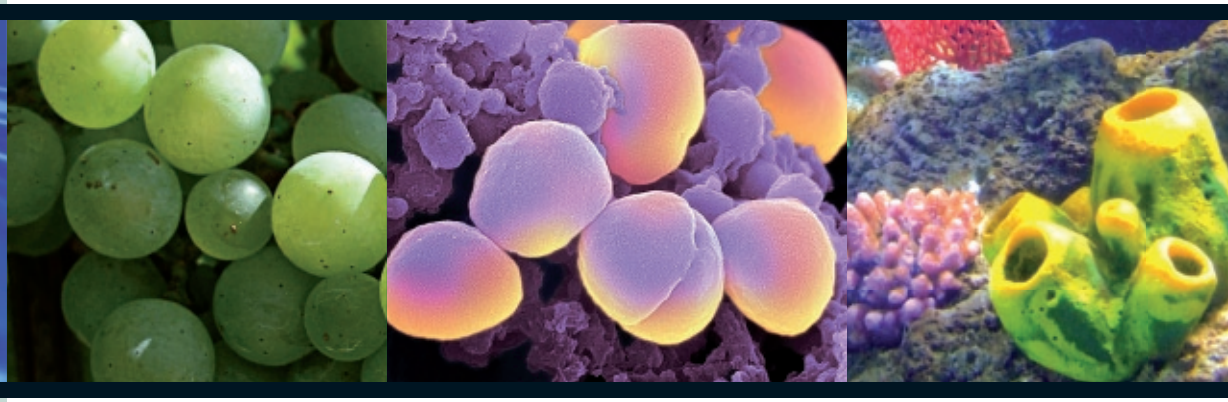
CATALOG & HANDBOOK

ALEXIS® BIOCHEMICALS



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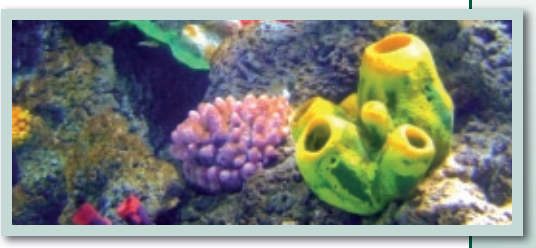

Throughout history of humankind, products extracted from living organisms have been a principal source of medicines, with the first records dating from about 2600 BC in Mesopotamia. Natural products have been transformed into modern drugs, of which the antimalarial quinine and the antipyretic analgesic aspirin are the archetypical ones. Today, there are still a relatively high number of natural products and their derivatives among the best selling drugs.

In favor of high-throughput screening of mass-produced combinatorial compound collections, several pharmaceutical companies once have deemphasized their natural product research. However, while there are certain disadvantages in the use of natural compounds in high throughput screening processes, pharmaceutical companies realize again the significance of natural extracts. This, because natural compounds are often more diverse and more complex stereochemical structures than synthetic ones. Moreover, natural products have been selected by nature for their biological activity, in some cases over millennia.

Antibiotics present one class of natural compounds, important in controlling microorganisms. However, especially in intensive care environments, the number of bacterial strains resistant against antibiotics is rising. The development of new antibiotics is one important step to prevent a future in which bacteria are once again widespread killers.

Given that only a fraction of species has been explored in isolated ecosystems such as the deep sea, one can expect many more molecules derived from nature with surprising biological activities in future.

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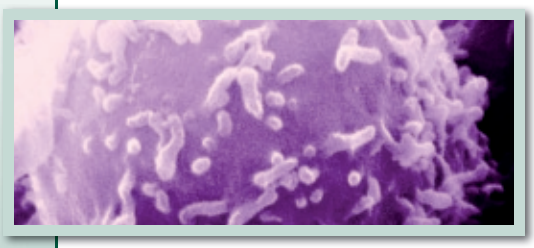


Latest Additions

Floxacins – Wide Panel of Synthetic Antibiotics

Product Name	CAS No.	MI 14:	Prod No.	Size
Ciprofloxacin	85721-33-1	2314	ALX-380-287-G005 ALX-380-287-G025	5 g 25 g
Ciprofloxacin . HCl	86393-32-0	2314	ALX-380-288-G005 ALX-380-288-G025	5 g 25 g
Clinafloxacin . HCl	105956-97-6	2355	ALX-380-289-M250 ALX-380-289-G001	250 mg 1 g
Enrofloxacin	93106-60-6	3592	ALX-380-290-G005 ALX-380-290-G025	5 g 25 g
Gatifloxacin	112811-59-3	4376	ALX-380-291-G001 ALX-380-291-G005	1 g 5 g
Levofloxacin . HCl	100986-85-4	4376	ALX-380-292-G001 ALX-380-292-G005	1 g 5 g
Lomefloxacin . HCl	98079-51-7	5562	ALX-380-293-G001 ALX-380-293-G005	1 g 5 g
Nadifloxacin	124858-35-1	6345	ALX-380-294-M250 ALX-380-294-G001	250 mg 1 g
Norfloxacin	70458-96-7	6700	ALX-380-295-G001 ALX-380-295-G005	1 g 5 g
Norfloxacin nicotinate	118803-81-9	6700	ALX-380-296-G001 ALX-380-296-G005	1 g 5 g
Ofloxacin	82419-36-1	6771	ALX-380-297-G005	5 g
Pefloxacine . mesylate . $2H_2O$	149676-40-4	7066	ALX-380-298-G005	5 g
Prulifloxacin	123447-62-1	7908	ALX-380-299-M250 ALX-380-299-G001	250 mg 1 g
Rufloxacin . HCl	106017-08-7	8294	ALX-380-300-M050 ALX-380-300-M250	50 mg 250 mg
Sarafloxacin . HCl	91296-87-6	8370	ALX-380-301-G005 ALX-380-301-G025	5 g 25 g
Sparfloxacin	11087186-8	8735	ALX-380-302-G001 ALX-380-302-G005	1 g 5 g
Tosulfloxacin tosylate	115964-29-9	9555	ALX-380-303-M250 ALX-380-303-G001	250 mg 1 g

Floxacins are quinolones which comprise a relatively large group of synthetic antibiotics. The first of these compounds was the naphthyridine agent, nalidixic acid, an antibacterial by-product of chloroquine synthesis. Two major structures have been developed from the basic compound: the quinolones with a carbon and associated group at position 8 and the naphthyridones with nitrogen at position 8.

The third generation of fluoroquinolones are compounds as clinafloxacin. Substituents at position 8 impact good anaerobic activity. Halogens at C-8 are associated with poor stability to UV-light and phototoxicity. Better results were obtained with a methoxy group at C-8. Toxicity and side-effects such as allergies and gastrointestinal problems have resulted in the withdrawal of some promising compounds. Positive features of the new generation fluoroquinolones are:

- High bioavailability, better pharmacokinetics and tissue penetration
- Low protein binding
- Longer half-lives
- Higher activities against Gram-positive cocci (especially pneumococci) and against anaerobes.

For Details see Technical Note Page 99

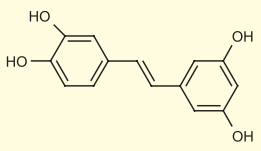
Piceatannol

Piceatannol (*trans*-3,4,3′,5′-tetrahydroxystilbene) is a naturally occurring polyphenol and an analog of the cancer chemopreventive agent resveratrol (*trans*-3,5,4′-trihydroxystilbene) (Prod. No. ALX-270-125, see page 70). Both compounds are synthesized in plants in response to fungal or other environmental stress, classifying them as phytoalexins. Piceatannol was first isolated from the seeds of *Euphorbia lagascae*, which is used in folk medicine to treat cancer, tumors and warts. The protein kinase inhibitor piceatannol modifies multiple cellular targets exerting antioxidant, immunosuppressive, antileukemic and antitumorigenic activities. Piceatannol suppresses NF-κB activation induced by various inflammatory agents through inhibition of IκBκ kinase and p65 phosphorylation. In cancer cells, piceatannol induces cell cycle arrest and apoptosis.

LIT: Use of potato disc and brine shrimp bioassays to detect activity and isolate piceatannol as the antileukemic principle from the seeds of Euphorbia lagascae: N.R. Ferrigni, et al.; J. Nat. Prod. **47,** 347 (1984) ▪ Piceatannol (3,4,3′,5′-tetrahydroxy-trans-stilbene) is a naturally occurring protein-tyrosine kinase inhibitor: R.L. Geahlen & J.L. McLaughlin; BBRC **165,** 241 (1989) ▪ Piceatannol, a hydroxylated analog of the chemopreventive agent resveratrol, is a potent inducer of apoptosis in the lymphoma cell line BJAB and in primary, leukemic lymphoblasts: T. Wieder, et al.; Leukemia **15,** 1735 (2001) ▪ Piceatannol, a natural analog of resveratrol, inhibits progression through the S phase of the cell cycle in colorectal cancer cell lines: F. Wolter, et al.; J. Nutr. **132,** 298 (2002) ▪ Piceatannol inhibits TNF-induced NF-kappaB activation and NF-kappaB-mediated gene expression through suppression of IkappaBalpha kinase and p65 phosphorylation: K. Ashikawa, et al.; J. Immunol. **169,** 6490 (2002) ▪ Antioxidant activity of resveratrol, piceatannol and 3,3′,4,4′,5,5′-hexahydroxy-trans-stilbene in three leukemia cell lines: Z. Ovesna, et al.; Oncol. Rep. **16,** 617 (2006) ▪ Piceatannol attenuates hydrogen-peroxide- and peroxynitrite-induced apoptosis of PC12 cells by blocking down-regulation of Bcl-X(L) and activation of JNK: H.J. Kim, et al.; J. Nutr. Biochem. **Epub ahead of print,** (2007)

Piceatannol

ALX-270-202-M001	1 mg
ALX-270-202-M005	5 mg
ALX-270-202-M010	10 mg
ALX-270-202-M050	50 mg



Azaspiracids

Azaspiracids (Azas) are marine phycotoxins thought to originate from the dinoflagellate *Prototoperidinium sp.* and found in several mussels. So far, 11 azaspiracids (Aza-1 to Aza-11) have been isolated, whereas Aza-1 to Aza-3 are the predominant in nature. Azaspiracids are cytotoxic in nanomolar range and have been shown to be strong neurotoxins. The full mechanism of action of azaspiracids is still unknown and may include, i) modulation of intracellular cAMP and calcium levels, ii) induction of actin cytoskeleton rearrangement which reduces cell adhesion, iii) inhibition of cell growth and reduction of cell population progressing into S-phase of cell cycle, and iv) activation of non-apoptotic cell death. Recently, it was shown that JNK activation and nuclear translocation of active JNK is responsible for the cytotoxic effect of azaspiracid-1 in neurons.

LIT: Azaspiracid-1, a potent, nonapoptotic new phycotoxin with several cell targets: Y. Roman, et al.; Cell Signal. **14,** 703 (2002) ▪ Cytotoxic and cytoskeletal effects of azaspiracid-1 on mammalian cell lines: M.J. Twiner, et al.; Toxicon **45,** 891 (2005) ▪ Cell growth inhibition and actin cytoskeleton disorganization induced by azaspiracid-1 structure-activity studies: N. Vilarino, et al.; Chem. Res. Toxicol. **19,** 1459 (2006) ▪ Effects of azaspiracid-1, a potent cytotoxic agent, on primary neuronal cultures. A structure-activity relationship study: C. Vale, et al.; J. Med. Chem. **50,** 356 (2007) ▪ rreversible cytoskeletal disarrangement is independent of caspase activation during in vitro azaspiracid toxicity in human neuroblastoma cells: N. Vilarino, et al.; Biochem. Pharmacol. **74,** 327 (2007) ▪ The c-Jun-N-terminal kinase is involved in the neurotoxic effect of azaspiracid-1: C. Vale, et al.; Cell Physiol. Biochem. **20,** 957 (2007)

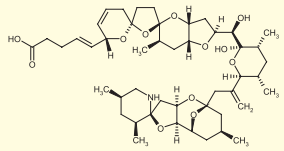
NEW

Azaspiracid-1

ALX-350-366-C001 1 µg

Activator of JNK (c-Jun-N-terminal kinase). Cellular growth inhibitor and inducer of cytoskeletal alterations. Activator of caspases. Modulator of intracellular cAMP (cyclic adenosine monophosphate) and calcium levels. Inhibitor of cholesterol biosynthesis in human T lymphocyte cells. Cytotoxic to mammalian cells.

LIT: Multiple organ damage caused by a new toxin azaspiracid, isolated from mussels produced in Ireland: E. Ito, et al.; Toxicon **38,** 917 (2000) ▪ Azaspiracid-1, a potent, nonapoptotic new phycotoxin with several cell targets: Y. Roman, et al.; Cell. Signal. **14,** 703 (2002) ▪ Cytotoxic and cytoskeletal effects of azaspiracid-1 on mammalian cell lines: M.J. Twiner, et al.; Toxicon **45,** 891 (2005) ▪ Azaspiracids modulate intracellular pH levels in human lymphocytes: A. Alfonso, et al.; BBRC **346,** 1091 (2006) ▪ Cell growth inhibition and actin cytoskeleton disorganization induced by azaspiracid-1 structure-activity studies: N. Vilarino, et al.; Chem. Res. Toxicol. **19,** 1459 (2006) ▪ The c-Jun-N-terminal kinase is involved in the neurotoxic effect of azaspiracid-1: C. Vale, et al.; Cell Physiol. Biochem. **20,** 957 (2007)



Azaspiracid-1

Azaspiracid-2

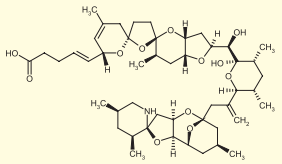
ALX-350-367-C001 1 µg

Azaspiracid-3

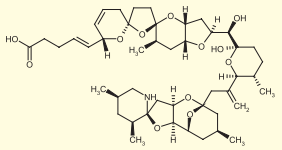
ALX-350-368-C001 1 µg

Azaspiracid-2 and azaspiracid-3 are both isolated from marine mussels. They are modulators of intracellular cAMP (cyclic adenosine monophosphate), calcium and pH levels.

LIT: Effects of Azaspiracids 2 and 3 on intracellular cAMP, [Ca^{2+}], and pH: Y. Roman, et al.; Chem. Res. Toxicol. **17,** 1338 (2004) ▪ Azaspiracids modulate intracellular pH levels in human lymphocytes: A. Alfonso, et al.; BBRC **346,** 1091 (2006)



Azaspiracid-2



Azaspiracid-3

Acivicin [U-42,126]

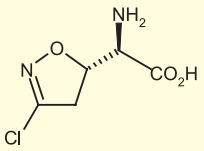
Acivicin is a heterocyclic analog of glutamine with antibiotic, antifungal, anti-neoplastic and enzyme inhibitor activity. It was initially discovered by screening fermentation broths of *Streptomyces sviceus*. Acivicin is a potent antitumor and anti-metastatic compound, however administration of acivicin also causes many undesirable gastrointestinal and neurological side effects.

Acivicin is a specific inhibitor of γ-glutamyl transpeptidase (GGT) and transmembrane glutathione transport. Other enzyme targets are IGP synthetase, GMP synthetase, CPS III, and anthranilate synthetase. It was also described to induce apoptosis independently from the γ-glutamyl transpeptidase activity and inhibits the bioactivation of nitric oxide from GSNO.

LIT: U-42, 126, a new antimetabolite antibiotic: production, biological activity, and taxonomy of the producing microorganism: L.J. Hanka & A. Dietz; Antimicrob. Agents Chemother. **3,** 425 (1973) ▪ Improved methods for production, isolation, and assay of two new chlorisoxazoline amino acid antitumor antimetabolites: U-42, 126 and U43, 795: L.J. Hanka, et al.; Antimicrob. Agents Chemother. **7,** 807 (1975) ▪ The inhibition of gamma-glutamyl transpeptidase from human pancreatic carcinoma cells by (alpha S,5S)-alpha-amino-3-chloro-4,5-dihydro-5-isoxazoleacetic acid (AT-125; NSC-163501): L. Allen, et al.; Res. Commun. Chem. Pathol. Pharmacol. **27,** 175 (1980) ▪ In vivo inactivation by acivicin of carbamoyl-phosphate synthetase II in rat hepatoma: T. Aoki, et al.; Biochem. Pharmacol. **31,** 927 (1982) ▪ Acivicin (AT 125, U 42126): isolation and structure of an alkali-induced contaminant: D.G. Martin, et al.; J. Antibiot. (Tokyo) **39,** 603 (1986) ▪ Interaction of gamma-glutamyl transpeptidase with acivicin: E. Stole, et al.; J. Biol. Chem. **269,** 21435 (1994) ▪ S-Nitrosoglutathione as a substrate for gamma-glutamyl transpeptidase: N. Hogg, et al.; Biochem. J. **323 (Pt 2),** 477 (1997) ▪ Acivicin induces apoptosis independently of gamma-glutamyltranspeptidase activity: H. Aberkane, et al.; BBRC **285,** 1162 (2001) ▪ Inhibition of gamma-glutamyl transpeptidase activity decreases intracellular cysteine levels in cervical carcinoma: P. Ruoso & D.W. Hedley; Cancer Chemother. Pharmacol. **54,** 49 (2004)

Acivicin [U-42126]

ALX-350-354-M005 5 mg
ALX-350-354-M025 25 mg



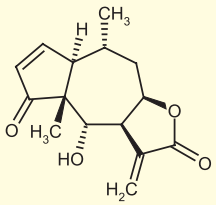
Helenalin – *available from stock!*

The sesquiterpene lactone helenalin is a potent anti-inflammatory and antineoplastic agent. It is the main compound responsible for the therapeutic effects of Arnica. The antitumor activities of helenalin include inhibition of DNA synthesis, tumor growth and telomerase activity. In addition, helenalin induces apoptosis in tumor cells. The anti-inflammatory activity of helenalin is based on its inhibitory action on NF-κB. Moreover, helenalin shows an inhibitory effect on 5-lipoxygenase and leukotriene C4 synthase in human blood cells. *In vitro*, helenalin has anti-trypanosomal activity and is toxic to *plasmodium falciparum*. Recently, D. Boulanger, et al. reported that helenalin reduces *Staphylococcus aureus* infection *in vitro* and *in vivo*.

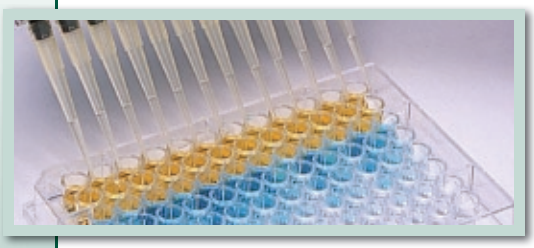
LIT: Constituents of Helenium species.XIII. The structure of Helenalin and Mexicanin A: W. Herz, et al.; JACS **85,** 19 (1963) ▪ Antitumor agents. 21. A proposed mechanism for inhibition of cancer growth by tenulin and helenalin and related cyclopentenones: I.H. Hall, et al.; J. Med. Chem. **20,** 333 (1977) ▪ Effect of helenalin and bis(helenalinyl) malonate on nucleic acid and protein synthesis in human KB carcinoma cells: I.H. Hall, et al.; Pharm. Res. **4,** 509 (1987) ▪ The anti-inflammatory sesquiterpene lactone helenalin inhibits the transcription factor NF-kappaB by directly targeting p65: G. Lyss, et al; J. Biol. Chem. **273,** 33508 (1998) ▪ Helenalin triggers a CD95 death receptor-independent apoptosis that is not affected by overexpression of Bcl-x(L) or Bcl-2: V.M. Dirsch, et al.; Cancer Res. **61,** 5817 (2001) ▪ Inhibitory effects of helenalin and related compounds on 5-lipoxygenase and leukotriene C(4) synthase in human blood cells: S. Tornhamre, et al.; Biochem. Pharmacol. **62,** 903 (2001) ▪ Anti-trypanosomal activity of helenalin and some structurally related sesquiterpene lactones: T.J. Schmidt, et al.; Planta Med. **68,** 750 (2002) ▪ Potent inhibition of human telomerase by helenalin: P.R. Huang, et al.; Cancer Lett. **227,** 169 (2005) ▪ Helenalin reduces Staphylococcus aureus infection in vitro and in vivo: D. Boulanger, et al.; Vet. Microbiol. **119,** 330 (2007)

Helenalin

ALX-350-120-MC05 0.5 mg



ALEXIS® BIOCHEMICALS



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Actinomycins

Actinomycin C	ALX-380-024	Actinomycin D	ALX-380-009	Actinomycin X2	ALX-380-080
Actinomycin C2	ALX-380-082	Actinomycin X0β	ALX-380-083	Actinomycin Z1	ALX-380-085
Actinomycin C3	ALX-380-077	Actinomycin X0δ	ALX-380-084	7-Amino-actinomycin D	ALX-380-283

Aflatoxins

Aflatoxin B1	ALX-630-093	Aflatoxin G1	ALX-630-104	Aflatoxin M1	ALX-630-095
Aflatoxin B2	ALX-630-103	Aflatoxin G2	ALX-630-106	Aflatoxin M2	ALX-630-114

Alkaloids

Aaptamine	ALX-350-104	(+)-Egenine	ALX-350-362	Paxilline	ALX-630-019
Aconitine	ALX-550-232	Emetine . 2HCl	ALX-350-092	Penitrem A	ALX-630-020
Aerophobin-2	ALX-350-156	Fascaplysin	ALX-270-300	(+)-Pilocarpine . HCl	ALX-550-092
Agelongine	ALX-350-326	Fumigaclavine A	ALX-630-110	Pimprinine	ALX-380-234
Anabasine . HCl	ALX-350-112	Galanthamine . HBr	ALX-550-336	Quinidine . sulfate	ALX-550-291
Aristolochic acid	ALX-270-047	Harmine	ALX-350-371	Quinine . hemisulfate	ALX-550-292
Australine . HCl	ALX-270-157	(+)-Himbacine	ALX-550-061	Roquefortine C	ALX-350-342
Berberine . hemisulfate	ALX-350-094	Homoharringtonine	ALX-350-236	Roquefortine E	ALX-350-343
Caffeine	ALX-550-322	(-)-Huperzine A	ALX-550-065	Ryanodine (high purity)	ALX-630-062
(+)-Calystegine B2	ALX-350-314	10Z-Hymenialdisine	ALX-350-289	Sanguinarine chloride	ALX-350-076
(S)-(+)-Camptothecin	ALX-350-015	Hymenidin	ALX-350-291	Sceptrin . 2HCl	ALX-350-264
(E)-Capsaicin	ALX-550-066	Isofistularin-3	ALX-350-157	(-)-Scopolamine . HBr	ALX-550-094
Castanospermine	ALX-270-160	Isotetrandrine	ALX-350-035	Staurosporine	ALX-380-014
Catharanthine . tartrate	ALX-350-101	K-252a	ALX-380-027	Stellettamide A . trifluoroacetate	ALX-350-311
Chelerythrine chloride	ALX-350-008	K-252b	ALX-380-029	Swainsonine	ALX-350-077
Colchicine	ALX-380-033	K-252c	ALX-380-103	Theobromine	ALX-480-061
Cylindrospermopsin	ALX-350-149	KT5720	ALX-270-075	Theophylline	ALX-480-062
Cytochalasin A	ALX-380-057	KT5823	ALX-270-087	(+)-Tubocurarine . dichloride	ALX-550-182
Cytochalasin B	ALX-380-012	Kuanoniamine C	ALX-350-262	Tylophorine	ALX-350-154
Cytochalasin B, Dihydro-	ALX-350-053	Lobeline . HCl	ALX-420-023	UCN-01	ALX-380-222
Cytochalasin C	ALX-380-069	(+)-Madindoline A	ALX-350-328	UCN-02	ALX-380-206
Cytochalasin D	ALX-380-031	Manzamine A	ALX-350-294	Veratridine	ALX-550-307
Cytochalasin E	ALX-380-062	Meleagrin	ALX-350-297	Verruculogen	ALX-380-056
Debromohymenialdisine	ALX-350-290	Midpacamide	ALX-350-327	Vinblastine . sulfate	ALX-350-257
Deoxygalactonojirimycin . HCl	ALX-580-001	7-Oxostaurosporine	ALX-380-210	Vincristine . sulfate	ALX-350-069
1-Deoxymannojirimycin . HCl	ALX-580-002	Paclitaxel	ALX-351-001	Vindoline	ALX-350-102
1-Deoxynojirimycin	ALX-580-003	Papaverine . HCl	ALX-270-110	Viridicatin	ALX-350-136
Dihydrocapsaicin	ALX-350-052	Papuamine	ALX-350-348		

Angiogenesis Modulators

(+)-Aeroplysinin-1	ALX-350-256	17-DMAG	ALX-380-110	Lavendustin A	ALX-350-007
Apigenin	ALX-385-008	Doxycycline . hyclate	ALX-380-273	Luteolin	ALX-385-007
Artemisinin	ALX-350-219	Emodin	ALX-350-057	Magnolol	ALX-350-352
Asterric acid	ALX-380-208	Fumagillin	ALX-350-119	Minocycline . HCl	ALX-380-109
Baicalein	ALX-385-022	Genistein (synthetic)	ALX-350-006	Pseudolaric acid B	ALX-350-108
Borrelidin	ALX-380-102	Herbimycin A	ALX-350-029	Pyrrolostatin	ALX-350-252
Castanospermine	ALX-270-160	Honokiol	ALX-350-350	Radicicol	ALX-380-092
Cochlioquinone A	ALX-350-335	Hyperforin . DCHA (high purity)	ALX-350-097	Sulochrin	ALX-380-221
Cochlioquinone B	ALX-350-341	8-Isopentenylnaringenin	ALX-385-025	Thiolutin	ALX-380-200
Cytochalasin E	ALX-380-062	Lactacystin (native)	ALX-350-245	*trans*-3,4′,5-Trimethoxy-stilbene	ALX-350-345
Delphinidin chloride (high purity)	ALX-385-028	Lactacystin (synthetic)	ALX-350-260	Withaferin A	ALX-350-153

