation, isolation and physico-chemical properties: H. Takahashi, et al.; J. Antibiot. (Tokyo) **45,** 1409 (1992) ▪ Reveromycins, new inhibitors of eukaryotic cell growth. II. Biological activities: H. Takahashi, et al.; J. Antibiot. (Tokyo) **45,** 1414 (1992)

NEW Reveromycin C
ALX-380-218-MC25 0.25 mg

Isolated from *Streptomyces* sp. Has similar biological profiles and exhibits comparable potency to reveromycin A. Generally more potent.

LIT: See ALX-380-217.

NEW Reveromycin D
ALX-380-219-MC25 0.25 mg

Isolated from *Streptomyces* sp. More active than reveromycin C.

LIT: See ALX-380-217.

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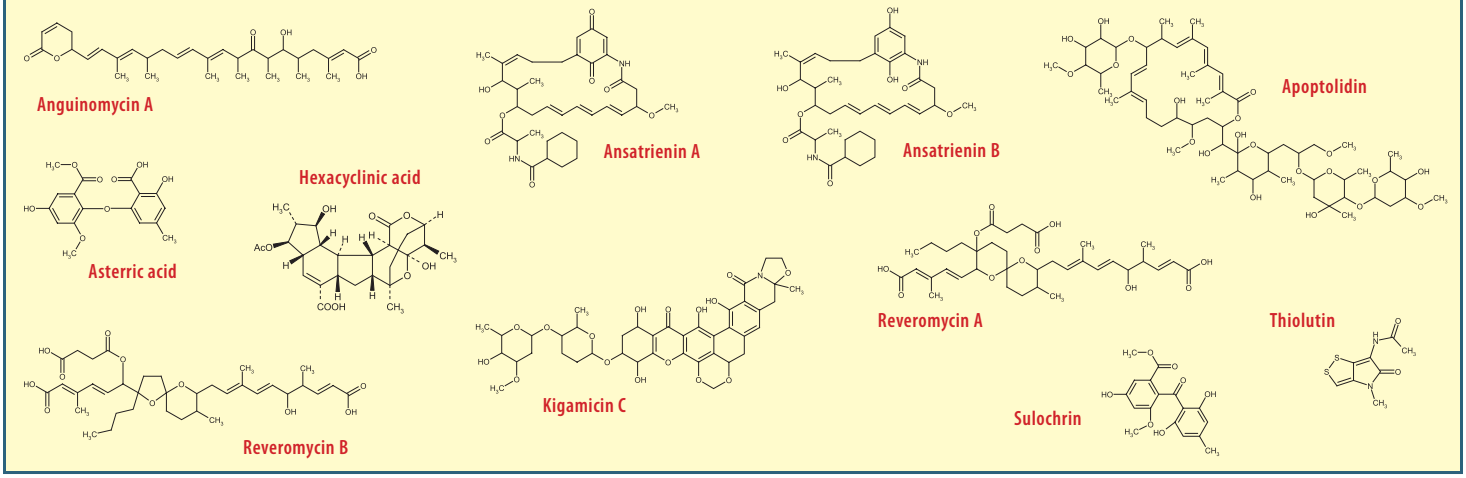


Latest Additions – Rare Antibiotics

Potent HIF-1 Inhibitor

NEW Echinomycin
[Quinomycin A; Actinoleukin]

ALX-380-201-M001 1 mg
ALX-380-201-M005 5 mg

Isolated from *Streptomyces* sp. Powerful, selective inhibitor of nucleic acid synthesis *in vitro.* Potent inhibitor of hypoxia-inducible factor 1 (HIF-1) DNA binding activity. Induces apoptosis. Antitumor agent. Displays antibacterial, antifungal and antiviral activities.

LIT: The mode of action of quinoxaline antibiotics. Interaction of quinomycin A with deoxyribonucleic acid: K. Sato, et al.; J. Antibiot. **20,** 270 (1967) ▪ Echinomycin inhibits chromosomal DNA replication and embryonic development in vertebrates: L.G. May, et al.; Nucl. Acids Res. **32,** 65 (2004) ▪ Echinomycin and a novel analogue induce apoptosis of HT-29 cells via the activation of MAP kinases pathway: J.Y. Park, et al.; Pharmacol. Res. **50,** 201 (2004) ▪ Echinomycin, a small-molecule inhibitor of hypoxia-inducible factor-1 DNA-binding activity: D. Kong, et al.; Cancer Res. **65,** 9047 (2005) ▪ Molecular signaling cascade in DNA bisintercalator, echinomycin-induced apoptosis of HT-29 cells: evidence of the apoptotic process via activation of the cytochrome c-ERK-caspase-3 pathway: J.Y. Park, et al.; Int. J. Biochem. Cell Biol. **38,** 244 (2006)

Find more details in our catalog "Hypoxia & HIF-1". Request your free copy at www.axxora.com

Inhibitor of T Cell Proliferation

NEW Monactin

ALX-380-214-M001 1 mg

Isolated from *Streptomyces* sp. Ionophorous agent. Inhibits T cell proliferation induced by IL-2 and cytokine production at nanomolar levels for IL-2, IL- 4, IL-5 and interferon-γ.