Antibacterial / Antifungal / Antimicrobial Compounds

A23187 (free acid) [Calcimycin]	ALX-450-001	Allicin	ALX-350-329	(-)-Arctigenin	ALX-350-312
A23187 (Mixed Calcium-Magnesium Salt)	ALX-450-002	Altenusin	ALX-350-325	(-)-Arctiin	ALX-350-318
A23187; 4-Bromo-	ALX-450-003	Alternariol	ALX-350-139	Artemisinin	ALX-350-219
17-AAG	ALX-380-091	Amikacin (free base)	ALX-380-045	Ascochlorin	ALX-350-334
Actinomycin C	ALX-380-024	Amikacin . disulfate	ALX-380-266	Ascomycin	ALX-380-005
Actinomycin C2	ALX-380-082	7-Amino-actinomycin D	ALX-380-283	Asperlactone	ALX-380-122
Actinomycin C3	ALX-380-077	Amphotericin B	ALX-380-280	Aspyrone	ALX-380-121
Actinomycin D	ALX-380-009	Ampicillin . Na	ALX-380-268	Asterric acid	ALX-380-208
Actinomycin X0β	ALX-380-083	Ampullosporin A	ALX-350-106	Atpenin A5	ALX-380-108
Actinomycin X0δ	ALX-380-084	Anguinomycin A	ALX-380-202	Aurantimycin A	ALX-380-086
Actinomycin X2	ALX-380-080	Angustmycin A	ALX-380-125	Aureothricin	ALX-380-240
Actinomycin Z1	ALX-380-085	Anisomycin	ALX-380-051	Avarol	ALX-350-319
Actinonin	ALX-260-128	Ansatrienin A	ALX-380-203	Avarone	ALX-350-321
Aerophobin-2	ALX-350-156	Ansatrienin B	ALX-380-204	Bafilomycin A1	ALX-380-030
(+)-Aeroplysinin-1	ALX-350-256	Antimycin A	ALX-380-075	Bafilomycin B1	ALX-380-063
Agelasine D	ALX-350-315	Apicidin	ALX-350-095	Bafilomycin C1	ALX-380-209
Alamethicin	ALX-380-046	Apoptolidin	ALX-380-207	Baicalein	ALX-385-022

Bakuchiol	ALX-350-144
Batumin	ALX-380-081
Becatecarin	ALX-380-119
Berberine . hemisulfate	ALX-350-094
Betulinic acid (~95%)	ALX-350-298
Betulinic acid (high purity)	ALX-350-277
Blasticidin A	ALX-380-241
Blasticidin S . HCl	ALX-380-089
Bleomycin sulfate	ALX-630-107
Borrelidin	ALX-380-102
(+)-Brefeldin A	ALX-350-019
Caffeic acid	ALX-270-231
Calphostin C	ALX-350-027
Carbenicillin . 2Na	ALX-380-270
Carnosic acid	ALX-270-264
Castanospermine	ALX-270-160
Cefaclor	ALX-380-016
Cefazolin . Na	ALX-380-044
Cefotaxime . Na	ALX-380-271
Cerulenin	ALX-380-053
Chaetocin (high purity)	ALX-380-242
Chaetoglobosin A	ALX-350-131
Chartreusin	ALX-380-073
Chetomin	ALX-350-128
Chlortetracycline . HCl	ALX-350-238
Chromomycin A3	ALX-380-055
Chrysomycin A	ALX-380-112
Chrysomycin B	ALX-380-114
Cinoxacin	ALX-380-017
Citrinin	ALX-380-058
Cochliodinol	ALX-350-316
Colchicine	ALX-380-033
Colistin . sulfate	ALX-380-272
Concanamycin A	ALX-380-034
Concanamycin B	ALX-380-098
Concanamycin C	ALX-380-099
Conglobatin	ALX-380-225
CRAMP (mouse)	PT-PA-AMP-002
CRAMP-18 (mouse)	PT-PA-AMP-003
Cycloheximide	ALX-380-269
Cyclosporin A	ALX-380-002
Cyclosporin C	ALX-380-282
Cyclosporin D	ALX-380-284
Cyclosporin H	ALX-380-286
Cytochalasin A	ALX-380-057
Cytochalasin B	ALX-380-012
Cytochalasin B, Dihydro-	ALX-350-053
Cytochalasin C	ALX-380-069
Cytochalasin D	ALX-380-031
Cytochalasin E	ALX-380-062
Dammarenolic acid	ALX-350-155
Daunorubicin . HCl	ALX-380-043
Decoyinine	ALX-380-032
Dinactin	ALX-380-226
17-DMAG	ALX-380-110
Doxorubicin . HCl	ALX-380-042
Doxycycline . hyclate	ALX-380-273
Echinomycin	ALX-380-201
Echinosporin	ALX-380-115
Elaiophylin	ALX-380-212
EM574 [Motilide]	ALX-380-264
Emetine . 2HCl	ALX-350-092
Enniatin B	ALX-380-007
Epoxomicin	ALX-350-254
Equisetin	ALX-350-322
Erythromycin	ALX-380-274
Eugenol (high purity)	ALX-350-123
Ferulenol	ALX-350-124
FK506	ALX-380-008
Fostriecin	ALX-380-065
Fumagillin	ALX-350-119
Fusaric acid	ALX-380-052
Fusidic acid . Na	ALX-380-011
G418 . sulfate	ALX-380-013
Gallidermin	ALX-380-072
Geldanamycin	ALX-380-054
Geninthiocin	ALX-380-227
Gentamicin sulfate	ALX-380-003
Gilvocarcin M	ALX-380-228
Gilvocarcin V	ALX-380-113
Gliotoxin	ALX-350-239
Gossypol	ALX-350-113
Gramicidin A (high purity)	ALX-350-233
Herbimycin A	ALX-350-029
Herbimycin C	ALX-350-349
Hexacyclinic acid	ALX-380-123
Hexaprenylhydroquinone	ALX-350-138
HNP 1-3 (Mature Peptides) (human)	PT-PA-AMP-001
Honokiol	ALX-350-350
Hurghadolide A	ALX-350-357
21-Hydroxyoligomycin A	ALX-380-224
Hygromycin B (liquid)	ALX-380-059
Hymeglusin	ALX-380-265
Hyperforin . DCHA (high purity)	ALX-350-097
Hypericin (native)	ALX-350-030
Hypothemycin	ALX-380-116
Idarubicin . HCl	ALX-380-260
Ilimaquinone	ALX-350-240
Imperatorin	ALX-350-302
Ionomycin (free acid)	ALX-450-006
Ionomycin . Ca	ALX-450-007
Isoapoptolidin	ALX-380-229
Isobavachalcone	ALX-350-145
Isofistularin-3	ALX-350-157
Isorhamnetin	ALX-385-024
Josamycin	ALX-380-078
K-252a	ALX-380-027
K-252b	ALX-380-029
K-252c	ALX-380-103
Kanamycin . sulfate	ALX-380-049
Kanamycin A . sulfate	ALX-380-275
Kanamycin B . sulfate	ALX-380-094
Kasugamycin . HCl	ALX-380-076
Kazusamycin A	ALX-380-230
Kazusamycin B	ALX-380-231
Kendomycin	ALX-380-066
Kigamicin C	ALX-380-213
KT5720	ALX-270-075
KT5823	ALX-270-087
Lactacystin (native)	ALX-350-245
Lactacystin (synthetic)	ALX-350-260
clasto-Lactacystin β-lactone (synthetic)	ALX-270-280
16-epi-Latrunculin B	ALX-350-359
Leptomycin A	ALX-380-101
Leptomycin B	ALX-380-100
Leptomycin Set I	ALX-850-313
Leptomycin Set II	ALX-850-316
Limonin	ALX-350-225
Lincomycin . HCl	ALX-380-276
LL-37 (human)	PT-PA-AMP-004
LL-Z1640-2	ALX-380-267
Lydicamycin	ALX-380-232
Magnolol	ALX-350-352
Manumycin A	ALX-350-241
Manzamine A	ALX-350-294
Meleagrin	ALX-350-297
Minocycline . HCl	ALX-380-109
Mitomycin C	ALX-380-023
Monactin	ALX-380-214
Monensin . Na	ALX-380-026
Mycophenolic acid	ALX-380-015
Myriocin	ALX-350-274
Nargenicin A1	ALX-380-096
Neoantimycin	ALX-380-233
Neobavaisoflavone	ALX-350-146
Neomycin sulfate	ALX-380-035
Netilmicin . sulfate	ALX-380-048
Netropsin . 2HCl	ALX-380-088
Nidulal	ALX-350-110
Nigericin . Na	ALX-380-050
Nomilin	ALX-350-228
Nonactin	ALX-450-008
Novobiocin . Na	ALX-380-093
Oligomycin	ALX-380-037
Oligomycin A	ALX-380-036
Oligomycin B	ALX-380-038
Oligomycin C	ALX-380-039
Ophiobolin A	ALX-270-109
Ophiobolin B	ALX-350-338
7-Oxostaurosporine	ALX-380-210
Panepoxydone	ALX-350-109
Papuamine	ALX-350-348
Paraherquamide A	ALX-380-215
Patulin	ALX-270-111
Piericidin A	ALX-380-235
Polymyxin B . sulfate	ALX-380-040
Pseudohypericin	ALX-350-276
Pseudolaric acid B	ALX-350-108
Pseurotin A	ALX-350-300
Psoralen	ALX-350-364
Psoralidin	ALX-350-323
Puerarin	ALX-350-249
Puromycin . 2HCl	ALX-380-028
Puromycin aminonucleoside	ALX-480-083
Quinaldopeptin	ALX-380-236
Quinine . hemisulfate	ALX-550-292
Radicicol	ALX-380-092
Rapamycin	ALX-380-004
Ratjadone A (synthetic)	ALX-270-346
Ratjadone C (native)	ALX-270-369
Rebeccamycin	ALX-380-079
Resistomycin	ALX-380-111
Reticulol	ALX-380-118
Reveromycin A	ALX-380-216
Reveromycin B	ALX-380-217
Reveromycin C	ALX-380-218
Reveromycin D	ALX-380-219
Rifampicin	ALX-380-071
Ristocetin A	ALX-380-237
RK-682	ALX-380-205
Rubiginone D2	ALX-380-120
β-Rubromycin	ALX-380-067
Sceptrin . 2HCl	ALX-350-264
Sedanolide	ALX-350-229
Sinefungin	ALX-380-070
Siomycin	ALX-380-243
Spectinomycin . 2HCl	ALX-380-278
Staurosporine	ALX-380-014
Steffimycin B	ALX-380-220
Streptomycin . sulfate	ALX-380-277
Streptothricin Antibiotic	ALX-380-025
Streptozotocin	ALX-380-010
L-Sulforaphene	ALX-350-231
Sulochrin	ALX-380-221
Swainsonine	ALX-350-077
Swinholide I	ALX-350-356
Tangeretin	ALX-385-027
Tautomycin	ALX-380-041
psi-Tectorigenin	ALX-270-123
Tenuazonic acid	ALX-350-317
Tetracycline . HCl	ALX-380-060
Thalassiolin B	ALX-350-296
Thimerosal	ALX-400-013
Thiolutin	ALX-380-200
Thiostrepton	ALX-380-261
Tiliroside	ALX-350-305
Tobramycin	ALX-380-018
Trichostatin A	ALX-380-068
Trichostatin C	ALX-380-239
Trinactin	ALX-380-238
Troleandomycin	ALX-380-001
Tryprostatin A	ALX-380-090
Tunicamycin	ALX-380-047
UCN-01	ALX-380-222
UCN-02	ALX-380-206
UK-1	ALX-380-117
Valinomycin	ALX-450-012
Vancomycin . HCl	ALX-380-279
Venturicidin A	ALX-380-211
Venturicidin B	ALX-380-223
Verruculogen	ALX-380-056
Viridicatin	ALX-350-136
Virstatin	ALX-430-147
Wortmannin	ALX-350-020
WP631 . 2HCl	ALX-380-064
WP631 . dimethanesulfonate	ALX-380-074
X-206	ALX-380-087
Xanthorrhizol	ALX-350-263

Anticancer (Antineoplastic) / Chemopreventive / Cytotoxic Compounds

17-AAG	ALX-380-091	Daidzin	ALX-350-248	Myristicin, Dihydro-	ALX-350-222
Aaptamine	ALX-350-104	Daunorubicin . HCl	ALX-380-043	(±)-Naringenin	ALX-385-010
3-O-Acetyl-betulinic acid	ALX-350-313	Decoyinine	ALX-380-032	Neoantimycin	ALX-380-233
3-O-Acetyl-β-boswellic acid	ALX-350-308	Deguelin	ALX-350-118	Netropsin . 2HCl	ALX-380-088
3-O-Acetyl-11-keto-β-boswellic acid	ALX-350-310	3,3′-Diindolylmethane	ALX-350-370	Nidulal	ALX-350-110
Actinomycin C	ALX-380-024	Dinactin	ALX-380-226	Nomilin	ALX-350-228
Actinomycin C2	ALX-380-082	Diosmin	ALX-385-031	Nonactin	ALX-450-008
Actinomycin C3	ALX-380-077	17-DMAG	ALX-380-110	Nordihydroguaiaretic acid	ALX-350-086
Actinomycin D	ALX-380-009	Doxocycline . hyclate	ALX-380-273	Odorine	ALX-350-304
Actinomycin X0β	ALX-380-083	Doxorubicin . HCl	ALX-380-042	Odorinol	ALX-350-306
Actinomycin X0δ	ALX-380-084	Echinomycin	ALX-380-201	Oligomycin	ALX-380-037
Actinomycin X2	ALX-380-080	Echinosporin	ALX-380-115	Oligomycin A	ALX-380-036
Actinomycin Z1	ALX-380-085	Elaiophylin	ALX-380-212	Oligomycin B	ALX-380-038
Actinonin	ALX-260-128	Ellagic acid	ALX-270-262	Oligomycin C	ALX-380-039
(+)-Aeroplysinin-1	ALX-350-256	Emodin	ALX-350-057	Ophiobolin A	ALX-270-109
Agelasine D	ALX-350-315	Enniatin B	ALX-380-007	Ophiobolin B	ALX-350-338
Allicin	ALX-350-329	(-)-Epigallocatechin gallate	ALX-270-263	Orlistat	ALX-350-152
7-Amino-actinomycin D	ALX-280-283	Epoxomicin	ALX-350-254	Paclitaxel	ALX-351-001
Anguinomycin A	ALX-380-202	(R,S)-Equol	ALX-385-032	Pectenotoxin-2	ALX-350-369
Angustmycin A	ALX-380-125	Esculin	ALX-350-021	Peonidin chloride	ALX-385-015
Ansatrienin A	ALX-380-203	Etoposide	ALX-270-209	Piericidin A	ALX-380-235
Ansatrienin B	ALX-380-204	Evodiamine	ALX-350-330	PKC412	ALX-380-281
Apigenin	ALX-385-008	Fasciculatin	ALX-350-137	Podophyllotoxin	ALX-630-086
Apoptolidin	ALX-380-207	Ferulenol	ALX-350-124	Polydatin	ALX-350-114
(-)-Arctigenin	ALX-350-312	Folic acid	ALX-460-006	Psoralidin	ALX-350-323
(-)-Arctiin	ALX-350-318	Fostriecin	ALX-380-065	Puromycin aminonucleoside	ALX-480-083
Aristoforin	ALX-350-129	Fumagillin	ALX-350-119	Quinaldopeptin	ALX-380-236
Ascochlorin	ALX-350-334	Geldanamycin	ALX-380-054	Ratjadone A (synthetic)	ALX-270-346
L-(+)-Ascorbic acid	ALX-460-001	Gelonin	ALX-350-150	Ratjadone C (native)	ALX-270-369
Auraptene	ALX-350-361	Genistein (synthetic)	ALX-350-006	Rebeccamycin	ALX-380-079
Aureothricin	ALX-380-240	Genistin	ALX-350-247	Resveratrol	ALX-270-125
Avarol	ALX-350-319	Gilvocarcin M	ALX-380-228	Reticulol	ALX-380-118
Avarone	ALX-350-321	Gilvocarcin V	ALX-380-113	Rocaglamide	ALX-350-121
Baccatin III	ALX-351-005	Gossypol	ALX-350-113	Roquefortine E	ALX-350-343
Baccatin III, 10-Deacetyl-	ALX-351-006	Herbimycin C	ALX-350-349	Rosmarinic acid	ALX-270-253
Becatecarin	ALX-380-119	Hexacyclinic acid	ALX-380-123	Rubiginone D2	ALX-380-120
Berberine . hemisulfate	ALX-350-094	Homoharringtonine	ALX-350-236	β-Rubromycin	ALX-380-067
Betulinic acid (~95%)	ALX-350-298	Honokiol	ALX-350-350	Rutin	ALX-460-028
Betulinic acid (high purity)	ALX-350-277	21-Hydroxyoligomycin A	ALX-380-224	Sedanolide	ALX-350-229
Bleomycin sulfate	ALX-630-107	Hyperforin . DCHA (high purity)	ALX-350-097	Silybin	ALX-350-346
(+)-Brefeldin A	ALX-350-019	Hypericin (native)	ALX-350-030	Siomycin	ALX-380-243
4′-Bromoflavone	ALX-385-029	Hypothemycin	ALX-380-116	Sipholenol A	ALX-350-358
Bryostatin 1	ALX-350-005	Idarubicin . HCl	ALX-380-260	Steffimycin B	ALX-380-220
Butein	ALX-350-246	Ilimaquinone	ALX-350-240	Streptozotocin	ALX-380-010
Cafestol	ALX-350-220	Indole-3-carbinol	ALX-350-347	DL-Sulforaphane	ALX-350-232
Caffeic acid	ALX-270-231	Ingenol 3,20-dibenzoate	ALX-350-032	L-Sulforaphane	ALX-350-230
Caffeic acid ethyl ester	ALX-270-480	Irinotecan . HCl	ALX-430-139	L-Sulforaphene	ALX-350-231
Caffeic acid phenylethyl ester	ALX-270-244	Isobavachalcone	ALX-350-145	Swainsonine	ALX-350-077
Caffeine	ALX-550-322	8-Isopentenylnaringenin	ALX-385-025	Swinholide I	ALX-350-356
Calphostin C	ALX-350-027	Isorhamnetin	ALX-385-024	Tangeretin	ALX-385-027
(S)-(+)-Camptothecin	ALX-350-015	Kaempferol	ALX-385-005	(+)-Taxifolin	ALX-385-018
Carnosol	ALX-270-254	Kahweol	ALX-350-223	Tenuazonic acid	ALX-350-317
(+)-Catechin	ALX-385-017	Kazusamycin A	ALX-380-230	Theonellapeptolide 1d	ALX-350-295
(±)-Catechin	ALX-385-002	Kazusamycin B	ALX-380-231	Theophylline	ALX-480-062
Catharanthine . tartrate	ALX-350-101	Kendomycin	ALX-380-066	Tiliroside	ALX-350-305
Chaetocin	ALX-380-242	Kigamicin C	ALX-380-213	Topotecan . HCl	ALX-350-133
Chaetoglobosin A	ALX-350-131	Kuanoniamine C	ALX-350-262	Trichostatin A	ALX-380-068
Chartreusin	ALX-380-073	Lactacystin (native)	ALX-350-245	*trans*-3,4′,5-Trimethoxy-stilbene	ALX-350-345
Chetomin	ALX-350-128	Lactacystin (synthetic)	ALX-350-260	Triptolide	ALX-350-259
Chlorogenic acid	ALX-350-353	Limonin	ALX-350-225	Tylophorine	ALX-350-154
Chrysin	ALX-385-009	Lupeol	ALX-350-355	UCN-01	ALX-380-222
Chrysomycin A	ALX-380-112	Magnolol	ALX-350-352	UCN-02	ALX-380-206
Chrysomycin B	ALX-380-114	Malvidin chloride	ALX-385-013	UK-1	ALX-380-117
Cochliodinol	ALX-350-316	Mithramycin A	ALX-380-097	Vinblastine . sulfate	ALX-350-257
Concanamycin A	ALX-380-034	Mitomycin C	ALX-380-023	Vincristine . sulfate	ALX-350-069
Concanamycin C	ALX-380-099	Morin	ALX-385-016	Vindoline	ALX-350-102
Cytochalasin D	ALX-380-031	Myricetin	ALX-385-012	Withaferin A	ALX-350-153
Cytochalasin E	ALX-380-062	Myristicin	ALX-350-227	Xanthohumol	ALX-350-280

Anti-HIV / Antiviral Compounds

Altenusin	ALX-350-325	Calphostin C	ALX-350-027	16-*epi*-Latrunculin B	ALX-350-359
(-)-Arctigenin	ALX-350-312	Castanospermine	ALX-270-160	Limonin	ALX-350-225
(-)-Arctiin	ALX-350-318	Concanamycin C	ALX-380-099	Manzamine A	ALX-350-294
Ascochlorin	ALX-350-334	Dammarenolic acid	ALX-350-155	Myriocin	ALX-350-274
Avarol	ALX-350-319	12-Deoxyphorbol 13-acetate	ALX-445-009	Netropsin . 2HCl	ALX-380-088
Avarone	ALX-350-321	Echinomycin	ALX-380-201	Nomilin	ALX-350-228
Baicalein	ALX-385-022	Gossypol	ALX-350-113	Pseudohypericin	ALX-350-276
Betulinic acid (~95%)	ALX-350-298	Hexaprenylhydroquinone	ALX-350-138	Psoralen	ALX-350-364
Betulinic acid (high purity)	ALX-350-277	Hygromycin B (liquid)	ALX-380-059	RK-682	ALX-380-205
Borrelidin	ALX-380-102	Hypericin (native)	ALX-350-030	β-Rubromycin	ALX-380-067
(+)-Brefeldin A	ALX-350-019	Ilimaquinone	ALX-350-240	Tenuazonic acid	ALX-350-317
Caffeic acid	ALX-270-231	Imperatorin	ALX-350-302	Thalassiolin B	ALX-350-296
Caffeic acid phenylethyl ester	ALX-270-244	Isorhamnetin	ALX-385-024		

Antimalarial Compounds

Artemisinin	ALX-350-219	Quinine . hemisulfate	ALX-550-292	X-206	ALX-380-087
Manzamine A	ALX-350-294	Radicicol	ALX-380-092		

Antioxidants

Allicin	ALX-350-329	Delphinidin chloride	ALX-385-028	Nordihydroguaiaretic acid	ALX-350-086
Angoroside C	ALX-350-331	Dihydrocapsaicin	ALX-350-052	n-Octylcaffeate	ALX-350-278
Apigenin	ALX-385-008	3,5-Di-O-caffeoylquinic acid	ALX-350-320	Pelargonidin chloride	ALX-385-014
L-(+)-Ascorbic acid	ALX-460-001	Ellagic acid	ALX-270-262	Peonidin chloride	ALX-385-015
Astaxanthin (crystalline)	ALX-460-031	(-)-Epigallocatechin gallate	ALX-270-263	Polydatin	ALX-350-114
Baicalein	ALX-385-022	Esculin	ALX-350-021	Psoralidin	ALX-350-323
Bakuchiol	ALX-350-144	Eugenol (high purity)	ALX-350-123	Puerarin	ALX-350-249
Bavachin	ALX-350-147	Formononetin (high purity)	ALX-270-312	Pyrrolostatin	ALX-350-252
Butein	ALX-350-246	Genistin	ALX-350-247	Quercetin	ALX-385-001
Caffeic acid	ALX-270-231	Gliotoxin	ALX-350-239	Resveratrol	ALX-270-125
Cannabidiol	ALX-430-152	Gossypol	ALX-350-113	Rosmarinic acid	ALX-270-253
Cannabigerol	ALX-430-154	(±)-Hesperetin	ALX-385-011	Rutin	ALX-460-028
Carazostatin	ALX-350-253	Isorhamnetin	ALX-385-024	Sanguinarine chloride	ALX-350-076
Carnosic acid	ALX-270-264	Kaempferol	ALX-385-005	Sauchinone	ALX-350-116
Carnosine	ALX-153-055	DL-α-Lipoic acid	ALX-270-266	Silybin	ALX-350-346
Carnosol	ALX-270-254	Lupeol	ALX-350-355	(+)-Taxifolin	ALX-385-018
β-Carotene	ALX-460-004	Luteolin	ALX-385-007	(±)-Taxifolin	ALX-385-006
(+)-Catechin	ALX-385-017	Malvidin chloride	ALX-385-013	Tiliroside	ALX-350-305
(±)-Catechin	ALX-385-002	Methyl caffeate	ALX-350-226	DL-α-Tocopherol (high purity)	ALX-460-018
Celastrol	ALX-350-332	Morin	ALX-385-016	DL-α-Tocopherol . acetate	ALX-460-019
Chlorogenic acid	ALX-350-353	Myricetin	ALX-385-012	Trihydroxyethylrutin	ALX-385-030
Cinnamtannin	ALX-350-365	(±)-Naringenin	ALX-385-010	Trolox®	ALX-270-267
Curcumin (high purity)	ALX-350-028	Neobavaisoflavone	ALX-350-146		
Cyanidin chloride	ALX-385-003	Nobiletin	ALX-385-026		

Apoptosis Inducers / Inhibitors

17-AAG	ALX-380-091	Calphostin C	ALX-350-027	(-)-Epigallocatechin gallate	ALX-270-263
3-O-Acetyl-11-keto-β-boswellic acid	ALX-350-310	Calyculin A	ALX-350-014	Esculin	ALX-350-021
3-O-Acetyl-β-boswellic acid	ALX-350-308	Canavanine . sulfate	ALX-350-002	Etoposide	ALX-270-209
Actinomycin C	ALX-380-024	Cerulenin	ALX-380-053	Evodiamine	ALX-350-330
Actinomycin D	ALX-380-009	Chelerythrine chloride	ALX-350-008	Fumonisin B1	ALX-350-017
Actinomycin X0β	ALX-380-083	Chlorogenic acid	ALX-350-353	Fumonisin B2	ALX-350-237
Actinomycin X0δ	ALX-380-084	Chrysin	ALX-385-009	G418 . sulfate	ALX-380-013
Actinomycin X2	ALX-380-080	Cinnamtannin	ALX-350-365	Genistein (synthetic)	ALX-350-006
Allicin	ALX-350-329	Cinobufagin	ALX-350-283	Gliotoxin	ALX-350-239
7-Aminoactinomycin D	ALX-380-283	Citrinin	ALX-380-058	Gossypol	ALX-350-113
Anisomycin	ALX-380-051	Colcemid	ALX-430-033	HC Toxin	ALX-630-102
Antimycin A	ALX-380-075	Colchicine	ALX-380-033	Hellebrin	ALX-350-105
(+)-Aphidicolin	ALX-350-016	Curcumin	ALX-350-028	Heraclenin	ALX-350-303
Apicidin	ALX-350-095	Cycloheximide	ALX-380-269	Homoharringtonine	ALX-350-236
Apigenin	ALX-385-008	Cyclosporin A	ALX-380-002	Honokiol	ALX-350-350
Apoptolidin	ALX-380-207	Cytochalasin D	ALX-380-031	HT-2 Toxin	ALX-630-113
Aristoforin	ALX-350-129	Daunorubicin . HCl	ALX-380-043	Huperzine A	ALX-550-065
L-(+)-Ascorbic acid	ALX-460-001	Deguelin	ALX-350-118	Hyperforin . DCHA (high purity)	ALX-350-097
Auraptene	ALX-350-361	Delphinidin chloride	ALX-385-028	Idarubicin . HCl	ALX-380-260
Bafilomycin A1	ALX-380-030	3,3′-Diindolylmethane	ALX-350-370	Imperatorin	ALX-350-302
Baicalein	ALX-385-022	17-DMAG	ALX-380-110	Ingenol 3,20-dibenzoate	ALX-350-032
Betulinic acid (~95%)	ALX-350-298	Doxorubicin . HCl	ALX-380-042	Ionomycin (free acid)	ALX-450-006
Betulinic acid (high purity)	ALX-350-277	Echinomycin	ALX-380-201	Ionomycin . Ca	ALX-450-007
(+)-Brefeldin A	ALX-350-019	Echinosporin	ALX-380-115	Isoapoptolidin	ALX-380-229
Bufalin	ALX-350-281	Ellagic acid	ALX-270-262	Isorhamnetin	ALX-385-024
Caffeic acid phenylethyl ester	ALX-270-244	Elmetine . 2HCl	ALX-350-092	Isoxanthohumol	ALX-350-279
Caffeine	ALX-550-322	Emodin	ALX-350-057	Kaempferol	ALX-385-005

Lactacystin (native)	ALX-350-245	Oligomycin C	ALX-380-039	Tetracycline . HCl	ALX-380-060
Lactacystin (synthetic)	ALX-350-260	Parthenolide	ALX-350-258	Thapsigargin	ALX-350-004
Lupeol	ALX-350-355	PKC412	ALX-380-281	Thimerosal	ALX-400-013
Luteolin	ALX-385-007	Pseudolaric acid B	ALX-350-108	Triacsin C	ALX-380-285
Manumycin A	ALX-350-241	Puerarin	ALx-350-249	Trichostatin A	ALX-380-068
Minocycline . HCl	ALX-380-109	Puromycin . 2HCl	ALX-380-028	Triptolide	ALX-350-259
Mitomycin C	ALX-380-023	Quercetin	ALX-385-001	Tunicamycin	ALX-380-047
Monensin . Na	ALX-380-026	Resistomycin	ALX-380-111	UCN-01	ALX-380-222
Morin	ALX-385-016	Reveromycin A	ALX-380-216	UCN-02	ALX-380-206
Myriocin	ALX-350-274	Reveromycin B	ALX-380-217	Valinomycin	ALX-450-012
Myristicin	ALX-350-227	Reveromycin C	ALX-380-218	Vinblastine . sulfate	ALX-350-257
(±)-Naringenin	ALX-385-010	Reveromycin D	ALX-380-219	Vincristine . sulfate	ALX-350-069
Nidulal	ALX-350-110	Rocaglamide	ALX-350-121	Vindoline	ALX-350-102
n-Octylcaffeate	ALX-350-278	Rocaglaol	ALX-350-135	Wogonin	ALX-385-033
Okadaic acid (high purity)	ALX-350-003	Sanguinarine chloride	ALX-350-076	Wortmannin	ALX-350-020
Okadaic acid . ammonium salt	ALX-350-010	Sauchinone	ALX-350-116	WP631 . 2HCl	ALX-380-064
Okadaic acid . K	ALX-350-063	Staurosporine	ALX-380-014	WP631 . dimethanesulfonate	ALX-380-074
Okadaic acid . Na	ALX-350-011	DL-Sulforaphane	ALX-350-232	Xanthohumol	ALX-350-280
Oligomycin	ALX-380-037	L-Sulforaphane	ALX-350-230	Xanthorrhizol	ALX-350-263
Oligomycin A	ALX-380-036	T-2 Toxin	ALX-630-101		
Oligomycin B	ALX-380-038	Tautomycin	ALX-380-041		

ATPase Inhibitors

A23187 (free acid) [Calcimycin]	ALX-450-001	Cinobufotalin	ALX-350-284	Oligomycin A	ALX-380-036
17-AAG	ALX-380-091	Concanamycin A	ALX-380-034	Oligomycin B	ALX-380-038
Agelasine D	ALX-350-315	Concanamycin B	ALX-380-098	Oligomycin C	ALX-380-039
Apoptolidin	ALX-380-207	Concanamycin C	ALX-380-099	Ouabain	ALX-350-066
Bafilomycin A1	ALX-380-030	Cyclopiazonic acid	ALX-350-023	Proscillaridin A	ALX-350-285
Bafilomycin B1	ALX-380-063	Elaiophylin	ALX-380-212	Quercetin	ALX-385-001
Bafilomycin C1	ALX-380-209	Equisetin	ALX-350-322	Resibufogenin	ALX-350-286
Bufalin	ALX-350-281	Hellebrin	ALX-350-105	Sanguinarine chloride	ALX-350-076
Bufotalin	ALX-350-282	Mycalolide B	ALX-350-288	Tentoxin	ALX-350-132
Cinobufagin	ALX-350-283	Oligomycin	ALX-380-037	Thapsigargin	ALX-350-004

Cannabinoid / Vanilloid Receptor Modulators

Allicin	ALX-350-329	Eugenol (high purity)	ALX-350-123	4α-Phorbol 12,13-didecanoate	ALX-445-006
Cannabidiol	ALX-430-152	Evodiamine	ALX-350-330	PPAHV	ALX-550-355
Cannabigerol	ALX-430-154	5′-Iodo-resiniferatoxin	ALX-550-389	Resiniferatoxin (high purity)	ALX-550-179
(E)-Capsaicin	ALX-550-066	PDDHV	ALX-550-371	Resiniferonol 9,13,14-ortho-phenyl-acetate	ALX-350-074
Dihydrocapsaicin	ALX-350-052	PDNHV	ALX-550-372		

Cell Cycle / CDK Modulators

(+)-Aphidicolin	ALX-350-016	Indole-3-carbinol	ALX-350-347	Reveromycin A	ALX-380-216
Apicidin	ALX-350-095	Ionomycin (free acid)	ALX-450-006	Reveromycin B	ALX-380-217
3-ATA	ALX-350-273	Ionomycin . Ca	ALX-450-007	Reveromycin C	ALX-380-218
Baicalein	ALX-385-022	Leptomycin A	ALX-380-101	Reveromycin D	ALX-380-219
Borrelidin	ALX-380-102	Leptomycin B	ALX-380-100	Rifampicin	ALX-380-071
Caffeine	ALX-550-322	Leptomycin Set I	ALX-850-313	Staurosporine	ALX-380-014
Debromohymenialdisine	ALX-350-290	Leptomycin Set II	ALX-850-316	Tangeretin	ALX-385-027
Echinosporin	ALX-380-115	Malvidin chloride	ALX-385-013	Trichostatin A	ALX-380-068
Fascaplysin	ALX-270-300	Monensin . Na	ALX-380-026	Tryprostatin A	ALX-380-090
Ferulenol	ALX-350-124	Morin	ALX-385-016	UCN-01	ALX-380-222
Genistein	ALX-350-006	7-Oxostaurosporine	ALX-380-210	UCN-02	ALX-380-206
HC Toxin	ALX-630-102	Radicicol	ALX-380-092	Verruculogen	ALX-380-056
10Z-Hymenialdisine	ALX-350-289	Ratjadone A (synthetic)	ALX-270-346	Vinblastine . sulfate	ALX-350-257
Hymenidin	ALX-350-291	Ratjadone C (native)	ALX-270-369	Vincristine . sulfate	ALX-350-069

DNA/RNA Synthesis Inhibitors / DNA/RNA Polymerase Inhibitors

Actinomycin D	ALX-380-009	Bakuchiol	ALX-350-144	Mitomycin C	ALX-380-023
α-Amanitin	ALX-350-270	Blasticidin S . HCl	ALX-380-089	Neobavaisoflavone	ALX-350-146
β-Amanitin	ALX-350-271	Daunorubicin	ALX-380-043	Resistomycin	ALX-380-111
γ-Amanitin	ALX-350-272	Doxorubicin . HCl	ALX-380-042	Rifampicin	ALX-380-071
7-Amino-actinomycin D	ALX-380-283	Echinomycin	ALX-380-201	Sterigmatocystin	ALX-630-116
Angustmycin A	ALX-380-125	Emetine . 2HCl	ALX-350-092	Thiolutin	ALX-380-200
(+)-Aphidicolin	ALX-350-016	Hexaprenylhydroquinone	ALX-350-138	Xanthohumol	ALX-350-280
Aureothricin	ALX-380-240	Idarubicin . HCl	ALX-380-260		

Ecdysteroids

Ecdysone	ALX-370-011	Makisterone A	ALX-370-013	Ponasterone A	ALX-370-014
20-Hydroxyecdysone	ALX-370-012	Muristerone A	ALX-370-010		

Fatty Acid Synthase (FAS) Inhibitors

Cerulenin	ALX-380-053	Kaempferol	ALX-385-005	Orlistat	ALX-350-152
(-)-Epigallocatechin gallate	ALX-270-263	Luteolin	ALX-385-007	Quercetin	ALX-385-001

Flavonoids / Phenolic Acids / Stilbenoids

4′-Amino-6-hydroxyflavone	ALX-385-021	Diosmin	ALX-385-031	Nobiletin	ALX-385-026
Apigenin	ALX-385-008	(-)-Epigallocatechin gallate	ALX-270-263	n-Octylcaffeate	ALX-350-278
Baicalein	ALX-385-022	(R,S)-Equol	ALX-385-032	Pelargonidin chloride	ALX-385-014
Bavachin	ALX-350-147	Formononetin (high purity)	ALX-270-312	Peonidin chloride	ALX-385-015
4′-Bromoflavone	ALX-385-029	Gallotannin	ALX-270-418	Piceatannol	ALX-270-202
Butein	ALX-350-246	Genistein (synthetic)	ALX-350-006	Polydatin	ALX-350-114
Caffeic acid	ALX-270-231	Genistin	ALX-350-247	Puerarin	ALX-350-249
Caffeic acid phenylethyl ester	ALX-270-244	(±)-Hesperetin	ALX-385-011	Quercetin	ALX-385-001
Caffeic acid ethyl ester	ALX-270-480	Isobavachalcone	ALX-350-145	Resveratrol	ALX-270-125
(±)-Catechin	ALX-385-002	8-Isopentenylnaringenin	ALX-385-025	Rutin	ALX-460-028
(+)-Catechin	ALX-385-017	Isorhamnetin	ALX-385-024	Silybin	ALX-350-346
Chlorogenic acid	ALX-350-353	Isoxanthohumol	ALX-350-279	Tangeretin	ALX-385-027
Chrysin	ALX-385-009	Kaempferol	ALX-385-005	(+)-Taxifolin	ALX-385-018
Cinnamtannin	ALX-350-365	Luteolin	ALX-385-007	(±)-Taxifolin	ALX-385-006
Curcumin (high purity)	ALX-350-028	Malvidin chloride	ALX-385-013	*psi*-Tectorigenin	ALX-270-123
Cyanidin chloride	ALX-385-003	Methyl caffeate	ALX-350-226	Tiliroside	ALX-350-305
Daidzein	ALX-350-009	Morin	ALX-385-016	Trihydroxyethylrutin	ALX-385-030
Daidzin	ALX-350-248	Myricetin	ALX-385-012	*trans*-4,4′,5-Trimethoxy-stilbene	ALX-350-345
Delphinidin chloride	ALX-385-028	(±)-Naringenin	ALX-385-010	Wogonin	ALX-385-033
3,5-Di-O-caffeoylquinic acid	ALX-350-320	Neobavaisoflavone	ALX-350-146	Xanthohumol	ALX-350-280

Fruits and Vegetables - Active Substances

Allicin	ALX-350-329	Daidzein	ALX-350-009	Myristicin	ALX-350-227
L-(+)-Ascorbic acid	ALX-460-001	Daidzin	ALX-350-248	Myristicin, Dihydro-	ALX-350-222
Auraptene	ALX-350-361	Delphinidin chloride (high purity)	ALX-385-028	(±)-Naringenin	ALX-385-010
Cafestol	ALX-350-220	Dihydrocapsaicin	ALX-350-052	Nomilin	ALX-350-228
Caffeic acid	ALX-270-231	Diosmin	ALX-385-031	Pelargonidin chloride	ALX-385-014
Caffeine	ALX-550-322	(-)-Epigallocatechin gallate	ALX-270-263	Phloretin	ALX-270-113
3,5-Di-O-caffeoylquinic acid	ALX-350-320	Eugenol (high purity)	ALX-350-123	Quercetin	ALX-385-001
(+)-Calystegine B2	ALX-350-314	Folic acid	ALX-460-006	Resveratrol	ALX-270-125
Canavanine . sulfate	ALX-350-002	Formononetin (high purity)	ALX-270-312	Rosmarinic acid	ALX-270-253
(E)-Capsaicin	ALX-550-066	Genistein (synthetic)	ALX-350-006	Rutin	ALX-460-028
Carnosic acid	ALX-270-264	Genistin	ALX-350-247	Sedanolide	ALX-350-229
Carnosol	ALX-270-254	(±)-Hesperetin	ALX-385-011	DL-Sulforaphane	ALX-350-232
β-Carotene	ALX-460-004	8-Isopentenylnaringenin	ALX-385-025	L-Sulforaphane	ALX-350-230
(+)-Catechin	ALX-385-017	Isoxanthohumol	ALX-350-279	L-Sulforaphene	ALX-350-231
(±)-Catechin	ALX-385-002	Kaempferol	ALX-385-005	Tangeretin	ALX-385-027
Chlorogenic acid	ALX-350-353	Kahweol	ALX-350-223	Theobromine	ALX-480-061
Cinnamtannin B-1	ALX-350-365	Limonin	ALX-350-225	Theophylline	ALX-480-062
Curcumin (high purity)	ALX-350-028	Malvidin chloride	ALX-385-013	Xanthohumol	ALX-350-280
Cyanidin chloride	ALX-385-003	Myricetin	ALX-385-012		

Geldanamycin & Related Compounds (HSP90 Inhibitors)

17-AAG	ALX-380-091	Geldanamycin	ALX-380-054	Novobiocin . Na	ALX-380-093
17-DMAG	ALX-380-110	Herbimycin A	ALX-350-029	Radicicol	ALX-380-092

HIF Modulators

Apigenin	ALX-385-008	Chrysin	ALX-385-009	Xanthohumol	ALX-350-280
Artemisinin	ALX-350-219	Echinomycin	ALX-380-201		
Chetomin	ALX-350-128	Emetine . 2HCl	ALX-350-092		

Immunosuppressors / Immunomodulators

(-)-Arctigenin	ALX-350-312	Avarone	ALX-350-321	Bufotalin	ALX-350-282
(-)-Arctiin	ALX-350-318	Bavachin	ALX-350-147	Caffeic acid ethyl ester	ALX-270-480
Ascomycin	ALX-380-005	Bryostatin 1	ALX-350-005	Caffeic acid phenylethyl ester	ALX-270-244
Avarol	ALX-350-319	Bufalin	ALX-350-281	Canavanine . sulfate	ALX-350-002

Celastrol	ALX-350-332	α-Galactosylceramide	ALX-306-027	Rocaglamide	ALX-350-121
Chetomin	ALX-350-128	Gliotoxin	ALX-350-239	Rocaglamide AL	ALX-350-140
Cinobufagin	ALX-350-283	Hellebrin	ALX-350-105	Rocaglamide C	ALX-350-141
Cinobufotalin	ALX-350-284	Homoharringtonine	ALX-350-236	Rocaglamide I	ALX-350-142
Concanamycin C	ALX-380-099	Loganin	ALX-350-363	Rocaglamide J	ALX-350-143
Conglobatin	ALX-380-225	Margatoxin	ALX-630-045	Rocaglaol	ALX-350-135
Cyclosporin A	ALX-380-002	Mithramycin A	ALX-380-097	β-Rubromycin	ALX-380-067
Cyclosporin C	ALX-380-282	Monactin	ALX-380-214	Stachybotrylactam	ALX-630-112
Cyclosporin D	ALX-380-284	Mycophenolic acid	ALX-380-015	Stichodactyla Toxin	ALx-630-044
Cyclosporin H	ALX-380-286	Myriocin	ALX-350-274	Sulochrin	ALX-380-221
Daunorubicin . HCl	ALX-380-043	Nomilin	ALX-350-228	Trinactin	ALX-380-238
Dinactin	ALX-380-226	n-Octylcaffeate	ALX-350-278	Triptolide	ALX-350-259
Doxorubicin . HCl	ALX-380-042	Proscillaridin A	ALX-350-285	Troleandomycin	ALX-380-001
Elaiophylin	ALX-380-212	Rapamycin	ALX-380-004	Withaferin A	ALX-350-153
FK506	ALX-380-008	Resibufogenin	ALX-350-286		

Inflammation

3-O-Acetyl-β-boswellic acid	ALX-350-308	Diosmin	ALX-385-031	n-Octylcaffeate	ALX-350-278
3-O-Acetyl-11-keto-β-boswellic acid	ALX-350-310	Emodin	ALX-350-057	Panepoxydone	ALX-350-109
Angoroside C	ALX-350-331	(-)-Epigallocatechin gallate	ALX-270-263	Parthenolide	ALX-350-258
(-)-Arctigenin	ALX-350-312	Erythromycin	ALX-380-274	Peonidin chloride	ALX-385-015
Ascochlorin	ALX-350-334	Formononetin (high purity)	ALX-270-312	Quercetin	ALX-385-001
Astaxanthin (crystalline)	ALX-460-031	Harpagoside	ALX-350-333	Rosmarinic acid	ALX-270-253
Auraptene	ALX-350-361	(±)-Hesperetin	ALX-385-011	S14-95	ALX-350-299
Baicalein	ALX-385-022	Hyperforin . DCHA (high purity)	ALX-350-097	Sanguinarine chloride	ALX-350-076
Berberine . hemisulfate	ALX-350-094	Ilimaquinone	ALX-350-240	Silybin	ALX-350-346
Betulinic acid (~95%)	ALX-350-298	Kahweol	ALX-350-223	(+)-Taxifolin	ALX-385-018
Betulinic acid (high purity)	ALX-350-277	Luffariellolide	ALX-350-038	Tetracycline . HCl	ALX-380-060
Butein	ALX-350-246	Lupeol	ALX-350-355	Thielavin A	ALX-350-339
Caffeic acid	ALX-270-231	Manoalide	ALX-350-045	Thielavin B	ALX-350-340
Caffeic acid ethyl ester	ALX-270-480	Manzamine A	ALX-350-294	Tiliroside	ALX-350-305
Caffeic acid phenylethyl ester	ALX-270-244	MCD Peptide	ALX-162-002	Trichodion	ALX-350-261
Caffeine	ALX-550-322	Minocycline . HCl	ALX-380-109	Triptolide	ALX-350-259
Carnosic acid	ALX-270-264	Morin	ALX-385-016	Tryptanthrin	ALX-270-360
Celastrol	ALX-350-332	Myricetin	ALX-385-012	Tylophorine	ALX-350-154
Chrysin	ALX-385-009	(±)-Naringenin	ALX-385-010	Withaferin A	ALX-350-153
Compound A (see Page 96)	ALX-550-516	Nobiletin	ALX-385-026	Wogonin	ALX-385-033
Curcumin (high purity)	ALX-350-028	Nordihydroguaiaretic acid [NDGA]	ALX-350-086	Xanthorrhizol	ALX-350-263
Daidzein	ALX-350-009	Novobiocin . Na	ALX-380-093		

Ionophores

A23187 (free acid) [Calcimycin]	ALX-450-001	Ferutinin (high purity)	ALX-350-098	Nonactin	ALX-450-008
A23187 (Mixed Calcium-Magnesium Salt)	ALX-450-002	Ionomycin (free acid)	ALX-450-006	Trinactin	ALX-380-238
Alamethicin	ALX-380-046	Ionomycin . Ca	ALX-450-007	Valinomycin	ALX-450-012
4-Bromo-A23187	ALX-450-003	Monactin	ALX-380-214	X-206	ALX-380-087
Dinactin	ALX-380-226	Monensin . Na	ALX-380-026		
Enniatin B	ALX-380-007	Nigericin . Na	ALX-380-050		

Microcystins

Hepatotox Set™ 1	ALX-850-325	Microcystin-LW	ALX-350-080	Microcystins (Adda specific) ELISA Kit	ALX-850-319
Microcystin-LA	ALX-350-096	Microcystin-LY	ALX-350-148	Microcystins-DM ELISA Kit	ALX-850-324
Microcystin-LF	ALX-350-081	Microcystin-RR	ALX-350-043	Nodularin	ALX-350-061
Microcystin-LR	ALX-350-012	Microcystin-YR	ALX-350-044		

Microtubule Modulators / Cytoskeletal Research

α-Amanitin	ALX-350-270	Cytochalasin C	ALX-380-069	Phalloidin (FITC)	ALX-350-268
β-Amanitin	ALX-350-271	Cytochalasin D	ALX-380-031	Phalloidin, Amino-, . HCl	ALX-350-266
γ-Amanitin	ALX-350-272	Cytochalasin E	ALX-380-062	Podophyllotoxin	ALX-630-086
Ascochlorin	ALX-350-334	Hurghadolide A	ALX-350-357	Rotenone	ALX-350-360
Baccatin III, 10-Deacetyl-	ALX-351-006	Latrunculin A	ALX-350-130	Swinholide A	ALX-350-088
Bistheonellide A	ALX-350-287	Latrunculin B	ALX-350-036	Swinholide I	ALX-350-356
Catharanthine . tartrate	ALX-350-101	Mycalolide B	ALX-350-288	Tryprostatin A	ALX-380-090
Colcemid	ALX-430-033	Paclitaxel	ALX-351-001	Vinblastine . sulfate	ALX-350-257
Colchicine	ALX-380-033	Pectenotoxin-2	ALX-350-369	Vincristine . sulfate	ALX-350-069
Cytochalasin A	ALX-380-057	Phallacidin	ALX-350-269	Vindoline	ALX-350-102
Cytochalasin B [Phomin]	ALX-380-012	Phalloidin	ALX-350-265	Withaferin A	ALX-350-153
Cytochalasin B, Dihydro-	ALX-350-053	Phalloidin (Biotin)	ALX-350-267		

Molecular Biology

G418 . sulfate	ALX-380-013	Hygromycin B (liquid)	ALX-380-059	Thimerosal	ALX-400-013
Gelonin	ALX-350-150	Puromycin . 2HCl	ALX-380-028		
Gentamicin sulfate	ALX-380-003	Puromycin aminonucleoside	ALX-480-083		

Multidrug Resistance Modulators

Butein	ALX-350-246	Josamycin	ALX-380-078	Silybin	ALX-350-346
Cafestol	ALX-350-220	Kahweol	ALX-350-223	Sipholenol A	ALX-350-358
(S)-(+)-Camptothecin	ALX-350-015	Mithramycin	ALX-380-097	DL-Sulforaphane	ALX-350-232
Curcumin (high purity)	ALX-350-028	Myristicin	ALX-350-227	L-Sulforaphane	ALX-350-230
Diosmin	ALX-385-031	Myristicin, Dihydro-	ALX-350-222	Tryprostatin A	ALX-380-090
Enniatin B	ALX-380-007	Nonactin	ALX-450-008	WP631 . 2HCl	ALX-380-064
Evodiamine	ALX-350-330	Ophiobolin A	ALX-270-109	WP631 . dimethanesulfonate	ALX-380-074
Fumitremorgin C	ALX-350-127	Sedanolide	ALX-350-229		