LIT: The in Vitro Activity of Nonactin and Its Homologs: Monactin, Dinactin and Trinactin: E. Meyers, et al.; J. Antibiot. (Tokyo) **18,** 128 (1965) ▪ Effects of cyclosporin A and dinactin on T-cell proliferation, interleukin-5 production, and murine pulmonary inflammation: S.P. Umland, et al.; Am. J. Respir. Cell. Mol. Biol. **20,** 481 (1999)

V-ATPase Inhibitor

Bafilomycin C_1

ALX-380-209-M001 1 mg

Isolated from *Streptomyces* sp. Inhibits vacuolar ATPase (V-ATPase). Macrolide antibiotic that acts as a specific inhibitor of vacuolar-type H^+-ATPase. Shows antibacterial, antifungal, insecticidal and antihelmintic activity. Potential anti-osteoporotic agent in treating bone lytic diseases. See our website for Bafilomycin A_1 (ALX-380-030) and Bafilomycin B_1 (ALX-380-063).

P-ATPase Inhibitor

NEW Elaiophylin

ALX-380-212-M001 1 mg

Isolated from *Streptomyces hygroscopicus.* Inhibitor of the plasma-proton ATPase (P-ATPase). Inhibits testosterone 5-reductase. Shows antifungal, antiprotozoal, antitumor, antihelmintic and immunosuppressive activity.

LIT: Melanosporin and elaiophylin, new antibiotics from Streptomyces malanosporus (sive melanosporofaciens) n. sp.: F.M. Arcamone, et al.; G. Microbiol. **7,** 207 (1959) ▪ Cation selective ion channels formed by macrodiolide antibiotic elaiophylin in lipid bilayer membranes: P.A. Grigoriev, et al.; Bioelectrochemistry **54,** 11 (2001)

PTPase Inhibitor

NEW Antibiotic RK-682

ALX-380-205-MC05 0.5 mg

Isolated from *Streptomyces* sp. Inhibits protein tyrosine phosphatases (PTPase) and heparanase. Potent activity against HIV-1 protease.

LIT: 3-Alkanoyl-5-hydroxymethyl tetronic acid homologues and resistomycin: new inhibitors of HIV-1 protease. I. Fermentation, isolation and biological activity: B.E. Roggo, et al.; J. Antibiot. (Tokyo) **47,** 136 (1994) ▪ RK-682, a potent inhibitor of tyrosine phosphatase, arrested the mammalian cell cycle progression at G1phase: T. Hamaguchi, et al.; FEBS Lett. **372,** 54 (1995)

Selective Cholinergic Antagonist

NEW Paraherquamide A

ALX-380-215-M001 1 mg

Isolated from *Penicillium simplicissimum.* Selective and competitive cholinergic antagonist that distinguishes subtypes of cholinergic receptors. Anti-helmintic.

LIT: Novel antinematodal and antiparasitic agents from Penicillium charlesii. I. Fermentation, isolation and biological activity: J.G. Ondeyka, et al.; J. Antibiot. (Tokyo) **43,** 1375 (1990) ▪ Anthelmintic paraherquamides are cholinergic antagonists in gastrointestinal nematodes and mammals: E.W. Zinser, et al.; J. Vet. Pharmacol. Ther. **25,** 241 (2002)

Others

NEW Atpenin A5

ALX-380-108-C250 250 µg

Produced by *Penicillium* sp. Potent and specific inhibitor of mitochondrial complex II (succinate-ubiquinone oxidoreductase).

Fungal strain courtesy of the Kitasato Institute, Tokyo.

LIT: Atpenins, new antifungal antibiotics produced by Penicillium sp. Production, isolation, physico-chemical and biological properties: S. Omura, et al.; J. Antibiot. **41,** 1769 (1988) ▪ Atpenins, potent and specific inhibitors of mitochondrial complex II (succinate-ubiquinone oxidoreductase): H. Miyadera, et al.; PNAS **100,** 473 (2003)

Borrelidin

ALX-380-102-MC05 0.5 mg
ALX-380-102-M001 1 mg

Isolated from *Streptomyces* sp. Inhibitor of bacterial and eukaryal threonyl-tRNA synthetase (ThrRS). Inhibitor of cyclin-dependent kinase (CDK). Shows anti-angiogenic inhibiting and antiviral activity.

LIT: Genetic analysis of mutations causing borrelidin resistance by overproduction of threonyl-transfer ribonucleic acid synthetase: J. Frohler, et al.; J. Bacteriol. **143,** 1135 (1980) ▪ Borrelidin inhibits a cyclin-dependent kinase (CDK), Cdc28/Cln2, of Saccharomyces cerevisiae: E. Tsuchiya, et al.; J. Antibiot. **54,** 84 (2001) ▪ A unique hydrophobic cluster near the active site contributes to differences in borrelidin inhibition among threonyl-tRNA synthetases: B. Ruan, et al.; J. Biol. Chem. **280,** 571 (2005)

NEW Steffimycin B

ALX-380-220-M001 1 mg

Isolated from a *Streptomyces* sp. DNA-binding agent. Displays anti-bacterial and anti-neoplastic properties. Potential anti-tumor agent.