Mycotoxins

Aflatoxin B1	ALX-630-093	Deoxynivalenol	ALX-630-115	Paxilline	ALX-630-019
Aflatoxin B2	ALX-630-103	Fumigaclavine A	ALX-630-110	Penitrem A	ALX-630-020
Aflatoxin G1	ALX-630-104	Fumitremorgin C	ALX-350-127	Roquefortine C	ALX-350-342
Aflatoxin G2	ALX-630-106	Fumonisin B1	ALX-350-017	Stachybotrylactam	ALX-630-112
Aflatoxin M1	ALX-630-095	Fumonisin B2	ALX-350-237	Sterigmatocystin	ALX-630-116
Aflatoxin M2	ALX-630-114	Gliotoxin	ALX-350-239	T-2 Toxin	ALX-630-101
Alternariol	ALX-350-139	HT-2 Toxin	ALX-630-113	Tenuazonic acid	ALX-350-317
Citrinin	ALX-380-058	Moniliformin . Na	ALX-630-111	Zearalenone	ALX-630-105
Cyclopiazonic acid	ALX-350-023	Ochratoxin A	ALX-630-089		
Cytochalasin A	ALX-380-057	Patulin	ALX-270-111		

Neurobiology Compounds / Neurotoxins

Aconitine	ALX-550-232	Gonyautoxin 2/3 Epimers	ALX-350-307	Okadaic acid . K	ALX-350-063
Agelongine	ALX-350-326	Herbimycin A	ALX-350-029	Okadaic acid . Na	ALX-350-011
Anabasine . HCl	ALX-350-112	(+)-Himbacine	ALX-550-061	Paxilline	ALX-630-019
α-Bungarotoxin	ALX-630-075	Honokiol	ALX-350-350	PDDHV	ALX-550-371
β-Bungarotoxin	ALX-630-050	HT-2 Toxin	ALX-630-113	PDNHV	ALX-550-372
Caffeine	ALX-550-322	(-)-Huperzine A	ALX-550-065	Penitrem A	ALX-630-020
Cannabidiol	ALX-430-152	Hymenidin	ALX-350-291	Pertussis Toxin	ALX-630-003
Cannabigerol	ALX-430-154	Hyperforin . DCHA (high purity)	ALX-350-097	Pertussis Toxin A Protomer	ALX-630-080
(E)-Capsaicin	ALX-550-066	Hypericin (native)	ALX-350-030	Pertussis Toxin B Oligomer	ALX-630-081
Charybdotoxin	ALX-630-059	Iberiotoxin	ALX-630-058	4α-Phorbol 12,13-didecanoate	ALX-445-006
Chlorogenic acid	ALX-350-353	Iberiotoxin (recombinant)	ALX-630-097	(+)-Pilocarpine . HCl	ALX-550-092
Chlorotoxin	ALX-630-069	5′-Iodo-resiniferatoxin	ALX-550-389	Pimprinine	ALX-380-234
α-Conotoxin GI	ALX-630-046	6′-Iodononivamide	ALX-350-122	PPAHV	ALX-550-355
α-Conotoxin MI	ALX-630-048	Joro Spider Toxin	ALX-630-077	Pseudohypericin	ALX-350-276
α-Conotoxin SI	ALX-630-049	Kaliotoxin	ALX-630-085	Puerarin	ALX-350-249
μ-Conotoxin GIIIB	ALX-630-054	Kaliotoxin (1-37)	ALX-630-041	Quinine . hemisulfate	ALX-550-292
μ-Conotoxin GS	ALX-630-047	Kuanoniamine C	ALX-350-262	Resiniferatoxin (high purity)	ALX-550-179
ω-Conotoxin GVIA	ALX-630-055	α-Latrotoxin	ALX-630-027	Resiniferonol 9,13,14-ortho-phenylacetate	ALX-350-074
ω-Conotoxin MVIIA	ALX-630-056	Limonin	ALX-350-225		
ω-Conotoxin MVIIC	ALX-630-057	Lobeline . HCl	ALX-420-023	Roquefortine C	ALX-350-342
ω-Conotoxin SVIB	ALX-630-053	Magnolol	ALX-350-352	Ryanodine (high purity)	ALX-630-062
Cyclopiazonic acid	ALX-350-023	Margatoxin	ALX-630-045	Sceptrin . 2HCl	ALX-350-264
L-Cycloserine	ALX-106-037	Mastoparan	ALX-162-001	(-)-Scopolamine . HBr	ALX-550-094
D-Cycloserine	ALX-106-028	(-)-Menthol	ALX-420-042	Scyllatoxin	ALX-630-043
Cylindrospermopsin	ALX-350-149	MCD Peptide	ALX-162-002	Spectinomycin . 2HCl	ALX-380-278
Dihydrocapsaicin	ALX-350-052	Minocycline . HCl	ALX-380-109	Stichodactyla Toxin	ALX-630-044
Domoic acid	ALX-550-152	Neomycin sulfate	ALX-380-035	Tetrodotoxin (citrate free)	ALX-630-002
(-)-Eburnamonine	ALX-350-216	Neurotoxin NSTX-3	ALX-630-087	Theobromine	ALX-480-061
Emetine . 2HCl	ALX-350-092	Nonivamide	ALX-550-239	Trifluoperazine . 2HCl	ALX-550-310
Eugenol (high purity)	ALX-350-123	Ochratoxin A	ALX-630-089	(+)-Tubocurarine . dichloride	ALX-550-182
Evodiamine	ALX-350-330	Okadaic acid (high purity)	ALX-350-003	Veratridine	ALX-550-307
Galanthamine . HBr	ALX-550-336	Okadaic acid . ammonium salt	ALX-350-010	Verruculogen	ALX-380-056

NF-κB Pathway Modulators

3-O-Acetyl-11-keto-β-boswellic acid	ALX-350-310	Celastrol	ALX-350-332	Lactacystin (synthetic)	ALX-350-260
3-O-Acetyl-β-boswellic acid	ALX-350-308	Emodin	ALX-350-057	Morin	ALX-385-016
Betulinic acid (~95%)	ALX-350-298	Erythromycin	ALX-380-274	Myricetin	ALX-385-012
Betulinic acid (high purity)	ALX-350-277	FK506	ALX-380-008	Nobiletin	ALX-385-026
Caffeic acid ethyl ester	ALX-270-480	Gliotoxin	ALX-350-239	n-Octylcaffeate	ALX-350-278
Caffeic acid phenylethyl ester	ALX-270-244	10Z-Hymenialdisine	ALX-350-289	Oxaspirodion	ALX-350-301
Carnosol	ALX-270-254	Lactacystin (native)	ALX-350-245	Panepoxydone	ALX-350-109

Parthenolide	ALX-350-258	Rocaglamide C	ALX-350-141	Sauchinone	ALX-350-116
Radicicol	ALX-380-092	Rocaglamide I	ALX-350-142	Triptolide	ALX-350-259
Rocaglamide	ALX-350-121	Rocaglamide J	ALX-350-143	Withaferin A	ALX-350-153
Rocaglamide AL	ALX-350-140	Rocaglaol	ALX-350-135		

Nitric Oxide Pathway Modulators

(+)-*cis*,*trans*-Abscisic acid	ALX-350-255	(-)-Epigallocatechin gallate	ALX-270-263	PKC412	ALX-380-281
Allicin	ALX-350-329	Evodiamine	ALX-350-330	Quercetin	ALX-385-001
(-)-Arctigenin	ALX-350-312	Forskolin	ALX-350-001	Radicicol	ALX-380-092
Artemisinin	ALX-350-219	Fusidic acid . Na	ALX-380-011	Rutin	ALX-460-028
Bakuchiol	ALX-350-144	Gallotannin	ALX-270-418	S14-95	ALX-350-299
Caffeic acid ethyl ester	ALX-270-480	Harpagoside	ALX-350-333	Sauchinone	ALX-350-116
(S)-(+)-Camptothecin	ALX-350-015	Honokiol	ALX-350-350	Streptozotocin	ALX-380-010
Canavanine . sulfate	ALX-350-002	10Z-Hymenialdisine	ALX-350-289	Thapsigargin	ALX-350-004
Carnosol	ALX-270-254	Iromycin A	ALX-380-124	Tiliroside	ALX-350-305
Celastrol	ALX-350-332	Lavendustin A	ALX-350-007	Trichodion	ALX-350-261
Ceruloplasmin	ALX-200-089	Magnolol	ALX-350-352	Troleandomycin	ALX-380-001
Concanamycin A	ALX-380-034	Minocycline . HCl	ALX-380-109	Tryptanthrin	ALX-270-360
Curcumin (high purity)	ALX-350-028	Mycophenolic acid	ALX-380-015	Wogonin	ALX-385-033
Cyanidin chloride	ALX-385-003	Nobiletin	ALX-385-026	Wortmannin	ALX-350-020
Cyclosporin A	ALX-380-002	n-Octylcaffeate	ALX-350-278		
Delphinidin chloride	ALX-385-028	Pelargonidin chloride	ALX-385-014		

Phorbols / Phorbol Esters

Croton oil	ALX-350-089	Phorbol 12,13-diacetate	ALX-445-003	4α-Phorbol 12-myristate 13-acetate	ALX-445-005
12-Deoxyphorbol 13-acetate	ALX-445-009	Phorbol 12,13-dibutyrate	ALX-445-001	Phorbol 13-acetate	ALX-445-028
12-Deoxyphorbol 13-phenylacetate	ALX-445-049	4α-Phorbol 12,13-dibutyrate	ALX-445-038	Phorbol 13-myristate	ALX-445-044
20-Oxo-20-deoxyphorbol 12,13-dibutyrate	ALX-445-020	Phorbol 12,13-didecanoate	ALX-445-002	PPAHV	ALX-550-355
PDDHV	ALX-550-371	4α-Phorbol 12,13-didecanoate	ALX-445-006	Sapintoxin D (high purity)	ALX-445-047
PDNHV	ALX-550-372	Phorbol 12-myristate 13-acetate	ALX-445-004		

Phosphatase Inhibitors

Ascomycin	ALX-380-005	Microcystin-LR	ALX-350-012	Nodularin	ALX-350-061
Bakuchiol	ALX-350-144	Microcystin-LW	ALX-350-080	Okadaic acid (high purity)	ALX-350-003
Cantharidin	ALX-270-063	Microcystin-LY	ALX-350-148	Okadaic acid . ammonium salt	ALX-350-010
FK506	ALX-380-008	Microcystin-RR	ALX-350-043	Okadaic acid . K	ALX-350-063
Hepatotox Set™ 1	ALX-850-325	Microcystin-YR	ALX-350-044	Okadaic acid . Na	ALX-350-011
Microcystin-LA	ALX-350-096	Microcystins (Adda specific) ELISA Kit	ALX-850-319	Psoralidin	ALX-350-323
Microcystin-LF	ALX-350-081	Microcystins-DM ELISA Kit	ALX-850-324	RK-682	ALX-380-205

PKC Inhibitors

Calphostin C	ALX-350-027	Melittin (natural)	ALX-162-006	Quercetin	ALX-385-001
Chelerythrine chloride	ALX-350-008	Melittin (synthetic)	ALX-162-007	Rottlerin	ALX-350-075
(-)-Epigallocatechin gallate	ALX-270-263	7-Oxostaurosporine	ALX-380-210	Staurosporine	ALX-380-014
Hypericin (native)	ALX-350-030	Phloretin	ALX-270-113	UCN-01	ALX-380-222
K-252a	ALX-380-027	PKC412	ALX-380-281	UCN-02	ALX-380-206
K-252b	ALX-380-029	Polymyxin B . sulfate	ALX-380-040		
K-252c	ALX-380-103	Pseudohypericin	ALX-350-276		

Proteasome / Ubiquitin Modulators

Betulinic acid (~95%)	ALX-350-298	Epoxomicin	ALX-350-254	Lactacystin (native)	ALX-350-245
Betulinic acid (high purity)	ALX-350-277	Hypothemycin	ALX-380-116	Lactacystin (synthetic)	ALX-350-260
Celastrol	ALX-350-332	Kendomycin	ALX-380-066	*clasto*-Lactacystin β-lactone (synthetic)	ALX-270-280

Protein Kinase Inhibitors

3-O-Acetyl-11-keto-β-boswellic acid	ALX-350-310	Deguelin	ALX-350-118	K-252c	ALX-380-103
3-O-Acetyl-β-boswellic acid	ALX-350-308	Emodin	ALX-350-057	Lavendustin A	ALX-350-007
(+)-Aeroplysinin-1	ALX-350-256	(-)-Epigallocatechin gallate	ALX-270-263	Lavendustin A methyl ester	ALX-350-091
Apigenin	ALX-385-008	Geldanamycin	ALX-380-054	Lavendustin B	ALX-350-037
Baicalein	ALX-385-022	Genistein (synthetic)	ALX-350-006	Lavendustin C	ALX-270-066
Butein	ALX-350-246	Genistin	ALX-350-247	Lavendustin C methyl ester	ALX-350-084
Caffeic acid phenylethyl ester	ALX-270-244	Herbimycin A	ALX-350-029	LL-Z1640-2	ALX-380-267
Calphostin C	ALX-350-027	10Z-Hymenialdisine	ALX-350-289	Melittin (natural)	ALX-162-006
Chelerythrine chloride	ALX-350-008	Hypericin (native)	ALX-350-030	Melittin (synthetic)	ALX-162-007
Curcumin (high purity)	ALX-350-028	Hypothemycin	ALX-380-116	Methyl caffeate	ALX-350-226
Daidzein	ALX-350-009	K-252a	ALX-380-027	Nobiletin	ALX-385-026
Debromohymenialdisine	ALX-350-290	K-252b	ALX-380-029	7-Oxostaurosporine	ALX-380-210

Parthenolide	ALX-350-258	Quercetin	ALX-385-001	Staurosporine	ALX-380-014
Phloretin	ALX-270-113	Radicicol	ALX-380-092	*psi*-Tectorigenin	ALX-270-123
Piceatannol	ALX-270-202	Rapamycin	ALX-380-004	UCN-01	ALX-380-222
PKC412	ALX-380-281	Rottlerin	ALX-350-075	UCN-02	ALX-380-206
Polymyxin B . sulfate	ALX-380-040	S14-95	ALX-350-299	Wortmannin	ALX-350-020
Pseudohypericin	ALX-350-276	Silybin	ALX-350-346		

Protein Synthesis Inhibitors

α-Amanitin	ALX-350-270	Erythromycin	ALX-380-274	Novobiocin . Na	ALX-380-093
β-Amanitin	ALX-350-271	Fusidic acid . Na	ALX-380-011	Spectinomycin . 2HCl	ALX-380-278
γ-Amanitin	ALX-350-272	Gelonin	ALX-350-150	Streptomycin . sulfate	ALX-380-277
Blasticidin S . HCl	ALX-380-089	Hygromycin B	ALX-380-059	Tenuazonic acid	ALX-350-317
Chlortetracycline . HCl	ALX-350-238	Kanamycin . sulfate	ALX-380-049	Tetracycline . HCl	ALX-380-060
Cycloheximide	ALX-380-269	Kasugamycin . HCl	ALX-380-076	Thiostrepton	ALX-380-261
Cylindrospermopsin	ALX-350-149	Lincomycin . HCl	ALX-380-276		
Deoxynivalenol	ALX-630-115	Mithramycin A	ALX-380-097		

Signal Transduction - Other Pathway Modulators

Ampullosporin A	ALX-350-106	(R,S)-Equol	ALX-385-032	Papaverine . HCl	ALX-270-110
Anisomycin	ALX-380-051	Forskolin	ALX-350-001	Patulin	ALX-270-111
Aristolochic acid	ALX-270-047	Fostriecin	ALX-380-065	Pentoxifylline	ALX-270-112
Australine . HCl	ALX-270-157	Galiellalactone	ALX-350-336	Psoralidin	ALX-350-323
Azaspiracid-1	ALX-350-366	Gramicidin A (high purity)	ALX-350-233	L-Quebrachitol	ALX-307-001
Azaspiracid-2	ALX-350-367	Harmine	ALX-350-371	Quinidine . sulfate	ALX-550-291
Azaspiracid-3	ALX-350-368	Ilimaquinone	ALX-350-240	Resiniferatoxin (high purity)	ALX-550-179
Bakuchiol	ALX-350-144	Ingenol (high purity)	ALX-350-031	Resiniferonol 9,13,14-ortho-phenyl-acetate	ALX-350-074
Bryostatin 1	ALX-350-005	Isotetrandrine	ALX-350-035	Reticulol	ALX-380-118
Caffeine	ALX-550-322	Isoxanthohumol	ALX-350-279	RK-682	ALX-380-205
Calyculin A	ALX-350-014	Kendomycin	ALX-380-066	Ryanodine (high purity)	ALX-630-062
(+)-Calystegine B2	ALX-350-314	Luffariellolide	ALX-350-038	12-*epi*-Scalaradial	ALX-350-234
Castanospermine	ALX-270-160	(+)-Madindoline A	ALX-350-328	Stellettamide A . 3TFA	ALX-350-311
Decoyinine	ALX-380-032	Manoalide	ALX-350-045	Tautomycin	ALX-380-041
Deoxygalactonojirimycin . HCl	ALX-580-001	Manumycin A	ALX-350-241	Theophylline, 7-(β-Hydroxyethyl)-	ALX-480-067
1-Deoxymannojirimycin . HCl	ALX-580-002	Mezerein (high purity)	ALX-350-042	Thimerosal	ALX-400-013
1-Deoxynojirimycin	ALX-580-003	Neomycin sulfate	ALX-380-035	Trichostatin A	ALX-380-068
Egenine	ALX-350-362	Novobiocin . Na	ALX-380-093		
EM574 [Motilide]	ALX-380-264	Ophiobolin A	ALX-270-109		
Enniatin B	ALX-380-007	Ophiobolin B	ALX-350-338		

Staurosporine & Related Compounds

K-252a	ALX-380-027	KT5823	ALX-270-087	UCN-01	ALX-380-222
K-252b	ALX-380-029	7-Oxostaurosporine	ALX-380-210	UCN-02	ALX-380-206
K-252c	ALX-380-103	PKC412	ALX-380-281		
KT5720	ALX-270-075	Staurosporine	ALX-380-014		

Topoisomerase Inhibitors

3-O-Acetyl-11-keto-β-boswellic acid	ALX-350-310	Daunorubicin . HCl	ALX-380-043	Novobiocin . Na	ALX-380-093
3-O-Acetyl-β-boswellic acid	ALX-350-308	Doxorubicin . HCl	ALX-380-042	Podophyllotoxin	ALX-630-086
(-)-Arctigenin	ALX-350-312	Ellagic acid	ALX-270-262	Proscillaridin A	ALX-350-285
(-)-Arctiin	ALX-350-318	Etoposide	ALX-270-209	Radicicol	ALX-380-092
Bakuchiol	ALX-350-144	Fostriecin	ALX-380-065	Rebeccamycin	ALX-380-079
Becatecarin	ALX-380-119	Genistein (synthetic)	ALX-350-006	Reticulol	ALX-380-118
(S)-(+)-Camptothecin	ALX-350-015	Genistin	ALX-350-247	Sedanolide	ALX-350-229
Chartreusin	ALX-380-073	Idarubicin . HCl	ALX-380-260	Topotecan . HCl	ALX-350-133
Chrysomycin A	ALX-380-112	Irinotecan . HCl	ALX-430-139	UK-1	ALX-380-117
Chrysomycin B	ALX-380-114	Neobavaisoflavone	ALX-350-146		

Toxins

Aaptamine	ALX-350-104	α-Amanitin	ALX-350-270	Chlorotoxin	ALX-630-069
Aconitine	ALX-550-232	β-Amanitin	ALX-350-271	Citrinin	ALX-380-058
Adenylate Cyclase Toxin	ALX-630-088	γ-Amanitin	ALX-350-272	α-Conotoxin GI	ALX-630-046
Aflatoxin B1	ALX-630-093	Aristolochic acid	ALX-270-047	α-Conotoxin MI	ALX-630-048
Aflatoxin B2	ALX-630-103	Azaspiracid-1	ALX-350-366	α-Conotoxin SI	ALX-630-049
Aflatoxin G1	ALX-630-104	Azaspiracid-2	ALX-350-367	μ-Conotoxin GIIIB	ALX-630-054
Aflatoxin G2	ALX-630-106	Azaspiracid-3	ALX-350-368	μ-Conotoxin GS	ALX-630-047
Aflatoxin M1	ALX-630-095	α-Bungarotoxin	ALX-630-075	ω-Conotoxin GVIA	ALX-630-055
Aflatoxin M2	ALX-630-114	β-Bungarotoxin	ALX-630-050	ω-Conotoxin MVIIA	ALX-630-056
ω-Agatoxin IVA	ALX-630-001	(E)-Capsaicin	ALX-550-066	ω-Conotoxin MVIIC	ALX-630-057
Alternariol	ALX-350-139	Charybdotoxin	ALX-630-059	ω-Conotoxin SVIB	ALX-630-053

Convulxin	ALX-350-100	Latrunculin B	ALX-350-036	Pertussis Toxin B Oligomer	ALX-630-081
Cyclopiazonic acid	ALX-350-023	16-*epi*-Latrunculin B	ALX-350-359	Phallacidin	ALX-350-269
Cylindrospermopsin	ALX-350-149	Margatoxin	ALX-630-045	Phalloidin	ALX-350-265
Cytochalasin A	ALX-380-057	Mastoparan	ALX-162-001	Phalloidin (Biotin)	ALX-350-267
Deoxynivalenol	ALX-630-115	MCD Peptide	ALX-162-002	Phalloidin (FITC)	ALX-350-268
Dihydrocapsaicin	ALX-350-052	Microcystin-LA	ALX-350-096	Phalloidin, Amino-, . HCl	ALX-350-266
Domoic acid	ALX-550-152	Microcystin-LF	ALX-350-081	Podophyllotoxin	ALX-630-086
Doxorubicin . HCl	ALX-380-042	Microcystin-LR	ALX-350-012	Resiniferatoxin (high purity)	ALX-550-179
Emetine . 2HCl	ALX-350-092	Microcystin-LW	ALX-350-080	Roquefortine C	ALX-350-342
Emodin	ALX-350-057	Microcystin-LY	ALX-350-148	Rotenone	ALX-350-360
Enniatin B	ALX-380-007	Microcystin-RR	ALX-350-043	Rubellin D	ALX-350-324
Etoposide	ALX-270-209	Microcystin-YR	ALX-350-044	Ryanodine (high purity)	ALX-630-062
Fumigaclavine A	ALX-630-110	Microcystins (Adda specific) ELISA Kit	ALX-850-319	Sapintoxin D (high purity)	ALX-445-047
Fumitremorgin C	ALX-350-127	Microcystins-DM ELISA Kit	ALX-850-324	Sarafotoxin S6b	ALX-167-001
Fumonisin B1	ALX-350-017	Moniliformin . Na	ALX-630-111	Sarafotoxin S6c	ALX-167-002
Fumonisin B2	ALX-350-237	Neurotoxin NSTX-3	ALX-630-087	Scyllatoxin	ALX-630-043
Gliotoxin	ALX-350-239	Nodularin	ALX-350-061	Stachybotrylactam	ALX-630-112
Gonyautoxin 2/3 Epimers	ALX-350-307	Nonivamide	ALX-550-239	Sterigmatocystin	ALX-630-116
HC Toxin	ALX-630-102	Ochratoxin A	ALX-630-089	Stichodactyla Toxin	ALX-630-044
Hepatotox Set™ 1	ALX-850-325	Okadaic acid (high purity)	ALX-350-003	T-2 Toxin	ALX-630-101
Herbimycin A	ALX-350-029	Okadaic acid . ammonium salt	ALX-350-010	Tentoxin	ALX-350-132
HT-2 Toxin	ALX-630-113	Okadaic acid . K	ALX-350-063	Tenuazonic acid	ALX-350-317
Iberiotoxin	ALX-630-058	Okadaic acid . Na	ALX-350-011	Tetrodotoxin (citrate free)	ALX-630-002
Iberiotoxin (recombinant)	ALX-630-097	Ophiobolin A	ALX-270-109	Thaxtomin A	ALX-630-109
6′-Iodononivamide	ALX-350-122	Patulin	ALX-270-111	Toxin A, from Clostridium difficile	ALX-630-100
Joro Spider Toxin	ALX-630-077	Paxilline	ALX-630-019	Trifluoperazine . 2HCl	ALX-550-310
Kaliotoxin	ALX-630-085	Pectenotoxin-2	ALX-350-369	(+)-Tubocurarine . dichloride	ALX-550-182
Kaliotoxin (1-37)	ALX-630-041	Penitrem A	ALX-630-020	Veratridine	ALX-550-307
α-Latrotoxin	ALX-630-027	Pertussis Toxin	ALX-630-003	Verruculogen	ALX-380-056
Latrunculin A	ALX-350-130	Pertussis Toxin A Protomer	ALX-630-080	Zearalenone	ALX-630-105

Tumor Promoters

Aflatoxin B1	ALX-630-093	Mezerein (high purity)	ALX-350-042	PDDHV	ALX-550-371
Aflatoxin B2	ALX-630-103	Microcystin-LA	ALX-350-096	PDNHV	ALX-550-372
Aflatoxin G1	ALX-630-104	Microcystin-LF	ALX-350-081	Phorbol 12,13-diacetate	ALX-445-003
Aflatoxin G2	ALX-630-106	Microcystin-LR	ALX-350-012	Phorbol 12,13-dibutyrate	ALX-445-001
Aflatoxin M1	ALX-630-095	Microcystin-LW	ALX-350-080	4α-Phorbol 12,13-dibutyrate	ALX-445-038
Aflatoxin M2	ALX-630-114	Microcystin-LY	ALX-350-148	Phorbol 12,13-didecanoate	ALX-445-002
(+)-Aphidicolin	ALX-350-016	Microcystin-RR	ALX-350-043	4α-Phorbol 12,13-didecanoate	ALX-445-006
Aristolochic acid	ALX-270-047	Microcystin-YR	ALX-350-044	Phorbol 12-myristate 13-acetate	ALX-445-004
Calyculin A	ALX-350-014	Microcystins (Adda specific) ELISA Kit	ALX-850-319	4α-Phorbol 12-myristate 13-acetate	ALX-445-005
Croton oil	ALX-350-089	Microcystins-DM ELISA Kit	ALX-850-324	Phorbol 13-acetate	ALX-445-028
12-Deoxyphorbol 13-acetate	ALX-445-009	Nodularin	ALX-350-061	Phorbol 13-myristate	ALX-445-044
12-Deoxyphorbol 13-phenylacetate	ALX-445-049	Okadaic acid (high purity)	ALX-350-003	PPAHV	ALX-550-355
Fumonisin B1	ALX-350-017	Okadaic acid . ammonium salt	ALX-350-010	Sapintoxin D (high purity)	ALX-445-047
Fumonisin B2	ALX-350-237	Okadaic acid . K	ALX-350-063	Thapsigargin	ALX-350-004
Hepatotox Set™ 1	ALX-850-325	Okadaic acid . Na	ALX-350-011		
Ingenol 3,20-dibenzoate	ALX-350-032	20-Oxo-20-deoxyphorbol 12,13-dibutyrate	ALX-445-020		

Vitamins & Coenzymes

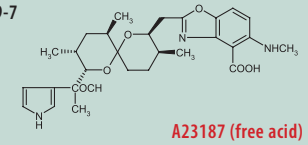
Alfacalcidol	ALX-460-036	NADP . 2Na	ALX-480-003	DL-α-Tocopherol (high purity)	ALX-460-018
L-(+)-Ascorbic acid	ALX-460-001	NADPH . 4Na	ALX-480-004	DL-α-Tocopherol . acetate	ALX-460-019
D-(+)-Biotin	ALX-460-002	Nicotinamide	ALX-460-008	Ubiquinone-10	ALX-270-295
Calcitriol	ALX-460-032	Nicotinic acid	ALX-460-009	Ubiquinone-5	ALX-270-294
Calcium D-(+)-pantothenate	ALX-460-003	Pyridoxal . HCl	ALX-460-010	Vitamin A	ALX-460-021
β-Carotene	ALX-460-004	Pyridoxal-5′-phosphate	ALX-460-011	Vitamin B12	ALX-460-024
Cochlioquinone A	ALX-350-335	Pyridoxol . HCl	ALX-460-014	Vitamin D2	ALX-460-025
Cochlioquinone B	ALX-350-341	Riboflavine	ALX-460-015	Vitamin D3	ALX-460-026
Flavin Adenine Dinucleotide . 2Na	ALX-480-084	Riboflavine-5′-phosphate . Na	ALX-460-016	Vitamin K1	ALX-460-027
Folic acid	ALX-460-006	Thiamine . HCl	ALX-460-017		

Antimicrobial Peptides & Proteins (For Details see Page 102)

CAP37 (human)	BC0-5016	CRAMP-18 (mouse)	PT-PA-AMP-003	LL-37 (human)	PT-PA-AMP-004
CRAMP (mouse)	PT-PA-AMP-002	HNP 1-3 (Mature Peptides) (human)	PT-PA-AMP-001		

Alphabetical Product Listing

CAS: 52665-69-7
MI: **14:** 1639



A23187 (free acid)

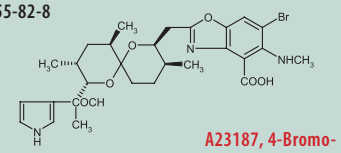
1233A see Hymeglusin

A23187 (free acid) [Calcium Ionophore A23187; Calcimycin]

ALX-450-001-M001	1 mg	ALX-450-001-M010	10 mg
ALX-450-001-5001	5 x 1 mg	ALX-450-001-M025	35 mg
ALX-450-001-M005	5 mg	ALX-450-001-M050	50 mg

Isolated from *Streptomyces chartreusis.* Antibiotic possessing weak *in vitro* antimicrobial activity against gram positive bacteria and fungi. Divalent cation ionophore used to increase intracellular Ca^{2+} levels in intact cells.

CAS: 76455-82-8



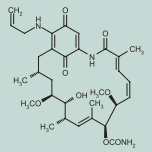
A23187, 4-Bromo-

A23187 (Mixed Calcium-Magnesium Salt)

ALX-450-002-M005	5 mg
ALX-450-002-M010	10 mg
ALX-450-002-M050	50 mg

Semisynthetic. Salt form of A23187 (Prod. No. ALX-450-001). Used in cell activation experiments when calcium dose-response data are not required.

CAS: 75747-14-7



17-AAG

Technical Note Page 98

A-9145 see Sinefungin

A23187, 4-Bromo- [4-Bromo-A23187; 4-Bromo-Calcimycin; 4-Bromo-Calcium Ionophore A23187]

ALX-450-003-M001	1 mg
ALX-450-003-M005	5 mg

Semisynthetic. Brominated analog of the widely used calcium ionophore A23187 (Prod. No. ALX-450-001). Nonfluorescent, and therefore used as a calibration standard for determining cytoplasmic calcium ions by fluorescent probes.

Aabomycin see Venturicidin

7-AAD see Actinomycin D, 7-Amino-

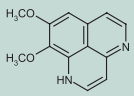
17-AAG [17-(Allylamino)-17-desmethoxygeldanamycin]

Bulk

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

Semisynthetic derivative from geldanamycin (Prod. ALX-380-054). Potent, less toxic derivative of geldanamycin. Inhibits the essential ATPase activity of HSP90. Inhibitor of telomerase activity. Inducer of apoptosis with antitumor activity.

CAS: 85547-22-4



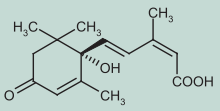
Aaptamine

Aaptamine

ALX-350-104-M001	1 mg

Isolated from the sponge *Aaptos aaptos.* Competitive antagonist of α-adrenoceptors in vacuolar smooth muscle cells. Inhibits cancer cell growth.

CAS: 21293-29-8
MI: **14:** 11



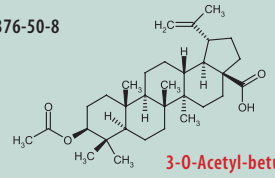
(+)-*cis,trans*-Abscisic acid

(+)-*cis,trans*-Abscisic acid

ALX-350-255-C500	500 µg
ALX-350-255-M001	1 mg
ALX-350-255-M005	5 mg

Isolated from *Curvularia lunata.* Natural and active isomer of the abscission accelerating plant hormone.

CAS: 10376-50-8



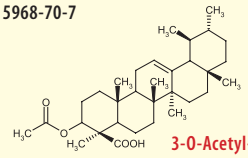
3-O-Acetyl-betulinic acid

3-O-Acetyl-betulinic acid

ALX-350-313-M005	5 mg
ALX-350-313-M025	25 mg

Shows cytotoxic activity on human cancer cell lines.

CAS: 5968-70-7



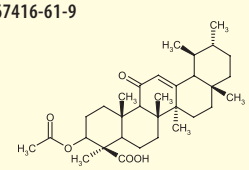
3-O-Acetyl-β-boswellic acid

3-O-Acetyl-β-boswellic acid [AKβA]

ALX-350-308-M001	1 mg
ALX-350-308-M005	5 mg

Isolated from *Boswellia sp.* Shows antitumor and anti-inflammatory activities. Potent non-redox, non-competitive 5-lipoxygenase and topoisomerase I and IIa inhibitor leading to apoptosis. 10-100 times more potent than natural boswellic acid.

CAS: 67416-61-9



3-O-Acetyl-11-keto-β-boswellic acid

3-O-Acetyl-11-keto-β-boswellic acid [AKβBA]

ALX-350-310-M005	5 mg

Isolated from *Boswellia serrata*. Shows antitumor and anti-inflammatory activities. Potent non-redox, noncompetitive 5-lipoxygenase and topoisomerase I and IIa inhibitor leading to apoptosis. 10-times more potent than 3-O-acetyl-β-boswellic acid (Prod. No. ALX-350-308). Exhibits *in vivo* efficacy in tumor growth and inhibition.

LIT: Acetyl-11-keto-beta-boswellic acid induces apoptosis in HL-60 and CCRF-CEM cells and inhibits topoisomerase I: R.F. Hoernlein, et al.; J. Pharmacol. Exp. Ther. **288,** 613 (1999) ▪ Boswellic acids activate p42(MAPK) and p38 MAPK and stimulate Ca(2+) mobilization: A. Altmann, et al.; BBRC **290,** 185 (2002) ▪ Coupling of boswellic acid-induced Ca2+ mobilisation and MAPK activation to lipid metabolism and peroxide formation in human leucocytes: A. Altmann, et al.; Br. J. Pharmacol. **141,** 223 (2004) ▪ Inhibition of IkappaB kinase activity by acetyl-boswellic acids promotes apoptosis in androgen-independent PC-3 prostate cancer cells in vitro and in vivo: T. Syrovets, et al.; J. Biol. Chem. **280,** 6170 (2005) ▪ Boswellic acids: biological actions and molecular targets: D. Poeckel & O. Werz; Curr. Med. Chem. **13,** 3359 (2006) ▪ Mechanisms underlying the anti-inflammatory actions of boswellic acid derivatives in experimental colitis: C. Anthoni, et al.; Am. J. Physiol. Gastrointest. Liver Physiol. **290,** G1131 (2006) ▪ Potentiation of antinociceptive effect of NSAIDs by a specific lipooxygenase inhibitor, acetyl 11-keto-beta boswellic acid: M. Bishnoi, et al.; Indian J. Exp. Biol. **44,** 128 (2006)

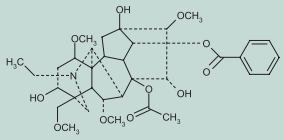
13-Acetyl, 12-Deoxyphorbol- see 12-Deoxyphorbol 13-acetate

Aconitine

ALX-550-232-M025 25 mg

Isolated from the plant *Aconitum karacolium.* A lipid-soluble neurotoxin that acts as a sodium channel modulator. Blocks tetrodotoxin-sensitive Na^+ channels.

CAS: 302-27-2
MI: **14:** 118



Aconitine

Actidione see Cycloheximide

Widest Panel of Actinomycins

Actinomycin IV see Actinomycin D

Actinomycin C

[Cactinomycin]

ALX-380-024-M005 5 mg
ALX-380-024-M025 25 mg

Isolated from *Streptomyces chrysomallus.* Antibiotic complex with antitumor activity.

Actinomycin C_1 see Actinomycin D

Actinomycin C_2

ALX-380-082-C500 500 µg

Isolated from *Streptomyces sp.* Antitumor antibiotic.

Actinomycin C_3

ALX-380-077-M001 1 mg

Isolated from *Streptomyces sp.* Antitumor antibiotic.

Actinomycin D

[Actinomycin IV; Actinomycin C_1; Dactinomycin]

Bulk

ALX-380-009-M005 5 mg
ALX-380-009-M025 25 mg
ALX-380-009-M100 100 mg

Antibiotic isolated from *Streptomyces parvulus.* Antineoplastic drug. DNA intercalating agent. Cytotoxic inducer of apoptosis against tumor cells. Inhibitor of RNA synthesis. For nomenclature of the actinomycins see S.A. Waksman, E. Katz & L.C. Vining; PNAS 44, 602 (1958)

Actinomycin D, 7-Amino-

[7-AAD]

Bulk

ALX-380-283-M001 1 mg
ALX-380-283-M005 5 mg

Semisynthetic from actinomycin D (Prod. No. ALX-380-009). Membrane impermeable fluorescent DNA intercalator. Used as a fluorescent DNA stain. Inhibitor of DNA-primed RNA polymerase and DNA polymerase. Induces apoptosis and is used as a tool to identify apoptotic cells. Cytochemical probe. Exhibits growth-inhibitory activity against certain leukemias and sarcomas. Has antibacterial properties.

Actinomycin $X_{0\beta}$

ALX-380-083-C200 200 µg

Isolated from *Streptomyces sp.* Antitumor antibiotic.

Actinomycin $X_{0\delta}$

ALX-380-084-C200 200 µg

Isolated from *Streptomyces sp.* Antitumor antibiotic.

Actinomycin X_2

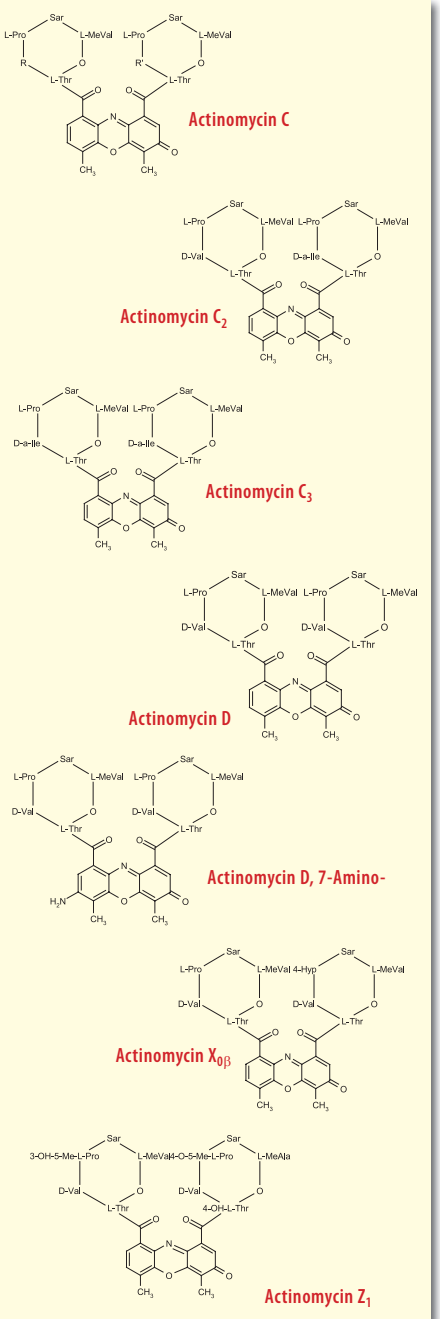
ALX-380-080-M001 1 mg

Isolated from *Streptomyces sp.* Antitumor antibiotic. Has higher cytotoxicity toward cultured human leukemia (HL-60) cells than actinomycin D (Prod. No. ALX-380-009). Induces cell death via apoptosis.

Actinomycin Z_1

ALX-380-085-C200 200 µg

Isolated from *Streptomyces sp.* Antitumor antibiotic.

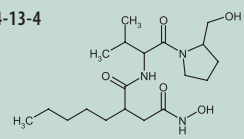


Actinonin

ALX-260-128-M005 5 mg

Synthetic. Inhibitor of aminopeptidase M, leucine aminopeptidase and deformylase. Shows antitumor activity. Apoptosis inducer.

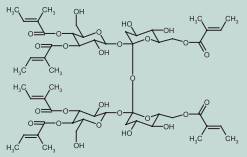
CAS:13434-13-4



Actinonin

Adenosylornithine see Sinefugin

CAS: 216590-44-2



Actinotetraose Hexatiglate

Actinotetraose Hexatiglate

ALX-350-344-M001 1 mg

Isolated from *Amycolatopsis sp.* MST-AS5902. Unique tetrasaccharide with six tiglate esters. Shows no significant antimicrobial activity.

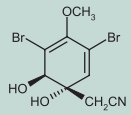
Adenylate Cyclase Toxin [AC Toxin]

ALX-630-088-C050 50 µg

Recombinant *Bordetella pertussis* adenylate cyclase toxin produced in *E. coli*. Important virulence factor and a research tool for manipulation of cAMP levels in mammalian cells. Has the ability to interact with target cells, insert into the cytoplasmic membrane and deliver its adenylate cyclase enzymatic domain to the cell interior.

Adriamycin see Doxorubin

CAS: 28656-91-9



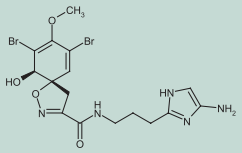
(+)-Aeroplysinin-1

(+)-Aeroplysinin-1

ALX-350-256-M001 1 mg

Isolated from *Aplysina aerophoba*. Displays cytostatic and cytotoxic activity. Inhibitor of EGFR kinase. Shows antiangiogenic activity.

CAS: 87075-23-8



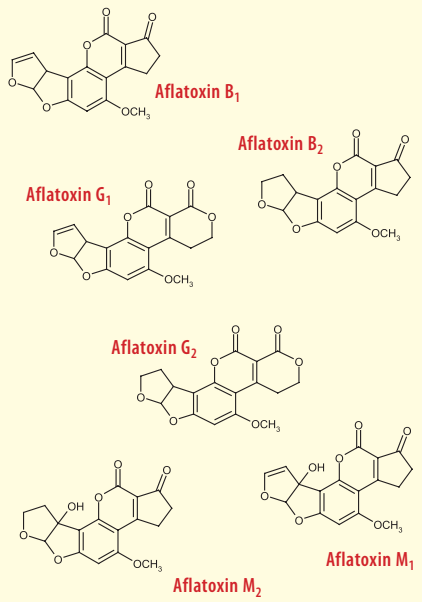
Aerophobin-2

Aerophobin-2

ALX-350-156-M001 1 mg

Isolated from *Aplysina aerophoba*. Cytotoxic alkaloid. Shows antibiotic properties.

Wide Panel of Aflatoxins



Technical Note Page 111

Aflatoxin B_1

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

Isolated from *Aspergillus flavus*. Naturally occuring mycotoxin that is produced by many species of Aspergillus. Aflatoxins are metabolized by the liver to the reactive intermediate aflatoxin M_1. High-level aflatoxin exposure produces an acute necrosis, cirrhosis, and carcinoma of the liver. Induces DNA damage.

Aflatoxin B_2

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

Isolated from *Aspergillus flavus*. Potent hepatotoxic and hepatocarcinogenic mycotoxin.

Aflatoxin G_1

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

Isolated from *Aspergillus flavus*. Potent hepatotoxic and hepatocarcinogenic mycotoxin.

Aflatoxin G_2

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

Isolated from *Aspergillus flavus*. Potent hepatotoxic and hepatocarcinogenic mycotoxin.

Aflatoxin M_1

ALX-630-095-MC01 0.1 mg

Isolated from *Aspergillus flavus*. Mycotoxin. Hydroxylated metabolite of aflatoxin B_1.

Aflatoxin M_2 [4-Hydroxyaflatoxin B_2]

ALX-630-114-MC01 0.1 mg

Isolated from *Aspergillus flavus*. Potent hepatotoxic and hepatocarcinogenic mycotoxin. Metabolite of aflatoxin B_2. DNA-damaging agent.

H-Lys-Lys-Lys-Cys-Ile-Ala-Lys-Asp-Tyr-Gly-Arg-Cys-Lys-Trp-Gly-Gly-Thr-Pro-Cys-Cys-Arg-Gly-Arg-Gly-Cys-Ile-Cys-Ser-Ile-Met-Gly-Thr-Asn-Cys-Glu-Cys-Lys-Pro-Arg-Leu-Ile-Met-Glu-Gly-Leu-Gly-Leu-Ala-OH (Disulfide bonds between Cys^4-Cys^{20}, Cys^{12}-Cys^{25}, Cys^{19}-Cys^{36} and Cys^{27}-Cys^{34})

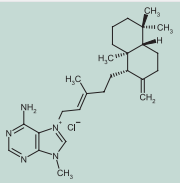
ω-Agatoxin

ω-Agatoxin IVA

ALX-630-001-C100 100 µg

Synthetic. Originally isolated from *Agelenopsis aperta*. Selective P-type Ca^{2+} channel blocker.

CAS: 92664-80-7



Agelasine D

Agelasine D

ALX-350-315-M001 1 mg

Isolated from the sponge *Agelas nakamurai*. Displays broad spectrum of antibacterial activities. Antineoplastic compound. Associated with contractive responses of smooth muscles and inhibition of Na^+/K^+-ATPase.

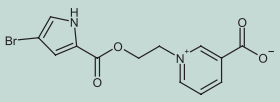
LIT: (+)-agelasine D: improved synthesis and evaluation of antibacterial and cytotoxic activities: A. Vik, et al.; J. Nat. Prod. **69,** 381 (2006) ▪ Antimicrobial and cytotoxic activity of agelasine and agelasimine analogs: A. Vik, et al.; Bioorg. Med. Chem. **15,** 4016 (2007)

Agelongine

ALX-350-326-M001 1 mg

Isolated from the sponge *Agelas longissima.* Alkaloid exhibiting antagonistic activity on serotonin receptors.

CAS: 163564-84-9



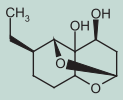
Agelongine

Agistatine B

ALX-350-151-M001 1 mg
ALX-350-151-M005 5 mg

Isolated from fungus FH-A 6239. A tricyclic analog of agistatine A, which has been described as an inhibitor of cholesterol biosynthesis.

CAS: 144096-46-8



Agistatine B

Alamethicin [U-22324]

ALX-380-046-M001 1 mg
ALX-380-046-M005 5 mg

Isolated from *Trichoderma viride.* Membrane permeabilizing antibiotic.

CAS: 27061-78-5

Ac-Aib-Pro-Aib-Ala-Aib-Ala-Gln-Aib-Val-Aib-Gly-Leu-Aib-Pro-Val-Aib-Aib-Glu-Gln-Phl

Alamethicin

β-Alanyl-L-histidine see Carnosine

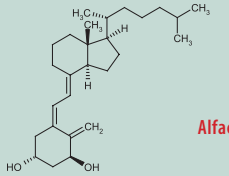
Albamycin see Novobiocin

Alfacalcidol [Hydroxyvitamin D3; 1-Hydroxycholecalciferol]

ALX-460-036-M001 1 mg

Converts to active calcitriol (1α,25-dihydroxyvitamin D3; Prod. No. ALX-460-032) *in vivo*. Inhibits bone resorption.

CAS: 41294-56-8



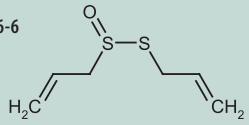
Alfacalcidol

Allicin [Diallyl thiosulfinate]

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

Synthetic. Active metabolite of garlic. Exhibits antimicrobial, antioxidant, antiproliferative, chemopreventive, antihyperlipidaemic and antihypertensive effects. Inhibits telomerase activity. Induces apoptosis. Inhibits inducible nitric oxide synthase (iNOS; NOS II) expression.

CAS: 539-86-6
MI: **14:** 261



Allicin

Technical Note Page 103

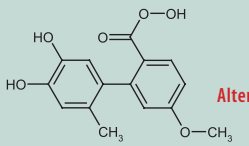
17-(Allylamino)-17-desmethoxygeldanamycin see 17-AAG

Altenusin

ALX-350-325-M001 1 mg
ALX-350-325-M005 5 mg

Isolated from *Alternaria sp.* Antifungal penicillide. Non-competitive, specific neutral sphingomyelinase (N-SMase) and strong pp60c-Src inhibitor. Inhibits cFMS receptor tyrosine kinase (CSF-1/m-CSF receptor tyrosine kinase) which is implicated in cancer and bone diseases. Myosin light chain kinase inhibitor. Exhibits anti-HIV-1 integrase activity.

CAS: 31186-12-6



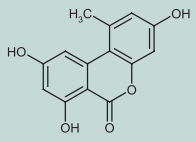
Altenusin

Alternariol [AOH]

ALX-350-139-M001 1 mg

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

CAS: 641-38-3



Alternariol

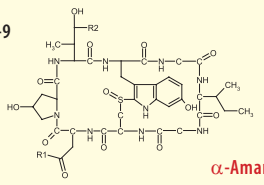
Technical Note Page 109

α-Amanitin

ALX-350-270-M001 1 mg

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.

CAS: 23109-05-9
MI: **14:** 373



α-Amanitin

β-Amanitin

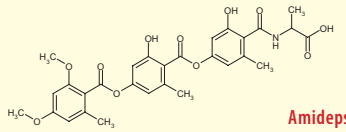
ALX-350-271-M001 1 mg

Isolated from *Amanita phalloides* mushrooms. Biological activity like α-amanitin (Prod. No. ALX-350-270), but contains a carboxy group which is useful for coupling reactions.

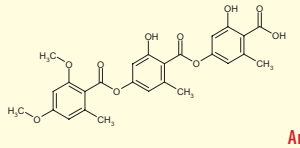
γ-Amanitin

ALX-350-272-M001 1 mg

Isolated from *Amanita phalloides* mushrooms. Biological activity like α-amanitin (Prod. No. ALX-350-270).



Amidepsine A



Amidepsine D

Amidepsine A

ALX-380-262-M001 1 mg
ALX-380-262-MM25 2.5 mg

Isolated from fungal strain FO-2943. Inhibitor of diacylglycerol acyltransferase (DGAT). Excessive accumulation of triacetylglycerol produced by DGAT may cause fatty liver, obesity and hypertriglyceridemia, which may lead to atherosclerosis, diabetes and metabolic disorders.

Fungal strain courtesy of The Kitasato Institute, Tokyo.

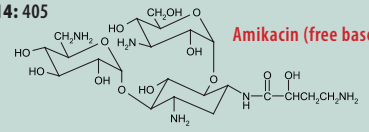
Amidepsine D

ALX-380-263-M001 1 mg
ALX-380-263-MM25 2.5 mg

Isolated from fungal strain FO-2943. Inhibitor of diacylglycerol acyltransferase (DGAT). Excessive accumulation of triacetylglycerol produced by DGAT may cause fatty liver, obesity and hypertriglyceridemia, which may lead to atherosclerosis, diabetes and metabolic disorders.

Fungal strain courtesy of The Kitasato Institute, Tokyo.

CAS: 37517-28-5
MI: **14:** 405



Amikacin (free base)

Amikacin (free base)

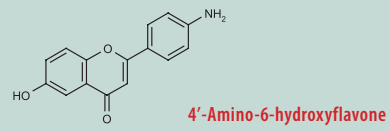
ALX-380-045-G001 1 g

Semisynthetic from kanamycin A (Prod. No. ALX-380-275). Aminoglycoside antibiotic. Effective against Gram-negative and Gram-positive bacteria.