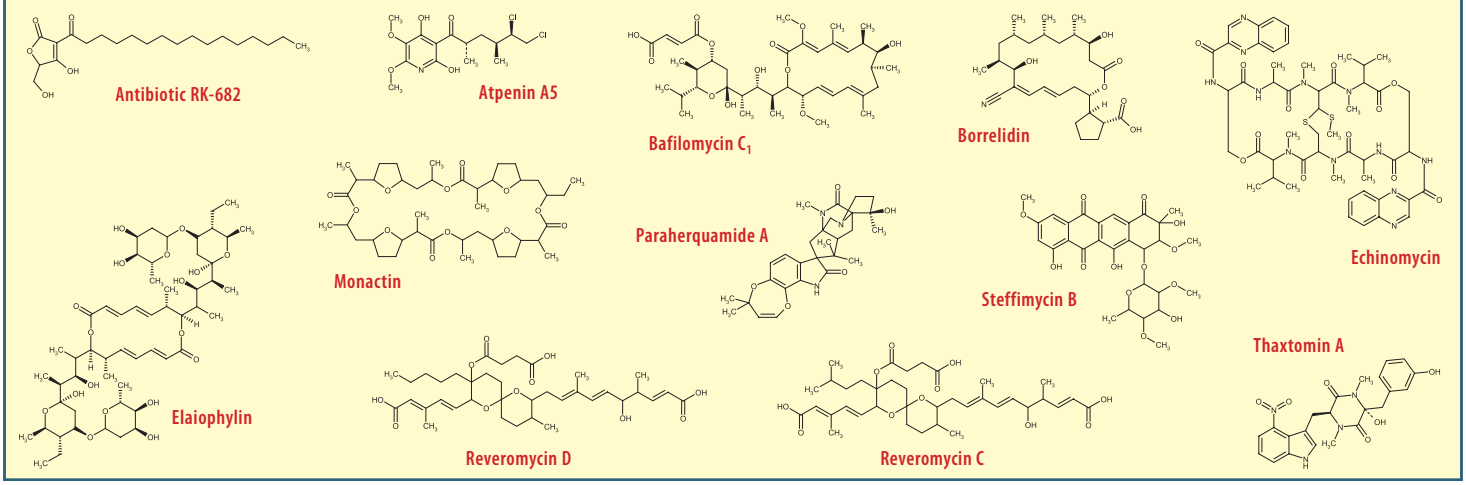
LIT: Steffimycin B, a new member of the steffimycin family: isolation and characterization: T.F. Brodasky and F. Reusser; J. Antibiot. (Tokyo) **27,** 809 (1974) ▪ Steffimycin B, a DNA binding agent: F. Reusser; Biochim. Biophys. Acta **383,** 266 (1975) ▪ Molecular structure of antitumor drug steffimycin and modelling of its binding to DNA: M. Sriram, et al.; J. Biomol. Struct. Dyn. **9,** 251 (1991)

NEW Thaxtomin A
[Thaxtomin A]

ALX-630-109-M001 1 mg
ALX-630-109-M005 5 mg

Isolated from *Streptomyces* sp. Phytotoxin. Causes plant cell necrosis at nanomolar concentrations. Demonstrated to be produced by bacterial nitric oxide synthases (NOS).

LIT: Selection and characterization of microorganisms utilizing thaxtomin A, a phytotoxin produced by streptomyces scabies: C.L. Doumbou, et al.; Appl. Environ. Microbiol. **64,** 4313 (1998) ▪ Nitration of a peptide phytotoxin by bacterial nitric oxide synthase: J.A. Kers, et al.; Nature **429,** 79 (2004) ▪ Thaxtomin A induces programmed cell death in Arabidopsis thaliana suspension-cultured cells: I. Duval, et al.; Planta **222,** 820 (2005)



Latest Additions – Natural Products

Antitumor & Chemopreventive Compounds

NEW Agelasine D

ALX-350-315-M001 1 mg

Isolated from sponge *Agelas nakamurai*. Displays broad spectrum of antibacterial activities. Antineoplastic compound, inhibiting several cancer cell lines. Associated with contractive responses of smooth muscles and inhibition of Na/K-ATPase.

LIT: (+)-agelasine D: improved synthesis and evaluation of antibacterial and cytotoxic activities: A. Vik, et al.; J. Nat. Prod. **69,** 381 (2006)

NEW Ascochlorin

[Antibiotic LL-Z 1272 γ]

ALX-350-334-MC05 0.5 mg

Isolated from *Acremonium* sp. Antitumor compound. Shows antiviral activity. Inhibits matrix metalloproteinase 9 (MMP-9). Reduces the inflammatory response to TNF-α in rat vascular smooth muscle cells. May be useful as an antiatherogenic agent.

LIT: Ascochlorin, a new antibiotic, found by the paper-disc agar-diffusion method. I. Isolation, biological and chemical properties of ascochlorin. (Studies on antiviral and antitumor antibiotics. I): G. Tamura, et al.; J. Antibiot. (Tokyo) **21,** 539 (1968) ▪ Ascochlorin inhibits matrix metalloproteinase-9 expression by suppressing activator protein-1-mediated gene expression through the ERK1/2 signaling pathway: inhibitory effects of ascochlorin on the invasion of renal carcinoma cells: S. Hong, et al.; J. Biol. Chem. **280,** 25202 (2005)

NEW Cochliodinol

ALX-350-316-MC05 0.5 mg

Isolated from *Chaetomium globosum*. Antibiotic, displaying antibacterial and anti-tumor activity.