Amikacin . disulfate

ALX-380-266-M250 250 mg
ALX-380-266-G001 1 g

Semisynthetic from kanamycin A (Prod. No. ALX-380-275). Aminoglycoside antibiotic. Effective against Gram-negative and Gram-positive bacteria.



4′-Amino-6-hydroxyflavone

7-Amino-actinomycin D see **Actinomycin D, 7-Amino-**

Aminogenistein see **4′-Amino-6-hydroxyflavone**

4′-Amino-6-hydroxyflavone [Aminogenistein]

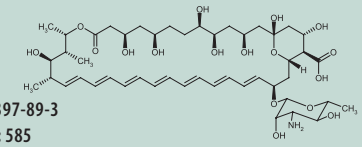
ALX-385-021-M001 1 mg

Inhibitor of the p56lck protein-tyrosine kinase.

Amino-phalloidin see **Phalloidin, Amino-**

3-Amino-9-thio(10H)-acridone see **3-ATA**

CAS: 1397-89-3
MI: **14:** 585



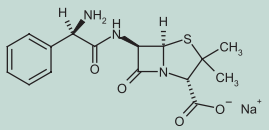
Amphotericin B

Amphotericin B [Fungizone]

ALX-380-280-M250 250 mg

Antibiotic. Isolated from *Streptomyces sp.* Interferes with fungal membrane permeability by forming channels in the membranes and causing small molecules to leak out. Effective against yeasts and molds.

CAS: 69-52-3
MI: **14:** 586



Ampicillin . Na

Ampicillin . Na [D-(–)-α-Aminobenzylpenicillin]

ALX-380-268-G005 5 g

Semisynthetic from penicillin. β-Lactam antibiotic. Inhibits bacterial cell-wall synthesis (peptidoglycan cross-linking). Inactivates transpeptidases on the inner surface of the bacterial cell membrane. Effective against Gram-negative and Gram-positive bacteria. Is inactivated by β-lactamase.

Ac-Trp-Ala-Aib-Aib-Leu-Aib-Gln-Aib-Aib-Aib-Gln-Leu-Aib-Gln-Leucinol

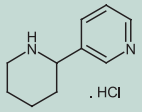
Ampullosporin A

Ampullosporin A

ALX-350-106-M001 1 mg
ALX-350-106-M005 5 mg

Antibiotic isolated from *Sepedonium ampullosporum*. Peptaibol-type polypeptide. Induces pigment formation by the fungus *Phoma destructiva,* causes hypothermia in mice, displays neuroleptic activity in rats and forms instable pores in artificial bilayer membranes.

CAS: 15251-47-5
MI: **14:** 619



Anabasine . HCl

Anabasine . HCl [3-(2-Piperidinyl)pyridine; 2-(3-Pyridyl)piperidine; Neonicotine]

ALX-350-112-M025 25 mg
ALX-350-112-M100 100 mg

Isolated from *Anabasis aphylla*. Tobacco alkaloid. Potent nicotinic acetylcholine receptor agonist. Insecticide.

LIT: Nicotine, cotinine, and anabasine inhibit aromatase in human trophoblast in vitro: R.L. Barbieri, et al.; J. Clin. Invest. **77,** 1727 (1986) ▪ Anabasine and anatabine as biomarkers for tobacco use during nicotine replacement therapy: P. Jacob, 3rd, et al.; Cancer Epidemiol. Biomarkers Prev. **11,** 1668 (2002) ▪ Anabasine, a selective nicotinic acetylcholine receptor agonist, antagonizes MK-801-elicited mouse popping behavior, an animal model of schizophrenia: J. Mastropaolo, et al.; Behav. Brain Res. **153,** 419 (2004) ▪ Anabasine toxicity from a topical folk remedy: N.G. Murphy, et al.; Clin. Pediatr. (Phila) **45,** 669 (2006)

Anandimycin see **Gilvocarcin**

Angoroside C

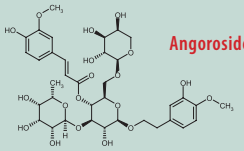
[Isoangoroside C]

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 E2 release in mouse peritoneal macrophages *in vitro.* Shows potent antioxidative activity in reducing the oxidized OH adducts of dAMP and dGMP. Reveals some trypanocidal potential.

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) ▪ Anti-protozoal and plasmodial FabI enzyme inhibiting metabolites of Scrophularia lepidota roots: D. Tasdemir, et al.; Phytochemistry **66,** 355 (2005)

CAS: 115909-22-3



Angoroside C

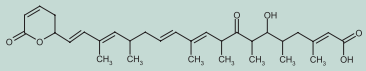
Anguinomycin A

[5-Demethylleptomycin A; KR 2827A]

ALX-380-202-MC01 0.1 mg

Isolated from *Streptomyces sp.* MST-AS5546. Antitumor antibiotic. Displays nanomolar cytotoxicity to murine P388 leukemia cells. Analog of leptomycin B (Prod. No. ALX-380-100), an inhibitor of nuclear protein export.

CAS: 111278-01-4



Anguinomycin A

Technical Note Page 93

Angustmycin A see Decoyinine

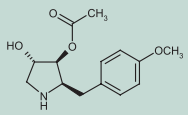
Anisomycin

Bulk

ALX-380-051-M010 10 mg
ALX-380-051-M050 50 mg
ALX-380-051-M100 100 mg

Antibiotic. Isolated from *Streptomyces griseolus.* Activator of p38 and MAP kinases. Synergistic with growth factors and phorbol esters to superinduce cFos and cJun, by acting as a potent signalling agonist. Induces apoptosis in the human monoblastoid cell line. Used in the eradication of bean mildew. Inhibits other pathogenic fungi in plants.

CAS: 22862-76-6
MI: **14:** 670



Anisomycin

Ansatrienin A

[Mycotrienin I; T 23I]

ALX-380-203-M001 1 mg

Isolated from *Streptomyces sp.* MST-AS5998. Antitumor antibiotic, closely related to the cytotrienins. Significantly potentiates the action of several clinical antitumor agents. Inhibits osteoclastic bone resorption.

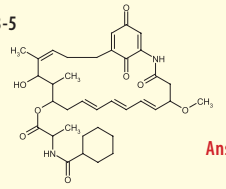
Ansatrienin B

[Mycotrienin II; T 23II]

ALX-380-204-M001 1 mg

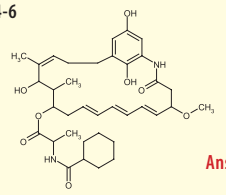
Isolated from *Streptomyces sp.* MST-AS5998. Antitumor antibiotic, closely related to the cytotrienins. Displays potent anti-cancer activities. Significantly potentiates the action of several clinical antitumor agents. Inhibits osteoclastic bone resorption.

CAS: 82189-03-5



Ansatrienin A

CAS: 82189-04-6



Ansatrienin B

Antimycin see Citrinin

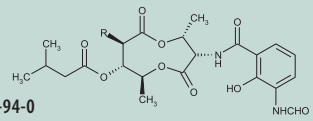
Antimycin A

[Antipiricullin; Virosin]

ALX-380-075-M005 5 mg
ALX-380-075-M010 10 mg

Antibiotic. Isolated from *Streptomyces sp.* Mixture of antimycin A's. Induces apoptosis, which is not prevented by the presence of Bcl-2. Inhibits mitochondrial electron transport specifically between cytochromes b and c1.

CAS: 1397-94-0
MI: **14:** 714 (A1) & 715 (A3)



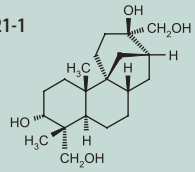
Antimycin A

(+)-Aphidicolin

ALX-350-016-M001 1 mg
ALX-350-016-M005 5 mg
ALX-350-016-M025 25 mg

Isolated from *Nigrospora oryzae.* Reversible inhibitor of eukaryotic nuclear DNA replication. Useful for cell synchronization. Blocks the cell cycle at early S phase. Prolongs the half life of DNA methyltransferase. Specific inhibitor of DNA polymerase α and δ in eukaryotic cells and in some viruses of animal origin. Acts synergistically with vincristine and doxorubicin. Apoptosis inhibitor/inducer.

CAS: 38966-21-1
MI: **14:** 727



(+)-Aphidicolin

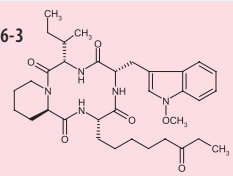
Apicidin

ALX-350-095-M001 1 mg
ALX-350-095-M005 5 mg

Isolated from *Fusarium sp.* Potent inhibitor of histone deacetylase (HDAC). Inhibits proliferation. Induces cell cycle arrest. Stimulates apoptosis of cancer cells. Antiprotozoal.

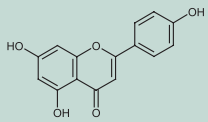
LIT: Apicidin: a novel antiprotozoal agent that inhibits parasite histone deacetylase: S.J. Darkin-Rattray, et al.; PNAS **93,** 13143 (1996) ▪ Apicidin, a histone deacetylase inhibitor, inhibits proliferation of tumor cells via induction of p21WAF1/Cip1 and gelsolin: J.W. Han, et al.; Cancer Res. **60,** 6068 (2000) ▪ Transcriptional activation of p21(WAF1/CIP1) by apicidin, a novel histone deacetylase inhibitor: J.S. Kim, et al.; BBRC **281,** 866 (2001) ▪ Broad spectrum antiprotozoal agents that inhibit histone deacetylase: structure-activity relationships of apicidin. Part 1: S.L. Colletti, et al.; Bioorg. Med. Chem. Lett. **11,** 107 (2001) ▪ Broad spectrum antiprotozoal agents that inhibit histone deacetylase: structure-activity relationships of apicidin. Part 2: S.L. Colletti, et al.; Bioorg. Med. Chem. Lett. **11,** 113 (2001) ▪ Structure and chemistry of apicidins, a class of novel cyclic tetrapeptides without a terminal alpha-keto epoxide as inhibitors of histone deacetylase with potent antiprotozoal activities: S.B. Singh, et al.; J. Org. Chem. **67,** 815 (2002) ▪ Apicidin, a histone deacetylase inhibitor, induces differentiation of HL-60 cells: J. Hong, et al.; Cancer Lett. **189,** 197 (2003) ▪ Activation of NF-kappaB by HDAC inhibitor apicidin through Sp1-dependent de novo protein synthesis: its implication for resistance to apoptosis: Y.K. Kim, et al.; Cell Death Differ. **13,** 2033 (2006) ▪ Apicidin, a novel histone deacetylase inhibitor, has profound anti-growth activity in human endometrial and ovarian cancer cells: T. Ueda, et al.; Int. J. Mol. Med. **19,** 301 (2007)

CAS: 183506-66-3



Apicidin

CAS: 520-36-5
MI: **14:** 730

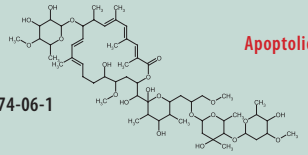


Apigenin

Apigenin [4′,5,7-Trihydroxyflavone]

ALX-385-008-M010 10 mg
ALX-385-008-M050 50 mg

Synthetic. Antioxidant flavonoid. Has chemopreventive and antitumor properties. Induces apoptosis. Inhibits the proliferation of malignant tumor cells by G2/M arrest. MAP kinase (MAPK/ERK) inhibitor. Inhibits hypoxia-inducible factor-1 (HIF-1) and vascular endothelial growth factor (VEGF) expression.



Apoptolidin

CAS: 194874-06-1

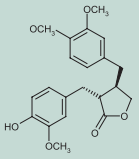
Apoptolidin

ALX-380-207-MC01 0.1 mg

Antibiotic. Isolated from *Amicolatopsis sp.* MST-AS5912. Originally isolated from *Nocardiopsis sp.* Potent and highly selective apoptosis inducer in several cancer cell lines. F_0F_1-ATPase inhibitor.

Apoptolidin, Iso- see Isoapoptolidin

CAS: 7770-78-7



(-)-Arctigenin

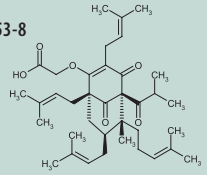
(-)-Arctigenin

ALX-350-312-M025 25 mg

Antibiotic. Isolated from *Arctium lappa.* Lignan derivative, which shows antitumor, anti-inflammatory, immunomodulatory and neuroprotective activities. Down-regulates anti-apoptotic protein Bcl_{XL}. Potent inhibitor of HIV type-I integrase and DNA topoisomerase II. Shows phytoestrogenic and cytotoxic properties against Hep62 cells. Antagonist for platelet activating factor and Ca^{2+}. Blocks the activation of Akt (protein Kinase B; PKB) induced by glucose starvation.

LIT: Antiproliferative effect of Arctigenin and Arctiin: S.Y. Ryu, et al.; Arch. Pharm. Res. **18,** 462 (1995) ▪ (-)-Arctigenin as a lead structure for inhibitors of human immunodeficiency virus type-1 integrase: E. Eich, et al.; J. Med. Chem. **39,** 86 (1996) ▪ Immunomodulatory effect of arctigenin, a lignan compound, on tumour necrosis factor-alpha and nitric oxide production, and lymphocyte proliferation: J.Y. Cho, et al.; J. Pharm. Pharmacol. **51,** 1267 (1999) ▪ Arctigenin protects cultured cortical neurons from glutamate-induced neurodegeneration by binding to kainate receptor: Y.P. Jang, et al.; J. Neurosci. Res. **68,** 233 (2002) ▪ A phytochemical study of lignans in whole plants and cell suspension cultures of Anthriscus sylvestris: A. Koulman, et al.; Planta Med. **69,** 733 (2003) ▪ Naturally occurring lignans efficiently induce apoptosis in colorectal tumor cells: B. Hausott, et al.; J. Cancer Res. Clin. Oncol. **129,** 569 (2003) ▪ Arctigenin, a phenylpropanoid dibenzylbutyrolactone lignan, inhibits MAP kinases and AP-1 activation via potent MKK inhibition: the role in TNF-alpha inhibition: M.K. Cho, et al.; Int. Immunopharmacol. **4,** 1419 (2004) ▪ Identification of arctigenin as an antitumor agent having the ability to eliminate the tolerance of cancer cells to nutrient starvation: S. Awale, et al.; Cancer Res. **66,** 1751 (2006) ▪ The chemopreventive effects of Saussurea salicifolia through induction of apoptosis and phase II detoxification enzyme: K. Kang, et al.; Biol. Pharm. Bull. **30,** 2352 (2007)

CAS: 849215-53-8



Aristoforin

(-)-Arctiin

ALX-350-318-M025 25 mg

Isolated from *Arctium lappa.* Lignan derivative with antitumor activities. Down-regulates anti-apoptotic protein Bcl_{XL}. Potent inhibitor of HIV type-I integrase and DNA topoisomerase II. Shows phytoestrogenic activity and is an antagonist for platelet activating factor and Ca^{2+}.

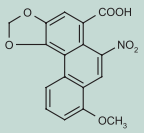
Aristoforin

ALX-350-129-M001 1 mg

Stable and water-soluble derivative of hyperforin (Prod. No. ALX-350-097) inducing apoptosis. Antitumor agent. Inhibits sirtuins.

LIT: Aristoforin, a novel stable derivative of hyperforin, is a potent anticancer agent: M. Gartner, et al.; Chembiochem. **6,** 171 (2005) ▪ Phloroglucinol Derivatives Guttiferone G, Aristoforin, and Hyperforin: Inhibitors of Human Sirtuins SIRT1 and SIRT2: C. Gey, et al.; Angew. Chem. Int. Ed. Engl. **46,** 5219 (2007)

CAS: 313-67-7
MI: **14:** 786



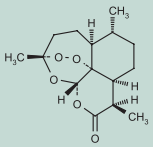
Aristolochic acid

Aristolochic acid

ALX-270-047-M025 25 mg
ALX-270-047-M100 100 mg

Isolated from *Aristolochia clematis.* Phospholipase A2 (PLA2) inhibitor active against the enzymes found in many snake venoms as well as those of human platelets and synovial fluids. Inhibits ionophore-stimulated PLA2 activity in human neutrophils. Has been shown to be nephropathic and carcinogenic.

CAS: 63968-64-9
MI: **14:** 817



Artemisinin

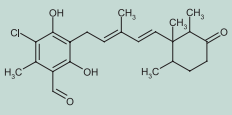
Artemisinin [Qinghaosu]

Bulk

ALX-350-219-M100 100 mg
ALX-350-219-G001 1 g

Isolated from the traditional Chinese anti-malarial herb *Artemisia annua L.* Powerful antimalarial agent. Inhibits angiogenesis by down-regulating HIF-1α and VEGF expression in mouse embryonic stem cells. Crosses the blood-brain barrier. Inhibitor of human inducible nitric oxide synthase (iNOS; NOS II).

CAS: 26166-39-2



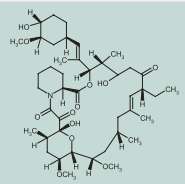
Ascochlorin

Ascochlorin [LL-Z 1272 γ]

ALX-350-334-MC05 0.5 mg

Isolated from *Acremonium sp.* MST-FP1890. Antitumor antibiotic. Shows antiviral activity. Inhibitor or matrix metalloproteinase 9 (MMP-9). Reduces the inflammatory response to TNF-α in rat vacuolar smooth muscle cells. May be useful as an antiatherogenic agent.

CAS: 11011-38-4



Ascomycin

Ascomycin [Immunomycin]

Bulk

ALX-380-005-M001 1 mg
ALX-380-005-M005 5 mg

Antibiotic. Isolated from *Streptomyces sp.* Ethyl analog of FK506 (ALX-380-005). Immunosuppressor. Binds to immunophilins. The ascomycin-immunophilin complex inhibits phosphatase 2B (calcineurin; PP2B). As a result of calcineurin inhibition, ascomycin inhibits T cell proliferation, production of pro-inflammatory cytokines and activation of mast cells.

L-(+)-Ascorbic acid [Vitamin C]

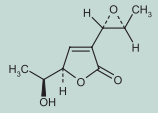
ALX-460-001-G010 10 g

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.

CAS: 76375-62-7



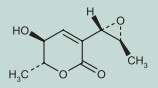
Asperlactone

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.

CAS: 17398-00-4



Aspyrone

Astaxanthin (crystalline) [3,3′-Dihydroxy-β,β-carotene-4,4′-dione]

ALX-460-031-M250 250 mg

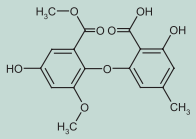
Synthetic. Extremely potent antioxidant. Shows anti-inflammatory properties. Has effects on cancer, cardiovacuolar disease, and diabetes.

Asterric acid [Dimethylosoic acid; TAN 1415A; WF 12880A]

ALX-380-208-M001 1 mg

Antibiotic. Isolated from *Aspergillus terreus* MST-FP1370. Inhibitor of vascular endothelial growth factor (VEGF).

CAS: 577-64-0



Asterric acid

3-ATA [3-Amino-9-thio(10*H*)-acridone]

ALX-350-273-M001 1 mg
ALX-350-273-M005 5 mg

Specific CDK4 inhibitor inducing growth inhibition of p16-altered tumors. Inhibits DNA synthesis and induces DNA damage in T cell acute lymphoblastic leukemia (T-ALL) in a p16-dependent manner.

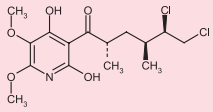
Atpenin A5

ALX-380-108-C250 250 µg

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

Fungal strain courtesy of The Kitasato Institute, Tokyo.

CAS: 119509-24-9

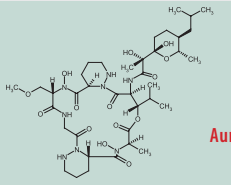


Atpenin A5

Aurantimycin A

ALX-380-086-M001 1 mg
ALX-380-086-M005 5 mg

Isolated from *Streptomyces aurantiacus* IMET 43917. Has strong antibiotic activity against Gram-positive bacteria and cytotoxicity. Shows inhibitory effects on cellular adhesion and anaphylatoxin receptor binding.



Aurantimycin A

Auraptene [7-Geranyloxycoumarin]

ALX-350-361-M005 5 mg
ALX-350-361-M025 25 mg

Isolated from citrus fruit. Anti-inflammatory and chemopreventive compound. Exerts tumor preventive effects through apoptosis. Suppresses cell proliferation and lipid peroxidation. Acts as an agonist of PPARs. Induces phase II drug-metabolizing enzymes. ***Technical Note Page 105.***

Aureolic acid see Mithramycin A

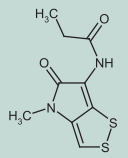
Aureomycin see Chlortetracycline

Aureothricin [Propionylpyrrothione; Farcinicin]

ALX-380-240-MC05 0.5 mg

Antibiotic. Isolated from *Streptomyces sp.* MST-AS4782. More hydrophobic analog of the antibiotic thiolutin (Prod. No. ALX-380-200) with selective antitumor activity. Potent inhibitor of bacterial and yeast RNA polymerases and of fungal mannan and glucan formation.

CAS: 574-95-8

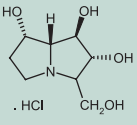


Aureothricin

Australine . HCl

ALX-270-157-M001 1 mg

Alkaloid. Isolated from *Castanospermum australe* seeds. Inhibitor of α-glucosidase, amyloglucosidase and glucosidase I. Does not inhibit glucosidase II, and is reported to be the first glucosidase inhibitor which differentiates glucosidase I from glucosidase II. Does not inhibit α-galactosidase, β-galactosidase, β-glucosidase, α-mannosidase and β-mannosidase.



Australine . HCl

Avarol [NSC306951]

ALX-350-319-M001 1 mg

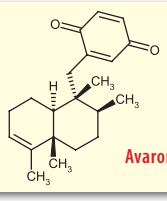
Isolated from marine sponge *Dysidea avara.* Cytostatic agent which has potent antileukemic activity both *in vitro* and *in vivo* (mice). Also displays antibacterial and antifungal activities against a limited range of microorganisms. Inhibits HIV-1 reverse transcriptase.

Avarone

ALX-350-321-M001 1 mg

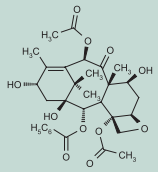
For technical information see Product Avarol (Prod. No. ALX-350-319).

Avarol



Avarone

CAS: 27548-93-2



Baccatin III

Baccatin III

ALX-351-005-M005 5 mg
ALX-351-005-M025 25 mg

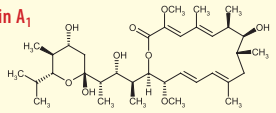
Semisynthetic. Starting material for the synthesis of taxol analogs. Shows antitumor properties.

Baccatin III, 10-Deacetyl- [10-Deacetyl-baccatin III]

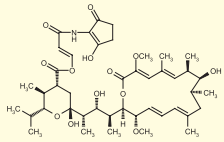
ALX-351-006-M005 5 mg
ALX-351-006-M025 25 mg

Isolated from *Taxus baccata*. Intermediate for the preparation of taxol analogs.

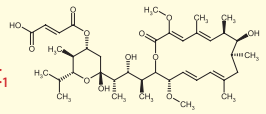
Bafilomycin A_1



Bafilomycin B_1



Bafilomycin C_1



The Bafilomycin Source™

Bafilomycin A_1

Bulk

ALX-380-030-C100 100 µg

Isolated from *Streptomyces griseus*. Macrolide antibiotic that acts as a specific inhibitor of vacuolar-type H^+-ATPase. Valuable tool for distinguishing among different types of ATPases. Inhibitor of endosomal acidification.

Bafilomycin B_1

Bulk

ALX-380-063-M001 1 mg

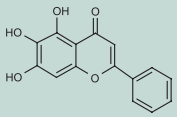
Isolated from *Streptomyces griseus*. Macrolide antibiotic that acts as a specific inhibitor of vacuolar-type H^+-ATPase.

Bafilomycin C_1 [L-681,110A1]

ALX-380-209-M001 1 mg

Isolated from *Streptomyces sp.* MST-AS5338. Macrolide antibiotic that acts as a specific inhibitor of vacuolar-type H^+-ATPase. Potential antiosteoporotic agent in treating bone lytic diseases.

CAS: 491-67-8
MI: **14:** 942



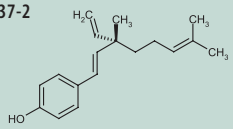
Baicalein

Baicalein [5,6,7-Trihydroxyflavone]

ALX-385-022-M005 5 mg
ALX-385-022-M025 25 mg

Inhibitor of the 12-lipoxygenase, leukotriene biosynthesis and the release of lysosomal enzymes. Inhibits cellular Ca^{2+} uptake and calcium mobilization. Inhibitor of protein tyrosine kinase in leukemia (CEM) cells. Induces cell cycle arrest and apoptosis. Anti-inflammatory compound. Has anti-thrombotic, anti-proliferative and anti-mitogenic effects.

CAS: 10309-37-2

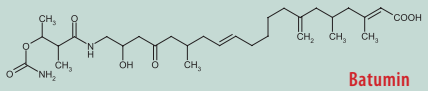


Bakuchiol

Bakuchiol

ALX-350-144-M001 1 mg

Isolated from plant *Psoralea corylifolia*. Inhibitor of protein tyrosine phosphatase 1B (PTP1B). Antioxidant. Inhibitor of mitochondrial lipid peroxidation. Inhibitor of inducible nitric oxide synthase (iNOS/NOS II) expression. DNA polymerase inhibitor. Shows antimicrobial and cytotoxic activity.