LIT: The toxicity of cochliodinol, an antibiotic metabolite of Chaetomium spp: D. Brewer, et al.; Can. J. Microbiol. **16,** 433 (1970)

NEW Odorine

ALX-350-304-MC05 0.5 mg

Isolated from *Aglaia odorata*. Cancer chemopreventive agent. Inhibits both the initiation and promotion stages of two-stage skin carcinogenesis.

LIT: Cancer chemopreventive activity of odorine and odorinol from Aglaia odorata: A. Inada, et al.; Biol. Pharm. Bull. **24,** 1282 (2001)

NEW Odorinol

ALX-350-306-MC05 0.5 mg

Isolated from *Aglaia odorata*. Cancer chemopreventive agent. Inhibits both the initiation and promotion stages of two-stage skin carcinogenesis.

LIT: Cancer chemopreventive activity of odorine and odorinol from Aglaia odorata: A. Inada, et al.; Biol. Pharm. Bull. **24,** 1282 (2001)

NEW Ophiobolin A

ALX-270-109-M001 1 mg

Isolated from *Helminthosporium* sp. Cell permeable antagonist of calmodulin. Inhibits Ca^{2+}/calmodulin-dependent phosphodiesterase. Inhibits P-glycoprotein-mediated transport. Exhibits antibacterial, antitumor and nematocidal activities. Phytotoxic.

LIT: The structure of ophiobolin, a C25 terpenoid having a novel skeleton: S. Nozoe, et al.; JACS **87,** 4968 (1965) ▪ Ophiobolin A. A natural product inhibitor of calmodulin: P.C. Leung, et al.; J. Biol. Chem. **259,** 2742 (1984) ▪ The biology of ophiobolins: T.K. Au, et al.; Life Sci. **67,** 733 (2000) (Review)

NEW Ophiobolin B

ALX-350-338-M001 1 mg

Isolated from *Bipolaris leersia* MST-FP107. Originally isolated from *Helminthosporium* sp. Inhibitor of calmodulin action in calcium regulation. Exhibits antibacterial, antitumor and nematocidal activities.

LIT: The structure of ophiobolin, a C25 terpenoid having a novel skeleton: S. Nozoe, et al.; JACS **87,** 4968 (1965) ▪ Microbial metabolites of ophiobolin A and antimicrobial evaluation of ophiobolins: E. Li, et al.; J. Nat. Prod. **58,** 74 (1995) ▪ The biology of ophiobolins: T.K. Au, et al.; Life Sci. **67,** 733 (2000) (Review)

NEW Tenuazonic acid

ALX-350-317-MC05 0.5 mg

Isolated from *Alternaria* sp. Antineoplastic compound exhibiting antitumor, antiviral and antibacterial activity. Inhibits protein synthesis by suppression at the ribosome and may act as a mycotoxin.

LIT: Studies in the biochemistry of micro-organisms. 106. Metabolites of Alternaria tenuis auct.: the structure of tenuazonic acid: C.E. Stickings; Biochem. J. **72,** 332 (1959) ▪ Antiviral Activity of Tenuazonic Acid: F.A. Miller, et al.; Nature **200,** 1338 (1963) ▪ Antitumor, cytotoxic, and antibacterial activities of tenuazonic acid and congeneric tetramic acids: C.O. Gitterman; J. Med. Chem. **8,** 483 (1965) ▪ Inhibition of mouse skin tumor promotion by tenuazonic acid: M. Antony, et al.; Cancer Lett. **61,** 21 (1991)

Anti-inflammatory Compounds

Angoroside C

[Isoangoroside C]

ALX-350-331-M001 1 mg
ALX-350-331-M005 5 mg

Isolated from the root of *Scrophularia ningpoensis Hemsl* (Figwort). Potential anti-inflammatory compound. Inhibitor of prostaglandin E_2 release in mouse peritoneal macrophages *in vitro*. Shows potent antioxidative activity in reducing the oxidized OH adducts of dAMP and dGMP.

LIT: Fast repairing of oxidized OH radical adducts of dAMP and dGMP by phenylpropanoid glycosides from Scrophularia ningpoensis Hemsl: Y.M. Li, et al.; Acta Pharmacol. Sin. **21,** 1125 (2000) ▪ Phenylpropanoid glycosides from Scrophularia scorodonia: in vitro anti-inflammatory activity: A.M. Diaz, et al.; Life Sci. **74,** 2515 (2004)

Celastrol

[Tripterine; 3-Hydroxy-24-nor-2-oxo-1(10),3,5,7-friedelatetraen-29-oic acid]

ALX-350-332-M005 5 mg
ALX-350-332-M025 25 mg

Isolated from the root of *Tripterygium* sp. Cell permeable triterpenoid anti-inflammatory and immunosuppressive compound. Shows antioxidant activity in rat liver assay of lipid peroxidation *in vivo*. Suppresses LPS-induced cytokine release in macrophages and monocytes. Suppresses NO production and LPS-induced NF-κB activation.

LIT: The triterpene celastrol as a very potent inhibitor of lipid peroxidation in mitochondria: H. Sassa, et al.; BBRC **172,** 890 (1990) ▪ Celastrol, a potent antioxidant and anti-inflammatory drug, as a possible treatment for Alzheimer's disease: A.C. Allison, et al.; Prog. Neuropsychopharmacol. Biol. Psychiatry **25,** 1341 (2001) ▪ Antiinflammatory constituents of Celastrus orbiculatus inhibit the NF-kappaB activation and NO production: H.Z. Jin, et al.; J. Nat. Prod. **65,** 89 (2002) ▪ Celastrol blocks neuronal cell death and extends life in transgenic mouse model of amyotrophic lateral sclerosis: M. Kiaei, et al.; Neurodegener. Dis. **2,** 246 (2005) ▪ Celastrol, a novel triterpene, potentiates TNF-induced apoptosis and suppresses invasion of tumor cells by inhibiting NF-kappaB-regulated gene products and TAK1-mediated NF-kappaB activation: G. Sethi, et al.; Blood **109,** 2727 (2007)

Harpagoside

ALX-350-333-M005 5 mg
ALX-350-333-M025 25 mg

Isolated from *Scrophularia ningpoensis Hemsl* (Figwort). Anti-inflammatory and anti-diabetic compound. Suppresses LPS-induced iNOS (NOS II) and COX-2 expression through inhibition of NF-κB activation.

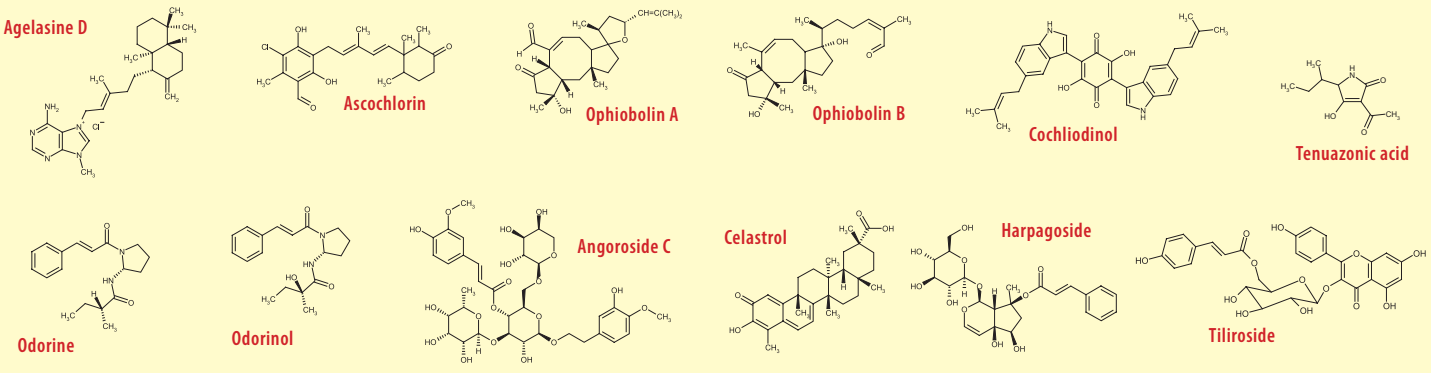
LIT: Antiinflammatory effects of different extracts and harpagoside isolated from Scrophularia frutescens: L. D. Garcia, et al.; Farmaco. **51,** 443 (1996) ▪ Scropolioside-D2 and harpagoside-B: two new iridoid glycosides from Scrophularia deserti and their antidiabetic and antiinflammatory activity: B. Ahmed, et al.; Biol. Pharm. Bull. **26,** 462 (2003) ▪ Harpagoside suppresses lipopolysaccharide-induced iNOS and COX-2 expression through inhibition of NF-kappa B activation: T.H. Huang, et al.; J. Ethnopharmacol. **104,** 149 (2006)

Tiliroside

ALX-350-305-M001 1 mg

Isolated from *Tilia* sp. Flavonoid which shows anti-complement, anti-inflammatory and free radical scavenger activity. Inhibits the production of the inflammatory mediators NO, TNF-α and IL-12 in activated macrophages. Potent activity against d-GalN-induced cytotoxicity in hepatocytes. Cytotoxic against specific leukaemic cell lines.

LIT: Anti-complement activity of tiliroside from the flower buds of Magnolia fargesii: K.Y. Jung, et al.; Biol. Pharm. Bull. **21,** 1077 (1998) ▪ Cytotoxic and antiproliferative effects of heptaacetyltiliroside on human leukemic cell lines: K. Dimas, et al.; Leuk. Res. **23,** 1021 (1999) ▪ Assessment of the anti-inflammatory activity and free radical scavenger activity of tiliroside: A. Sala, et al.; Eur. J. Pharmacol. **461,** 53 (2003) ▪ Inhibitory effects of the flavonoids isolated from Waltheria indica on the production of NO, TNF-alpha and IL-12 in activated macrophages: Y.K. Rao, et al.; Biol. Pharm. Bull. **28,** 912 (2005)



Latest Additions – Natural Products

Inhibitors of IL-6 Signalling

Galiellalactone

ALX-350-336-MC05 0.5 mg

Originally isolated from *Galiella rufa* as a plant growth regulator. Inhibits IL-6 mediated signal transduction by blocking the binding of the activated STAT3 dimers to their DNA binding sites without inhibiting the tyrosine and serine phosphorylation of the STAT3 transcription factor.

LIT: Screening of basidiomycetes and ascomycetes for plant regulating substances: R. Hautzel & H. Anke; Z. Naturforsch. **45c,** 1094 (1990) ▪ Inhibition of interleukin-6 signaling by galiellalactone: M. Weidler, et al.; FEBS Lett. **484,** 1 (2000)

NEW (+)-Madindoline A

ALX-350-328-MC05 0.5 mg
ALX-350-328-M001 1 mg

Synthetic. Madindolines are noncytotoxic indole alkaloids originally isolated from a fermentation broth of *Streptomyces nitrosporeus* K93-0711. Madindoline A is a potent inhibitor of interleukin-6 [IL-6].