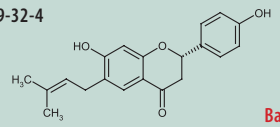
Batumin

Batumin

ALX-380-081-M010 10 mg

Isolated from *Pseudomonas batumici*. Antibiotic with high and selective activity against *Staphylococcus* strains including methicillin-resistant *S. Aureus* (MRSA) strains in a concentration of 1-10ng/ml. Poorly active or no effects against Micrococci and other Gram-positive microorganisms and fungi. Different degree of activity against Gram-negative bacteria. Useful for identification of *Staphylococcus* species in pure and mixed cultures.

CAS: 19879-32-4



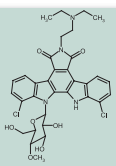
Bavachin

Bavachin

ALX-350-147-MC05 0.5 mg

Isolated from plant *Psoralea corylifolia*. Weak antioxidant. Antimutagenic. Stimulates bone formation and has potential activity against osteoporosis. Shows inhibitory activities against the antigen-induced degranulation and weak estrogen-like activity.

CAS: 119673-08-4



Becatecarin

Technical Note Page 102

Becatecarin [6-N-[2-(Diethylamino)ethyl]rebeccamycin; NSC 655649; BMY-27557-14; BMS-181176; XL 119]

Bulk

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

Semisynthetic water-soluble derivative of rebeccamycin (ALX-380-079). Antitumor antibiotic. Topoisomerase II inhibitor. DNA intercalating agent.

4′-N-Benzoyl-staurosporine see PKC412

Berbamine methyl ether see Isotetrandrine

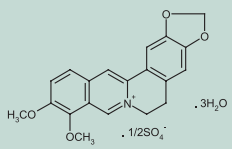
Berberine . hemisulfate

[Natural Yellow 18]

ALX-350-094-G001 1 g

Alkaloid which exhibits relatively weak antibiotic properties, because of its efflux by multidrug resistance pumps. The antimicrobial action of berberine is potentiated by 5′-methoxyhydnocarpin, a multidrug pump inhibitor. Lowers cholesterol levels through a mechanism different from that of statins. Upregulates the expression of liver low-density lipoprotein receptor (LDLR) resulting in improved clearance of plasma LDL cholesterol through receptor mediated endocytosis. Possesses anti-inflammatory, anti-diabetic and anti-angiogenic effects. Induces apoptosis.

CAS: 633-66-9
MI: **14:** 1154



Berberine . hemisulfate

Betulinic acid (high purity)

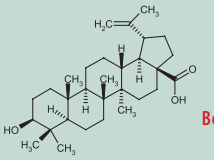
[3β-Hydroxy-20(29)-lupaene-28-oic acid]

Bulk

ALX-350-277-M005 5 mg
ALX-350-277-M025 25 mg
ALX-350-277-M100 100 mg

Isolated from *Platanus acerifolia* (plane) tree bark. Antitumor and anti-HIV agent. Induces apoptosis by activating mitochondrial permeability transition (MPT). Betulinic acid is an inhibitor of NF-κB activation and NF-κB-regulated gene expression induced by carcinogens and inflammatory stimuli.

CAS: 472-15-1



Betulinic acid

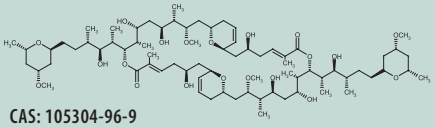
Betulinic acid (~95%)

[3β-Hydroxy-20(29)-lupaene-28-oic acid]

Bulk

ALX-350-298-M100 100 mg
ALX-350-298-M500 500 mg
ALX-350-298-G001 1 g

For technical information see Betulinic acid (high purity) (Prod. No. ALX-350-277).



CAS: 105304-96-9

Bistheonellide A

D-(+)-Biotin

[Vitamin H]

ALX-460-002-G001 1 g
ALX-460-002-G005 5 g

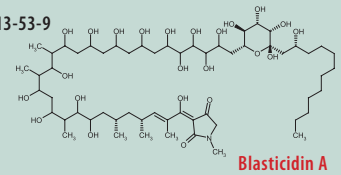
Bistheonellide A

[Misakinolide A]

ALX-350-287-C100 100 µg

Isolated from the marine sponge *Theonella sp.* Inhibits actin polymerization by forming a 1:2 complex with G-actin.

CAS: 100513-53-9



Blasticidin A

Blasticidin A

ALX-380-241-M001 1 mg

Antibiotic. Isolated from *Streptomyces sp.* MST-AS4079. Shows broad spectrum antifungal and antibacterial activity. Specific inhibitor of aflatoxin production by *Aspergillus parasiticus.*

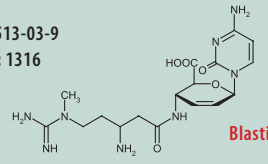
Blasticidin S . HCl

Bulk

ALX-380-089-M100 100 mg

Antibiotic. Isolated from *Streptomyces griseochromogenes.* Inhibitor of DNA and protein synthesis.

CAS: 3513-03-9
MI: **14:** 1316



Blasticidin S . HCl

Bleomycin sulfate

Bulk

ALX-630-107-M010 10 mg
ALX-630-107-M050 50 mg

A group of related glycopeptide antibiotics isolated from *Streptomyces verticillus.* Radiomimetic DNA-cleaving agent that produces double and single DNA strand breaks through an oxygen-radical-dependent mechanism. Inhibits intracellular DNA replication. DNA alkylating agent. Antineoplastic.

Borrelidin

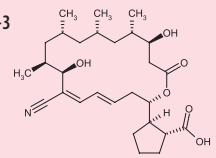
[Treponemycin; U-78548; C2989]

Bulk

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

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

CAS: 7184-60-3



Borrelidin

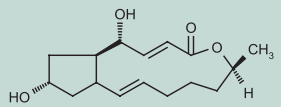
(+)-Brefeldin A

[BFA; Ascotoxin; Decumbin]

ALX-350-019-M005 5 mg
ALX-350-019-M010 10 mg
ALX-350-019-M025 25 mg
ALX-350-019-M050 50 mg

Isolated from *Eupenicillium brefeldianum.* Inhibitor of intracellular protein transport and protein secretion, interfering with trafficking in the trans-Golgi network, leading to the accumulation of cycling proteins in ERGIC clusters. Blocks ADP-ribosylation factor (Arf) in an inactive GDP-bound conformation and thereby prevents binding of COPI coats to ERGIC and Golgi membranes. Upon brefeldin A treatment the Golgi rapidly tubulates and fuses with the ER by an energy-, temperature-, and microtubule-dependent process. In contrast, the drug has little effect on the ERGIC, which keeps its identity, although the ERGIC clusters become larger and more uniformly distributed in the cytoplasm of the cells. Inhibits intracellular collagen degradation. Also inhibits apical Na^+ channels in epithelia. Induces apoptosis.

CAS: 20350-15-6
MI: **14:** 1369



(+)-Brefeldin A

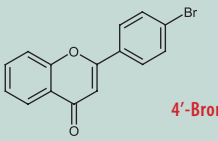
4-Bromo-A23189 see **A23187, 4-Bromo-**

4′-Bromoflavone

[4′-Bromo-2-phenylbenzopyran]

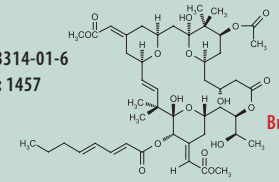
ALX-385-029-G001 1 g

Synthetic. Chemopreventive compound. Potent inducer of phase II detoxifying enzymes. Quininone reductase and glutathione S-transferase in cell culture and different tissues of rats. Aryl hydrocarbon hydroxylase inducer.



4′-Bromoflavone

CAS: 83314-01-6
MI: **14:** 1457



Bryostatin 1

Bryostatin 1

ALX-350-005-C010 10 µg

Binds to and activates protein kinase C (PKC). Antineoplastic.

Bufalin

ALX-350-281-M005 5 mg

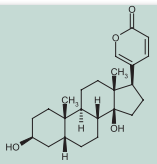
Isolated from *Bufonis venom.* Cardiotonic steroid specific Na^+/K^+-ATPase inhibitor. More potent than ouabain (Prod. No. ALX-350-066). Induces cell differentiation and apoptosis.

Bufotalin

ALX-350-282-M005 5 mg

Isolated from *Bufonis venom.* Less potent Na^+/K^+-ATPase inhibitor than other bufadienolides. Potent immunosuppressor.

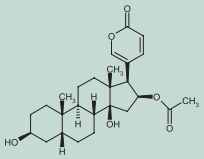
CAS: 465-21-4
MI: **14:** 1471



Bufalin

Technical Note Page 97

CAS: 471-95-4
MI: **14:** 1477



Bufotalin

Technical Note Page 97

α-Bungarotoxin

ALX-630-075-M001 1 mg

Isolated from *Bungarus multicinctus.* Post-synaptic neurotoxin that binds irreversibly to acetylcholine receptor sites, producing neuromuscular blockade and skeletal muscle paralysis. Prevents opening of nicotinic receptor-associated ion channels.

β-Bungarotoxin

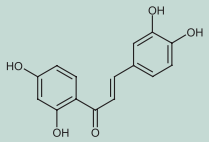
ALX-630-050-M001 1 mg

Isolated from *Bungarus multicinctus.* Presynaptic, neurotoxic phospholipase A2 (PLA2) activity.

H-Ile-Val-Cys-His-Thr-Thr-Ala-Thr-Ser-Pro-Ile-Ser-Ala-Val-Thr-Cys-Pro-Pro-Gly-Glu-Asn-Leu-Cys-Tyr-Arg-Lys-Met-Trp-Cys-Asp-Ala-Phe-Cys-Ser-Ser-Arg-Gly-Lys-Val-Val-Glu-Leu-Gly-Cys-Ala-Ala-Thr-Cys-Pro-Ser-Lys-Lys-Pro-Tyr-Glu-Glu-Val-Thr-Cys-Cys-Ser-Thr-Asp-Lys-Cys-Asn-Pro-His-Pro-Lys-Gln-Arg-Pro-Gly-OH (Disulfide bonds between Cys^3-Cys^{23}, Cys^{16}-Cys^{44}, Cys^{29}-Cys^{33}, Cys^{48}-Cys^{59} and Cys^{60}-Cys^{65})

α-Bungarotoxin

CAS: 487-52-5



Butein

Butein [2',3,4,4'-Tetrahydroxychalcone]

ALX-350-246-M010 10 mg

Plant polyphenol that acts as a specific tyrosine kinase inhibitor. Potently inhibits the tyrosine kinase activity of the EGF receptor and p60c-src. Potent antioxidant and anti-inflammatory agent. Inhibits glutathione reductase and rat liver glutathione S-transferase. Activator of human deacetylase SIRT1. Inhibits aromatase, showing chemopreventive properties. Directly inhibits IKK.

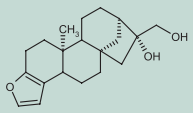
Cactinomycin see Actinomycin C

Cafestol

ALX-350-220-M050 50 mg

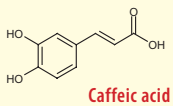
Isolated from the unsaponifiable fraction of petroleum ether extract of coffee beans. Inducer of glutathione S-transferases. Has chemoprotective activity, reducing the genotoxicity of several carcinogens.

CAS: 469-83-0
MI: **14:** 1634

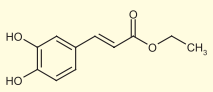


Cafestol

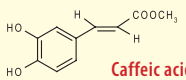
Technical Note Page 106



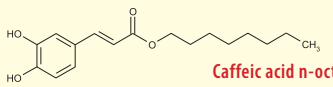
Caffeic acid



Caffeic acid ethyl ester



Caffeic acid methyl ester



Caffeic acid n-octyl ester

Technical Note Page 106

Caffeic acid [3-(3,4-Dihydroxyphenyl)-2-propenoic acid]

ALX-270-231-M250 250 mg
ALX-270-231-G001 1 g

Synthetic. Naturally occuring phenolic compound found in many fruits, vegetables and herbs, including coffee. Antitumor. Antiviral. Antioxidant. Anti-inflammatory. Inhibitor of 5- and 12-lipoxygenase (LO).

Caffeic acid ethyl ester [CAEE; Ethyl caffeate]

ALX-270-480-M050 50 mg
ALX-270-480-M250 250 mg

Synthetic. Shows anti-carcinogenic, anti-inflammatory, and immunomodulatory properties. Suppresses LPS-induced nitric oxide (NO) production. Potent and specific inhibitor of NF-κB and its downstream inflammatory mediators inducible nitric oxide synthase (iNOS; NOS II), prostagladin E_2 (PGE_2) and cyclooxygenase-2 (COX-2). Prevents DNA single-strand breaks caused by H_2O_2.

LIT: Inhibitory effects of caffeic acid ethyl ester on H2O2-induced cytotoxicity and DNA single-strand breaks in Chinese hamster V79 cells: T. Nakayama, et al.; Biosci. Biotechnol. Biochem. **60,** 316 (1996) ▪ Ethyl caffeate suppresses NF-kappaB activation and its downstream inflammatory mediators, iNOS, COX-**2,** and PGE2 in vitro or in mouse skin: Y.M. Chiang, et al.; Br. J. Pharmacol. **146,** 352 (2005) ▪ Drastic effect of several caffeic acid derivatives on the induction of heme oxygenase-1 expression revealed by quantitative real-time RT-PCR: K. Suzuki, et al.; Biofactors **28,** 151 (2006) ▪ Antitumor activity of some natural flavonoids and synthetic derivatives on various human and murine cancer cell lines: M. Cardenas, et al.; Bioorg. Med. Chem. **14,** 2966 (2006)

Caffeic acid methyl ester [Methyl caffeate]

ALX-350-226-M050 50 mg

Synthetic. Inhibitor of ornithine decarboxylase and protein tyrosine kinases. Has a strong inhibitory effect on human platelet aggregation. Shows antioxidant, antiproliferative and cytotoxic properties.

Caffeic acid n-octyl ester [n-Octylcaffeate]

ALX-350-278-M005 5 mg
ALX-350-278-M025 25 mg

More potent analog than CAPE (Prod. No. ALX-270-244). Suppressor of inducible nitric oxide synthase (iNOS; NOS II). Induces apoptosis.

LIT: Mechanism of toxicity of esters of caffeic and dihydrocaffeic acids: B. Etzenhouser, et al.; Bioorg. Med. Chem. **9,** 199 (2001) ▪ A novel antioxidant, octyl caffeate, suppression of LPS/IFN-gamma-induced inducible nitric oxide synthase gene expression in rat aortic smooth muscle cells: G. Hsiao, et al.; Biochem. Pharmacol. **65,** 1383 (2003) ▪ Caffeic acid derivatives: in vitro and in vivo anti-inflammatory properties: F.M. da Cunha, et al.; Free Radic. Res. **38,** 1241 (2004) ▪ Octylcaffeate induced apoptosis in human leukemia U937 cells: M. Ujibe, et al.; Biol. Pharm. Bull. **28,** 2338 (2005)

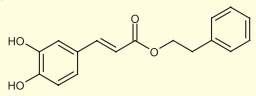
Caffeic acid phenylethyl ester

[CAPE; Phenethyl caffeiate] Bulk

ALX-270-244-M010 10 mg
ALX-270-244-M050 50 mg

Synthetic. Active component of propolis from honeybee hives, known to have anti-mitogenic, anti-carcinogenic, anti-inflammatory, and immunomodulatory properties. Potent and specific inhibitor of NF-κB activation, induced by TNF-α (Prod. No. ALX-522-008 (human) or Prod. No. ALX-522-009 (mouse)), PMA (Prod. No. ALX-445-004) and other inflammatory agents. Exhibits inhibitory activity against HIV-1 integrase. Suppresses lipid peroxidation and inhibits ornithine decarboxylase, protein tyrosine kinase and lipoxygenase activities. Induces apoptosis.

CAS: 115610-29-2



Caffeic acid phenylethyl ester

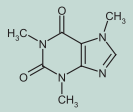
Caffeine

[1,3,7-Trimethylxanthine; 3-(3,4-Dihydroxyphenyl)-2-propenoic acid]

ALX-550-322-G005 5 g

Found in tea leaves, coffee beans, cocoa beans, maté leaves, guarana paste and kola nuts. CNS stimulant. Blocks adenosine A1 and A2A receptors. cAMP phosphodiesterase inhibitor. Interferes with the uptake and storage of Ca^{2+} by the sarcoplasmic reticulum in skeletal muscle. Prevents apoptosis and cell cycle effects induced by various chemicals. Inhibits cellular DNA repair mechanisms. Anti-inflammatory.

CAS: 58-08-2
MI: **14:** 1636



Caffeine

Technical Note Page 106

Calciferol see Vitamin D2

Calcimycin see A23187 (free acid)

Calcimycin, 4-Bromo- see 4-Bromo-A23187

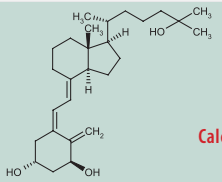
Calcitriol

[1α,25-Dihydroxyvitamin D3; 1α,25-Dihydroxycholecalciferol] Bulk

ALX-460-032-C100 100 µg
ALX-460-032-M001 1 mg

Osteotropic hormone that up-regulates RANKL level and down-regulates OPG level. Biologically active form of vitamin D3 in intestinal calcium transport and bone calcium resorption.

CAS: 32222-06-3
MI: **14:** 1644



Calcitriol

Calcium Ionophore A23187 see A23187 (free acid)

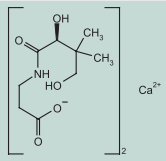
Calcium Ionophore A23187, 4-Bromo- see 4-Bromo-A23187

Calcium D-(+)-pantothenate

[D-(+)-Pantothenic acid hemicalcium salt]

ALX-460-003-G010 10 g

CAS: 137-08-6
MI: **14:** 7015



Calcium D-(+)-pantothenate

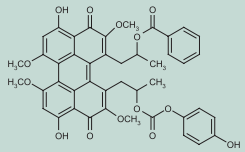
Calphostin C

[UCN-1028C]

ALX-350-027-C100 100 µg
ALX-350-027-M001 1 mg

Isolated from *Cladosporium cladosporioides*. Potent and selective inhibitor of the protein kinase C (PKC) regulatory site of diacylglycerol and phorbol esters. At higher concentrations inhibits myosin light chain kinase, cAMP-dependent protein kinase (PKA), protein kinase G and pp60v-src protein tyrosine kinase. Induces apoptotic DNA fragmentation and cell death. Kills breast cancer cells. Has antiviral potential. Inhibits cardiac L-type Ca^{2+} channels.

CAS: 121263-19-2



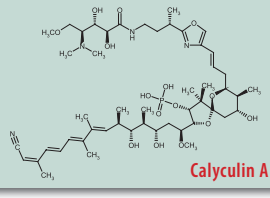
Calphostin C

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

Isolated from *Discodermia calyx*. Potent cell permeable inhibitor with high specificity for protein phosphatase 1 (PP1) and 2A (PP2A). Inhibits p130cas tyrosine phosphorylation. Enhances the phosphorylation level of NF-κB. Affects intracellular signalling processes that require 14-3-3. Potent non-phorbol type tumor promoter. Prevents γ-radiation induced apoptosis.

CAS: 101932-71-2



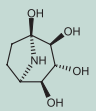
Calyculin A

(+)-Calystegine B2

ALX-350-314-M001 1 mg
ALX-350-314-M005 5 mg

Isolated from *Lycopersicon sp.* Selective glycosidase inhibitor sharing such activity with other hydroxylated nitrogen containing bicyclic compounds like swainsonine (Prod. No. ALX-350-077), castanospermine (Prod. No. ALX-270-160), monocyclic deoxynojirimycin (Prod. No. ALX-580-003) or fagomine. Most abundant form is calystegine B2 occurring in almost all plants displaying calystegines. Inhibitory potency of calystegine B2 is comparable to other alkaloidal glycosidase inhibitors showing K_i values below 1µM.

CAS: 127414-85-1



(+)-Calystegine B2

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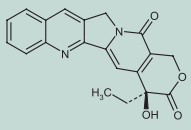
(S)-(+)-Camptothecin

ALX-350-015-M050 50 mg
ALX-350-015-M250 250 mg
ALX-350-015-G001 1 g

Isolated from *Mappia foetida* Miers *(Nothapodytes foetida (Wt.) Sleumer)*. Potent antitumor agent. Inhibitor of DNA-topoisomerase I. Activates p53 resulting in upregulated expression of TRAIL-R2 (DR5) and Bak to overcome TRAIL resistance in Bax-deficient human colon carcinoma cells. Suppresses nitric oxide (NO) biosynthesis.

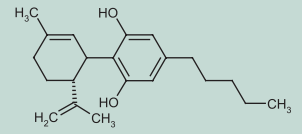
CAS: 7689-03-4
MI: **14:** 1735



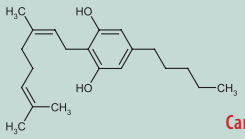
(S)-(+)-Camptothecin

Camptothecin, 9-[(Dimethylamino)methyl]-10-hydroxy-(20S)- see Topotecan

CAS: 13956-29-1
MI: **14:** 1747

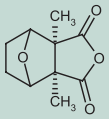


Cannabidiol



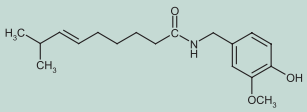
Cannabigerol

CAS: 56-25-7
MI: **14:** 1752



Cantharidin

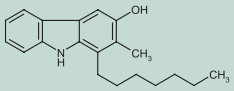
CAS: 404-86-4
MI: **14:** 1768



(E)-Capsaicin

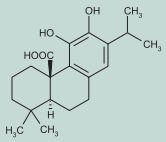
Technical Note Page 104

CAS: 126168-32-9



Carazostatin

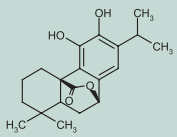
CAS: 3650-09-7



Carnosic acid

Technical Note Page 103

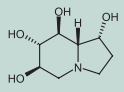
CAS: 5957-80-2



Carnosol

Technical Note Page 103

CAS: 79831-76-8
MI: **14:** 1896



Castanospermine

Canavanine . sulfate

[L-α-Amino-γ-(guanidinooxy)-n-butyric acid . sulfate]

ALX-350-002-M100 100 mg
ALX-350-002-M500 500 mg

The non-protein amino acid L-canavanine is an analog of L-arginine. Selective inducible nitric oxide synthase (iNOS; NOS II) inhibitor. Induces apoptotic cell death and shows antiproliferative and immunotoxic effects. ***Technical Note Page 104.***

Cannabidiol

[CBD]

ALX-430-152-M001 1 mg
ALX-430-152-M005 5 mg

Natural product. Non-psychotropic, anticonvulsive and neuroprotective *in vivo*. Shown to be a weak CB1 receptor antagonist and inhibitor of anandamide uptake. Weak agonist of TRPV1.

Cannabigerol

[CBG]

ALX-430-154-M001 1 mg
ALX-430-154-M005 5 mg

Natural product. Analog of cannabidiol (Prod. No. ALX-430-152) with similar pharmacological properties.

Cantharidin

ALX-270-063-M025 25 mg
ALX-270-063-M100 100 mg

Potent protein phosphatase 2A (PP2A) inhibitor. At higher concentrations, also inhibits protein phosphatase 1 (PP1).

CAPE see Caffeic acid phenylethyl ester

(E)-Capsaicin

[*trans*-8-Methyl-N-vanillyl-6-nonenamide]

Bulk

ALX-550-066-M100 100 mg

Isolated from *Capsicum* fruit. Constituent of cayenne pepper. Powerful excitant of peripheral sensory nerve endings, specifically unmyelinated afferent neurons (C-fibers). Elicits pain by activating TRPV1. Chemoprotective against some chemical carcinogens and mutagens. Reversibly inhibits aggregation of platelets.

Carazostatin

ALX-350-253-C100 100 µg
ALX-350-253-M001 1 mg

Isolated from *Streptomyces chrestomyceticus*. Antioxidant. Free radical scavenger. Potent inhibitor of lipid peroxidation.

Carbenicillin . 2Na

[α-Carboxybenzylpenicillin]

ALX-380-270-M250 250 mg
ALX-380-270-G001 1 g

Semisynthetic from penicillin. Analog to ampicillin (Prod. No. ALX-380-268). Inhibits bacterial cell-wall synthesis (peptidoglycan cross-linking) by inactivating transpeptidases on the inner surface of the bacterial cell membrane. Effective against Gram-positive and Gram-negative bacteria and Pseudomonas.

Carnosic acid

Bulk

ALX-270-264-M010 10 mg
ALX-270-264-M050 50 mg

Isolated from *Rosmarinus officinalis*. Naturally occurring phenolic compound with antioxidant properties. Inhibits lipid peroxidation induced by NADH or NADPH oxidation. Peroxisome proliferator-activated receptor γ (PPARγ) activator. Anti-inflammatory. Antimicrobial.

Carnosine

[β-Alanyl-L-histidine]

ALX-153-055-G001 1 g

Antioxidant. Inhibits soluble guanylyl cyclase (sGC) by interacting with the heme iron to form a chelate complex.

Carnosol

ALX-270-254-M001 1 mg
ALX-270-254-M005 5 mg

Isolated from *Rosmarinus officinalis*. Naturally occurring phenolic compound with antioxidant and anti-inflammatory properties. Suppresses nitric oxide NO production and inducible nitric oxide synthase (iNOS; NOSII) gene expression by inhibiting NF-κB activation. Inhibits lipid peroxidation. Antimicrobial. Anticarcinogenic. Inhibits cyclooxygenase-2 (COX-2).

β-Carotene

[Provitamin A]

ALX-460-004-G005 5 g

Synthetic.

Castanospermine

ALX-270-160-M010 10 mg
ALX-270-160-M050 50 mg

Isolated from *Castanospermum australe* seeds. Plant alkaloid. Potent inhibitor of α- and β-glucosidase activity in fibroblast extracts; inhibits the glycoprotein processing cycle. Exhibits antiviral properties. Prevents angiogenesis.