LIT: Madindoline, a novel inhibitor of IL-6 activity from Streptomyces sp. K93-0711. I. Taxonomy, fermentation, isolation and biological activities: M. Hayashi, et al.; J. Antibiot. **49,** 1091 (1996) ▪ Madindolines, novel inhibitors of IL-6 activity from streptomyces sp. K93-0711. II. Physico-chemical properties and structural elucidation: S.Takamatsu, et. al.; J. Antibiot. **50,** 1069 (1997) ▪ Binding of madindoline A to the extracellular domain of gp130: A.Z. Saleh, et al.; Biochemistry **44,** 10822 (2005)

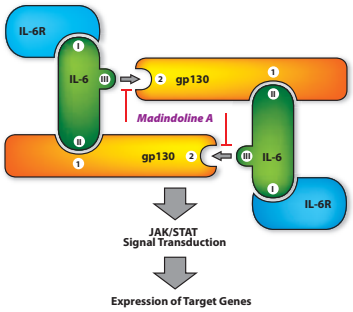


FIGURE: Madindoline A inhibits homodimerization of the two trimeric IL-6 / IL-6R / gp130 complexes by binding to site 2 of gp130.

CCR5 Antagonist - Blocking HIV

NEW Cochlioquinone A

[Luteoleersin]

ALX-350-335-MC05 0.5 mg

Isolated from *Bipolaris leersia.* Shows anti-angiogenic and nematocidal activities. Antagonist of the human chemokine receptor CCR5 in human immunodeficiency virus type 1 (HIV-1). Inhibitor of diacylglycerol acyltransferase, diacylglycerol kinase and NADH-ubiquinone reductase.

LIT: Cochlioquinone A, a nematocidal agent which competes for specific [3H]ivermectin binding sites: J.M. Schaeffer, et al.; J. Antibiot. (Tokyo) **43,** 1179 (1990) ▪ Inhibitory activity of diacylglycerol acyltransferase by cochlioquinones A and A1: H.B. Lee, et al.; J. Antibiot. (Tokyo) **56,** 967 (2003) ▪ Cochlioquinones and epi-cochlioquinones: antagonists of the human chemokine receptor CCR5 from Bipolaris brizae and Stachybotrys chartarum: K. Yoganathan, et al.; J. Antibiot. (Tokyo) **57,** 59 (2004)

NEW Cochlioquinone B

ALX-350-341-MC05 0.5 mg

Isolated from *Bipolaris leersia.* Antagonist of the human chemokine receptor CCR5 in human immunodeficiency virus type 1 (HIV-1). Inhibitor of NADH-ubiquinone reductase. Phytotoxic agent inhibiting root growth.

LIT: See ALX-350-335.

Glucose-6-phosphatase Inhibitors

NEW Thielavin A

ALX-350-339-MC05 0.5 mg

Fungal metabolite. Glucose-6-phosphatase inhibitor. Inhibitor of prostaglandin biosynthesis.

LIT: Thielavin A and B, new inhibitors of prostaglandin biosynthesis produced by Thielavia terricola: N. Kitahara, et al.; J. Antibiot. (Tokyo) **34,** 1562 (1981) ▪ Thielavins as glucose-6-phosphatase (G6Pase) inhibitors: producing strain, fermentation, isolation, structural elucidation and biological activitie: S. Sakemi, et al.; J. Antibiot. (Tokyo) **55,** 941 (2002)

NEW Thielavin B

ALX-350-340-MC05 0.5 mg

Fungal metabolite. Glucose-6-phosphatase inhibitor. Potent inhibitor of phospholipase C. Inhibits telomerase, viral reverse transcriptase, peptidoglycan formation and prostaglandin biosynthesis.

LIT: See ALX-350-339.

Neurotoxins

NEW Roquefortine C

[Roquefortine]

ALX-350-342-MC05 0.5 mg

Potent neurotoxin produced by a diverse range of fungi, most notably *Penicillium* species. Inhibits growth of Gram-positive bacteria. Inhibits cytochrome p450.

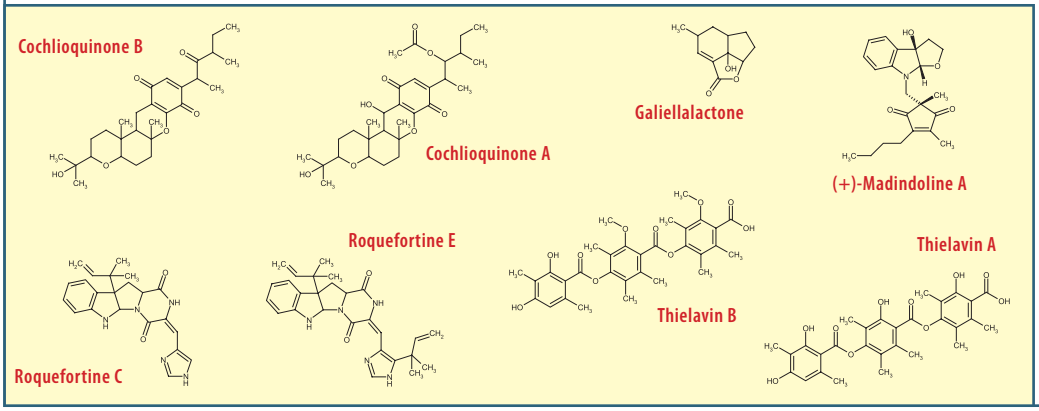
LIT: Isolation of festuclavine and three new indole alkaloids, roquefortine A, B and C from the cultures of Penicillium roqueforti: S. Ohmomo, et al.; Agric. Biol. Chem. **39,** 1333 (1975) ▪ Molecular requirements for inhibition of cytochrome p450 activities by roquefortine: C. Aninat, et al.; Chem. Res. Toxicol. **14,** 1259 (2001)

NEW Roquefortine E

ALX-350-343-M001 1 mg

Analog of roquefortine C.

LIT: Roquefortine E, a diketopiperazine from an Australian isolate of Gymnoascus reessii: B. Clark, et al.; J. Nat. Prod. **68,** 1661 (2005)



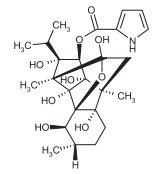
The Ryanodine Source™ High Purity - Low Price

Step up to the Source™

Ryanodine (high purity)

ALX-630-062-M001 1 mg
ALX-630-062-M005 5 mg

Isolated from *Ryania speciosa, Flacourtiaceae.*



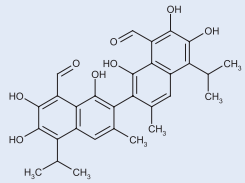
Gossypol has received significant attention as a result of its therapeutic application as a male anti-fertility agent. The latest research on gossypol showed a number of additional biological activities like anti-tumor, anti-viral and anti-oxidant activities, giving a new spotlight on this natural product.

Gossypol

ALX-350-113-M100 100 mg

Isolated from *Gossypium genus, Malvaceae.*

LIT: Investigations on gossypol: past and present developments: K. Dodou; Expert Opin. Investig. Drugs **14,** 1419 (2005)

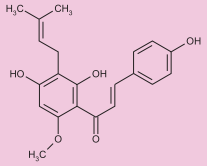


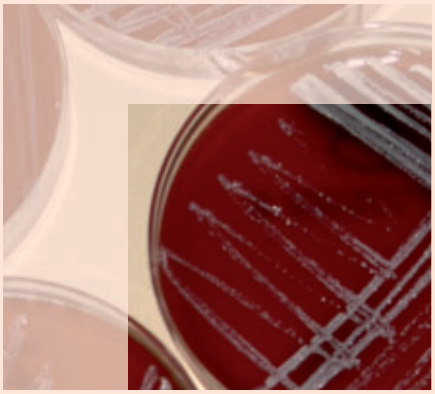
Xanthohumol

ALX-350-280-M005 5 mg

Isolated from hops *(Humulus lupulus).* Prenylated chalcone found in beer. Potent inhibitor of diacylglycerol acetyltransferase [DGAT], which catalyzes the final step in mammalian triacylglycerol synthesis. Inhibits DNA polymerase and induces cell differentiation. Has antiproliferative and cytotoxic effects in human cancer cell lines. Inhibits human P450 enzymes. Induces quinone reductase in mouse Hepa 1c1c7 cells. Inhibits the expression of HIF-1α and VEGF under hypoxic conditions.

LIT: Xanthohumol and related prenylflavonoids from hops and beer: to your good health!: J.F. Stevens & J.E. Page; Phytochemistry **65,** 1317 (2004) (Review)



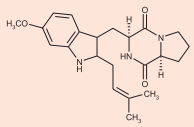


Inhibitor of Microtubule Assembly

NEW Tryprostatin A
ALX-380-090-C500 500 µg

Isolated from *Aspergillus fumigatus*. Inhibitor of microtubule assembly.

LIT: Tryprostatins A and B, novel mammalian cell cycle inhibitors produced by Aspergillus fumigatus: C.B. Cui, et al.; J. Antibiot. **48,** 1382 (1995) ▪ Novel mammalian cell cycle inhibitors, tryprostatins A, B and other diketopiperazines produced by Aspergillus fumigatus. II. Physico-chemical properties and structures: C.B. Cui, et al.; J. Antibiot. **49,** 534 (1996) ▪ Novel mammalian cell cycle inhibitors, tryprostatins A, B and other diketopiperazines produced by Aspergillus fumigatus. I. Taxonomy, fermentation, isolation and biological properties: C.B. Cui, et al.; J. Antibiot. **49,** 527 (1996) ▪ Tryprostatin A, a specific and novel inhibitor of microtubule assembly: T. Usui, et al.; Biochem. J. **333,** 543 (1998) ▪ Reversal of breast cancer resistance protein-mediated drug resistance by tryprostatin A: H. Woehlecke, et al.; Int. J. Cancer **107,** 721 (2003)

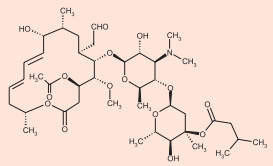


Multidrug Resistance Modulation

Josamycin
ALX-380-078-M100 100 mg

Isolated from *Streptomyces narbonenensis, var. josamyceticus nov. var.* Macrolide antibiotic that may overcome anticancer drug resistance by inhibiting the binding of vinblastine (Prod. No. ALX-350-257) or cyclosporin A (Prod. No. ALX-380-002) to P-glycoprotein (Pgp)

LIT: Reversal of anticancer drug resistance by macrolide antibiotics in vitro and in vivo: L. Wang, et al.; Clin. Exp. Pharmacol. Physiol. **27,** 587 (2000)



Just Introduced!

Angoroside C
ALX-350-331-M001 1 mg
ALX-350-331-M005 5 mg

Isolated from the root of *Scrophularia ningpoensis Hemsl* (Figwort). Potential anti-inflammatory compound. Inhibitor of prostaglandin E_2 release in mouse peritoneal macrophages *in vitro*. Shows potent antioxidative activity in reducing the oxidized OH adducts of dAMP and dGMP.

For Details see Page 14

NEW Asperlactone
ALX-380-122-M001 1 mg
ALX-380-122-M005 5 mg

Isolated from *Aspergillus ochraceus*. Antibiotic with nematicidal, insecticidal, antibacterial and antifungal activity.

NEW Aspyrone
ALX-380-121-M001 1 mg
ALX-380-121-M005 5 mg

Isolated from *Aspergillus ochraceus*. Antibiotic with nematicidal, insecticidal, antibacterial and antifungal activity.

NEW Hypothemycin
ALX-380-116-C250 250 µg
ALX-380-116-M001 1 mg

Isolated from *Phoma* sp. Exhibits antifungal activity and cytotoxic activity against some tumor cell lines partly attributed to inhibition of Ras-inducible genes. Inhibits proliferation of mouse and human T cells and modulates production of cytokines during T cell activation. Facilitates the ubiquitinylation process of cyclin D1. Has been identified as a potent and selective inhibitor of threonine/tyrosine-specific kinase, MEK, and other protein kinases that contain a conserved cysteine residue in the ATP-binding site in both *in vitro* and *in vivo* studies.

NEW Reticulol
ALX-380-118-C250 250 µg
ALX-380-118-M001 1 mg

Isolated from *Streptomyces* sp. Antibiotic. Inhibitor of cyclic adenosine 3',5'-monophosphate phosphodiesterase and topoisomerase I (Topo I). Antitumor agent.

NEW Rubiginone D2
ALX-380-120-M001 1 mg
ALX-380-120-M005 5 mg

Isolated from *Streptomyces* sp. (strain Gö N1/5). Antibacterial and antitumor compound.

NEW UK-1
ALX-380-117-C250 250 µg
ALX-380-117-M001 1 mg

Isolated from *Streptomyces* sp. Antibiotic. Antifungal. Inhibitor of topoisomerase II (Topo II). Mg^{2+}- and Zn^{2+}-dependent DNA binding agent. Displays a wide spectrum of potent anticancer activities.

Your Source for G418 . sulfate

Step up to the Source™

G418 . sulfate
ALX-380-013-M100 100 mg
ALX-380-013-M500 500 mg
ALX-380-013-G001 1 g
ALX-380-013-G005 5 g

Gentamycin-class aminoglycoside antibiotic. Cytotoxic to prokaryotic and eukaryotic cells. Widely employed in the selection of eukaryotic expression vectors, in combination with either aminoglycoside phosphotransferase 3' or APH II.

LIT: Antibiotic G-418, a new Micromonospora-produced aminoglycoside with activity against protozoa and helminths: fermentation, isolation, and preliminary characterization: G.H. Wagman, et al.; Antimicrob. Agents Chemother. **6,** 144 (1974) ▪ Phosphatidylinositol phospholipase C is activated allosterically by the aminoglycoside G418. 2-deoxy-2-fluoro-scyllo-inositol-1-O-dodecylphosphonate and its analogs inhibit glycosylphosphatidylinositol phospholipase C: J.C. Morris, et al.; J. Biol. Chem. **271,** 15468 (1996) ▪ Addition of G418 and other aminoglycoside antibiotics to mammalian cells results in the release of GPI-anchored proteins: M. Kung, et al.; FEBS Lett. **409,** 333 (1997) ▪ Cytochrome c release and endoplasmic reticulum stress are involved in caspase-dependent apoptosis induced by G418: Q.H. Jin, et al.; Cell. Mol. Life Sci. **61,** 1816 (2004) ▪ Expression and distribution of HSP27 in response to G418 in different human breast cancer cell lines: L. Qian, et al.; Histochem. Cell Biol. **126,** 593 (2006)

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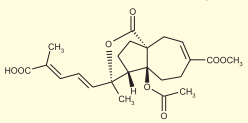
Pseudolaric acid B
[Pseudolarix acid B; PLAB; PAB]

ALX-350-108-MC01 0.1 mg
ALX-350-108-M001 1 mg



Exerts a panel of interesting biological activities.

LIT: Pseudolarix acid B, a new tubulin-binding agent, inhibits angiogenesis by interacting with a novel binding site on tubulin: Y.G. Tong, et al.; Mol. Pharmacol. **69,** 1226 (2006)

Widest Panel of Mycotoxins
- Latest Additions -

Fumitremorgin C
ALX-350-127-C250 250 µg

Fumigaclavine A
ALX-630-110-M001 1 mg
ALX-630-110-M005 5 mg

Moniliformin . Na
ALX-630-111-M001 1 mg
ALX-630-111-M005 5 mg

For a Complete Overview see Pages 2-3

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