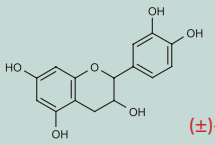
(±)-Catechin

[(±)-3,3′,4′,5,7-Flavanpentol]

ALX-385-002-G001 1 g

Antioxidant flavonoid. Free radical scavenger. Has chemopreventive and antitumor properties.

CAS: 7295-85-4
MI: **14:** 1902



(±)-Catechin

Technical Note Page 91

(+)-Catechin . H_2O

[(+)-3,3′,4′,5,7-Flavanpentol]

ALX-385-017-G001 1 g

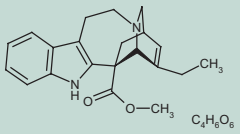
Antioxidant flavonoid. Free radical scavenger. Has chemopreventive and antitumor properties. For technical Information and literature references see (±)-Catechin (Prod. No. ALX-385-002). ***Technical Note Page 91.***

Catharanthine . tartrate

ALX-350-101-M100 100 mg
ALX-350-101-G001 1 g

Isolated from *Catharanthus roseus*. Starting material for the synthesis of the antitumor drugs vinblastine and vincristine. It is less active as an inhibitor of tubulin self-assembly into microtubules than the latter two compounds.

CAS: 2648-21-5
MI: **14:** 1904



Catharanthine . tartrate

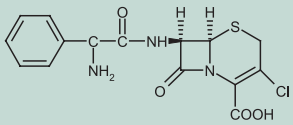
Cefaclor

[7-(D-2-Amino-2-phenylacetamido)-3-chloro-3-cephem-4-carboxylic acid]

ALX-380-016-M050 50 mg
ALX-380-016-M250 250 mg
ALX-380-016-G001 1 g
ALX-380-016-G005 5 g

Broad-spectrum antibiotic acting by inhibiting bacterial cell wall synthesis.

CAS: 53994-73-3
MI: **14:** 1912



Cefaclor

Cefazolin . Na

ALX-380-044-M250 250 mg
ALX-380-044-G001 1 g

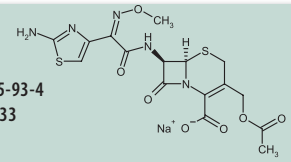
Semisynthetic. Inhibits synthesis of bacterial cell wall.

Cefotaxime . Na

ALX-380-271-M250 250 mg
ALX-380-271-G001 1 g

Cephalosporin antibiotic. Inhibits bacterial cell wall synthesis. Effective against Gram-negative and Gram-positive bacteria. Resistant against β-lactamase.

CAS: 64485-93-4
MI: **14:** 1933



Cefotaxime . Na

Celastrol

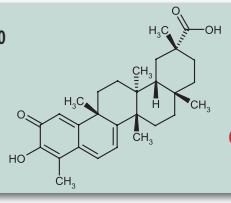
[Tripterine]

Bulk

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. Antioxidant. Suppresses LPS-induced cytokine release in macrophages and monocytes. Suppresses nitric oxide (NO) production and LPS-induced NF-κB activation. Inhibits chymotrypsin-like activity of 20S proteasome. Inhibits lipid peroxidation induced by ADP and Fe^{2+} in rat liver mitochondria. Induces expression of a wider set of heat shock proteins. Inhibits topoisomerase II.

CAS: 34157-83-0



Celastrol

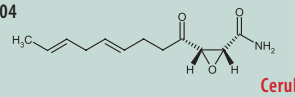
Cerulenin

[2,3-Epoxy-4-oxo-7,10-dodecadienamide]

ALX-380-053-M005 5 mg
ALX-380-053-M010 10 mg
ALX-380-053-M050 50 mg

Antibiotic. Isolated from *Cephalosporium caerulens*. Fatty acid synthase (FAS) inhibitor reported to bind in equimolar ratio to β-keto-acyl-ACP synthase, thus inhibiting protein acylation. Produces metabolic effects similar to effects of leptin, but through mechanisms that are independent of, or down-stream from, both leptin and melanocortin receptors. Apoptosis inducer. Inhibitor of bacterial fatty acid synthesis (inhibits FabH, FabB and FabF condensation enzymes).

CAS: 17397-89-6
MI: **14:** 2004



Cerulenin

Ceruloplasmin (human)

[Ferroxidase]

ALX-200-089-M001 1 mg

Isolated from human plasma. Serum copper transport and iron-oxidizing protein. Expressed in plasma at concentrations of 1-5μM. Contains six copper centers and is known to oxidize amines in a process coupled to the reduction of molecular oxygen. Has ferroxidase activity that is responsible for the oxidation of ferrous iron to its ferric form, which is necessary for efficient iron efflux from the cell (e.g. during hypoxia). Has previously been considered a target for nitric oxide (NO) and an inhibitor of endothelial nitric oxide synthase (eNOS/NOS III). Catalyzes S-nitrosothiol formation in cell culture media. Is a NO oxidase and nitrite synthase that determines endocrine NO homeostasis.

CGP 41251 see PKC412

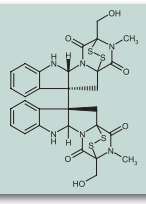
Chaetocin (high purity)

[Chetocin]

ALX-380-242-M001 1 mg

Antibiotic. Isolated from *Chaetomium sp.* MST-FP2085. Antitumor agent. Specific inhibitor of the lysine-specific methyltransferase SU(VAR)3-9 both *in vitro* and *in vivo*.

CAS: 28097-03-2



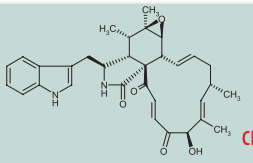
Chaetocin

Chaetoglobosin A

ALX-350-131-M001 1 mg
ALX-350-131-M005 5 mg

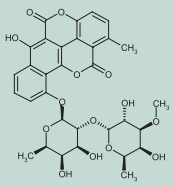
Isolated from *Chaetomium sp.* Cytochalasin analog with anti-fungal activity. Phytotoxic and anti-bacterial activity. Exhibits cytotoxic effects against human cancer cell lines. Enhances fibrinolytic activity of bovine aortic endothelial cells.

Chaetomin see Chetomin



Chaetoglobosin A

CAS: 6377-18-0
MI: 14: 2045



Chartreusin

Chartreusin [Lambdamycin]

ALX-380-073-M005 5 mg
ALX-380-073-M025 25 mg

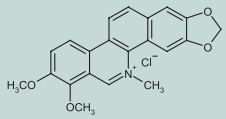
Isolated from *Streptomyces chartreusis.* Antitumor antibiotic which inhibits topoisomerase II. Induces single-strand scission in DNA in the presence of reducing agents.

Charybdotoxin

ALX-630-059-C100 100 µg

Synthetic. Highly potent blocker of a variety of Ca^{2+}-activated K^+-channels in a wide range of cell types. Acts in nanomolar concentration and does not affect apamin-sensitive channels.

CAS: 3895-92-9
MI: 14: 2051



Chelerythrine chloride

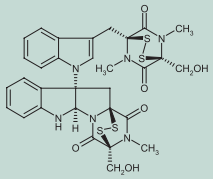
Chelerythrine chloride

Bulk

ALX-350-008-M001 1 mg
ALX-350-008-M005 5 mg
ALX-350-008-M025 25 mg

Synthetic. Potent, selective and cell permeable protein kinase C (PKC) inhibitor. Induces apoptosis. BH3 mimetic which inhibits Bcl_{XL} function.

CAS: 1403-36-7



Chetomin

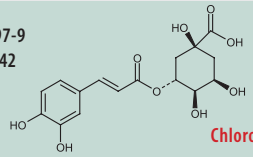
Chetomin [Chaetomin]

Bulk

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. Antibacterial.

CAS: 327-97-9
MI: 14: 2142



Chlorogenic acid

Technical Note Page 106

Chlorogenic acid [3-O-Caffeoylquinic acid; Heriguard; NSC 407296]

ALX-350-353-M500 500 mg
ALX-350-353-G001 1 g

Isolated from the leaves and fruits of *dicotyledonous* plants (e.g. coffee beans). Analog of caffeic acid (Prod. No. ALX-270-231). Shows antioxidant, analgesic, antipyretic and chemopreventive activity. Inhibits Bcr-Abl tyrosine kinase and triggers MAP kinases p38-dependent apoptosis. Inhibitor of the tumor promoting activity of phorbol esters.

Chlorotoxin acid, Iso- see 3,5-Di-O-caffeoylquinic acid

Chlorotoxin

ALX-630-069-C500 500 µg

Synthetic. Small conductance Cl^- channel blocker. Highly specific marker for glioma cells and tumors of neuroectodermal origin. Inhibits the activity of matrix metalloproteinase-2 (MMP-2).

H-Met-Cys-Met-Pro-Cys-Phe-Thr-Thr-Asp-His-Gln-Met-Ala-Arg-Lys-Cys-Asp-Asp-Cys-Cys-Gly-Gly-Lys-Gly-Arg-Gly-Lys-Cys-Tyr-Gly-Pro-Gln-Cys-Leu-Cys-Arg-NH_2 (Disulfide bonds between Cys^2-Cys^{19}, Cys^5-Cys^{28}, Cys^{16}-Cys^{33} and Cys^{20}-Cys^{35})

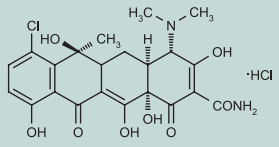
Chlorotoxin

Chlortetracycline . HCl [Aureomycin . HCl]

ALX-350-238-G001 1 g
ALX-350-238-G005 5 g

Antibiotic. Isolated from *Streptomyces aureofaciens.* Inhibits protein synthesis in prokaryotes and eukaryotes. Inhibits binding of aminoacyl-tRNA to ribosomes. Used as a fluorescent Ca^{2+} probe.

CAS: 64-72-2
MI: 14: 2192



Chlortetracycline . HCl

Cholecalciferol see Vitamin D3

Chromomycin A_3 [Toyomycin]

ALX-380-055-M005 5 mg
ALX-380-055-M025 25 mg

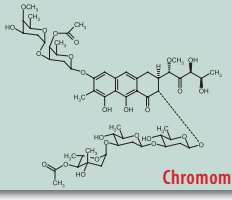
Antibiotic. Isolated from *Streptomyces griseus.* Inhibits RNA synthesis. Cell permeable fluorescent dye that can be used with bisbenzimide H33258 (Prod. No. ALX-620-051) to distinguish chromosomes by their total DNA concentration and their DNA base composition. Binds to G:C pairs of helical DNA but does not intercalate. Ex(max): 445nm; Em(max): 575nm.

Chrysin [5,7-Dihydroxyflavone]

ALX-385-009-G001 1 g

Antibiotic. Antioxidant flavonoid. Shows anti-inflammatory and antitumor properties. Inhibits hypoxia-inducible factor-1α (HIF-1α). Induces apoptosis.

CAS: 7059-24-7
MI: 14: 2238

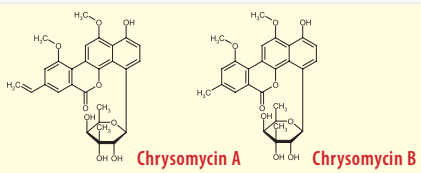


Chromomycin A_3

Chrysomycin A [Chrysomycin V; Virenomycin V]

ALX-380-112-C250 250 µg
ALX-380-112-M001 1 mg

Antibiotic. Isolated from *Streptomyces sp.* Inhibits topoisomerase II in human. Mediates a unique cross-linking reaction between DNA and histidine H3. Antineoplastic and photosensitizing compound. Exhibits antitumor activity against human cell lines.



Chrysomycin A Chrysomycin B

Chrysomycin B [Chrysomycin M; Virenomycin M]

ALX-380-114-C250 250 µg
ALX-380-114-M001 1 mg

For technical information see product Chrysomycin A (Prod. No. ALX-380-112).

Chrysomycin M see Chrysomycin B

Chrysomycin V see Chrysomycin A

CI-920 see Fostriecin

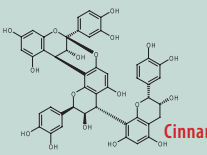
Cinnamtannin B-1

[Epicatechin-(4β→8,2β→0→7)-epicatechin-(4α→8)-epicatechin]

ALX-350-365-M005 5 mg

Isolated from *Laurus nobilis L.* A-type proanthocyanidin contained in several plant species such as Laurus nobilis *L., Vaccinium vitis-idaea, Parameria laevigata, Cinnamomum zeylanicum* and *Lindera umbellata.* Has potent antioxidant activity. Protective agent against oxidative stress and apoptosis in human platelets. Reduces hyperaggregability in platelets from type 2 diabetic patients.

CAS: 88082-60-4



Cinnamtannin B-1

Technical Note Page 108

Cinobufagin

ALX-350-283-M005 5 mg

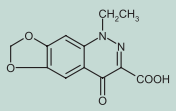
Specific Na^+/K^+-ATPase inhibitor. About as active as ouabain (Prod. No. ALX-350-066). ***Technical Note Page 97.***

Cinobufotalin

ALX-350-284-M005 5 mg

Specific Na^+/K^+-ATPase inhibitor. Less active than ouabain (Prod. No. ALX-350-066). ***Technical Note Page 97***.

CAS: 28657-80-9
MI: **14:** 2309



Cinoxacin

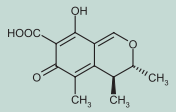
Cinoxacin

Bulk

ALX-380-017-M050 50 mg
ALX-380-017-M250 250 mg

Analog of oxolinic acid. Antibacterial quinolone.

CAS: 518-75-2
MI: **14:** 2327



Citrinin

Technical Note Page 109

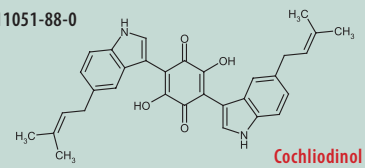
Citrinin

[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

Antibiotic. Isolated from *Penicillium citrinum.* Induces mitochondrial permeability pore opening and inhibits respiration by interfering with complex I of the respiratory chain. Acts as nephrotoxin in all species in which it has been tested. Mycotoxin. Has been implicated as a cause of Balkan nephropathy and yellow rice fever in humans. Induces apoptosis.

CAS: 11051-88-0



Cochliodinol

Cochliobolin see Ophiobolin

Cochliodinol

ALX-350-316-MC05 0.5 mg

Antibiotic. Isolated from *Chaetomium globosum.* Displays antibacterial and antitumor activity.

Cochlioquinone A

[Luteoleersin]

ALX-350-335-MC05 0.5 mg

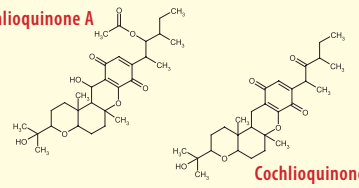
Isolated from *Bipolaris leersia* MST-FP107. Shows antiangiogenic and nematocidal activities. Antagonist of the human chemokine receptor CCR5 in human immunodeficiency virus type 1 (HIV-1). Inhibitor of diacylglycerol acyltransferase, diacylglycerol kinase and NADH-ubiquinone reductase.

Cochlioquinone B

ALX-350-341-MC05 0.5 mg

Isolated from *Bipolaris leersia* MST-FP107. 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.

Cochlioquinone A



Cochlioquinone B

Coenzyme Q1 see Ubiquinone-5

Coenzyme Q2 see Ubiquinone-10

Colcemid

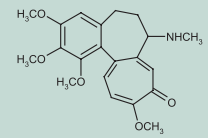
[Demecolcine]

Bulk

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

Semisynthetic from colchicine (Prod. No. ALX-380-033). Depolymerizes microtubules and inhibits their formation. Induces apoptosis.

CAS: 477-30-5
MI: **14:** 2887



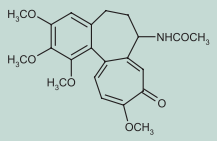
Colcemid

Colchicine

ALX-380-033-G001 1 g

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

CAS: 64-86-8
MI: **14:** 2471



Colchicine

Colforsin see Forskolin

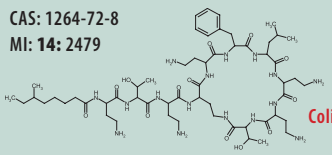
Colistin . sulfate

[Polymyxin E]

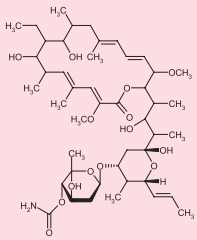
ALX-380-272-M500 500 mg

Isolated from *Bacillus colistinus.* Polymyxin antibiotic. Binds to lipids on the cell cytoplasmic membrane. Disrupts cell wall integrity. Effective against Gram-negative bacteria.

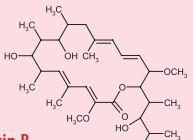
CAS: 1264-72-8
MI: **14:** 2479



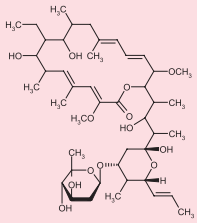
Colistin . sulfate



Concanamycin A



Concanamycin B



Concanamycin C

The Concanamycin Source™

Concanamycin A

[Folimycin] Bulk

ALX-380-034-C025	25 µg
ALX-380-034-C100	100 µg
ALX-380-034-M001	1 mg

Antibiotic. Isolated from *Streptomyces sp.* More potent and specific H^+-ATPase inhibitor than bafilomycin A1 (Prod. No. ALX-380-030). Inhibits acidification of organelles such as lysosomes and the Golgi apparatus. Blocks cell surface expression of viral glycoproteins without effecting their synthesis. Exhibits cytotoxic effects in a number of cell lines in a cell viability assay. Induces nitric oxide (NO) production.

Concanamycin B

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

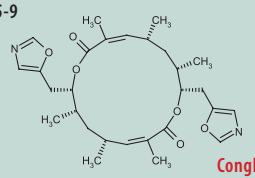
Antibiotic. Isolated from *Streptomyces sp.* Exhibits similar activity as concanamycin A (Prod. No. ALX-380-034) and C (Prod. No. ALX-380-099). Specific inhibitor of vacuolar-type H^+-ATPase. Suppresses bone resorption *in vitro*. Inhibits proliferation of mouse splenic lymphocytes. Shows antifungal and larvicidal properties.

Concanamycin C

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

Antibiotic. Isolated from *Streptomyces sp.* Inhibits vacuolar H^+-ATPase. Potential antiosteoporotic agent. Shows antiviral and immunosuppressive activity. Active against fungi and yeasts.

CAS: 72263-05-9



Conglobatin

Conglobatin

ALX-380-225-MC05 0.5 mg

Isolated from *Streptomyces conglobatus* MST-AS5530. Macrolide antibiotic with an unusual dimeric macrolide dilactone structure. Exhibited immunosuppressant activity in a NFAT-dependent transcription assay (IC_{50}=0.63µg/ml).

H-Glu-Cys-Cys-Asn-Pro-Ala-Cys-Gly-Arg-His-Tyr-Ser-Cys-NH_2 (Disulfide bonds between Cys^2-Cys^7 and Cys^3-Cys^{13})

α-Conotoxin GI

α-Conotoxin GI

ALX-630-046-C500 500 µg

Synthetic. Originally isolated from *Conus geographus*. Neurotoxin. Postsynaptic inhibitor at the neuromuscular junction. Selective antagonist of neuromuscular or neuronal nicotinic acetylcholine receptors. Not for sale in U.S.A.

H-Gly-Arg-Cys-Cys-His-Pro-Ala-Cys-Gly-Lys-Asn-Tyr-Ser-Cys-NH_2 (Disulfide bonds between Cys^3-Cys^8 and Cys^4-Cys^{14})

α-Conotoxin MI

α-Conotoxin MI

ALX-630-048-C500 500 µg

Synthetic. Originally isolated from *Conus magus*. Neurotoxin. Postsynaptic inhibitor at the neuromuscular junction. Selective antagonist of neuromuscular or neuronal nicotinic acetylcholine receptors. Not for sale in U.S.A.

H-Ile-Cys-Cys-Asn-Pro-Ala-Cys-Gly-Pro-Lys-Tyr-Ser-Cys-NH_2 (Disulfide bonds between Cys^2-Cys^7 and Cys^3-Cys^{13})

α-Conotoxin SI

α-Conotoxin SI

ALX-630-049-C500 500 µg

Synthetic. Originally isolated from *Conus striatus*. Neurotoxin. Postsynaptic inhibitor at the neuromuscular junction. Selective antagonist of neuromuscular or neuronal nicotinic acetylcholine receptors. Not for sale in U.S.A.

H-Arg-Asp-Cys-Cys-Thr-Hyp-Hyp-Arg-Lys-Cys-Lys-Asp-Arg-Arg-Cys-Lys-Hyp-Met-Lys-Cys-Cys-Ala-NH_2 (Disulfide bonds between Cys^3-Cys^{15}, Cys^4-Cys^{20} and Cys^{10}-Cys^{21})

µ-Conotoxin GIIIB

µ-Conotoxin GIIIB

ALX-630-054-C500 500 µg

Synthetic. Originally isolated from *Conus geographus*. Neurotoxin. Specific blocker of the skeletal voltage-gated Na^+ channels. Not for sale in U.S.A.

H-Ala-Cys-Ser-Gly-Arg-Gly-Ser-Arg-Cys-Hyp-Hyp-Gln-Cys-Cys-Met-Gly-Leu-Arg-Cys-Gly-Arg-Gly-Asn-Pro-Gln-Lys-Cys-Ile-Gly-Ala-His-Gla-Asp-Val-OH (Disulfide bonds between Cys^2-Cys^{14}, Cys^9-Cys^{19} and Cys^{13}-Cys^{27}) (Gla = L-γ-Carboxyglutamic acid)

µ-Conotoxin GS

µ-Conotoxin GS

ALX-630-047-C500 500 µg

Synthetic. Originally isolated from *Conus geographus*. Neurotoxin. Na+ channel blocker. Not for sale in U.S.A.

H-Cys-Lys-Ser-Hyp-Gly-Ser-Ser-Cys-Ser-Hyp-Thr-Ser-Tyr-Asn-Cys-Cys-Arg-Ser-Cys-Asn-Hyp-Tyr-Thr-Lys-Arg-Cys-Tyr-NH_2 (Disulfide bonds between Cys^1-Cys^{16}, Cys^8-Cys^{19} and Cys^{15}-Cys^{26})

ω-Conotoxin GVIA

ω-Conotoxin GVIA

ALX-630-055-C500 500 µg

Synthetic. Originally isolated from *Conus geographus*. Neurotoxin. Potent and selective blocker of neuronal N-type, voltage-dependent Ca^{2+} channels. Not for sale in U.S.A.

H-Cys-Lys-Gly-Lys-Gly-Ala-Lys-Cys-Ser-Arg-Leu-Met-Tyr-Asp-Cys-Cys-Thr-Gly-Ser-Cys-Arg-Ser-Gly-Lys-Cys-NH_2 (Disulfide bonds between Cys^1-Cys^{16}, Cys^8-Cys^{20} and Cys^{15}-Cys^{25})

ω-Conotoxin MVIIA

ω-Conotoxin MVIIA

ALX-630-056-C500 500 µg

Synthetic. Originally isolated from *Conus magus*. Neurotoxin. Selectively and reversibly blocks the n-type, voltage gated Ca^{2+} channels. Not for sale in U.S.A.

ω-Conotoxin MVIIC

ALX-630-057-C100 100 µg

Synthetic. Originally isolated from *Conus magus*. Neurotoxin. Potent and selective blocker of P/Q-type, voltage-gated Ca^{2+} channels. Not for sale in U.S.A.

ω-Conotoxin SVIB

ALX-630-053-C500 500 µg

Synthetic. Originally isolated from *Conus striatus*. Neurotoxin. N-Type Ca^{2+} channel blocker. Not for sale in U.S.A.

H-Cys-Lys-Gly-Lys-Gly-Ala-Pro-Cys-Arg-Lys-Thr-Met-Tyr-Asp-Cys-Cys-Ser-Gly-Ser-Cys-Gly-Arg-Arg-Gly-Lys-Cys-NH_2 (Disulfide bonds between Cys^1-Cys^{16}, Cys^8-Cys^{20} and Cys^{15}-Cys^{26})

ω-Conotoxin MVIIC

H-Cys-Lys-Leu-Lys-Gly-Gln-Ser-Cys-Arg-Lys-Thr-Ser-Tyr-Asp-Cys-Cys-Ser-Gly-Ser-Cys-Gly-Arg-Ser-Gly-Lys-Cys-NH_2 (Disulfide bonds between Cys^1-Cys^{16}, Cys^8-Cys^{20} and Cys^{15}-Cys^{26})

ω-Conotoxin SVIB

Convulxin

ALX-350-100-C050 50 µg

Isolated from *Crotalus durissus* terrificus snake venom. Heterodimeric C-type lectin. Activates mammalian platelets via binding and clustering of p62/GPVI-receptors under physiological conditions.

Cord Factor see Trehalose 6,6′-dimycolate

Croton oil

Bulk

ALX-350-089-K001 1 kg

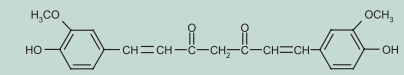
Natural source of phorbol and phorbol esters, purified from *Croton tiglium L.*

Curcumin (high purity)

Bulk

ALX-350-028-M010 10 mg
ALX-350-028-M050 50 mg
ALX-350-028-M250 250 mg

CAS: 458-37-7
MI: **14:** 2673



Curcumin

Technical Note Page 86

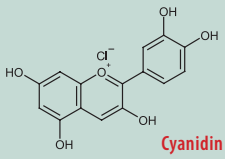
Cyanidin chloride

[3,3′,4′,5,7-Pentahydroxy-flavylium chloride]

ALX-385-003-M010 10 mg
ALX-385-003-M050 50 mg

Antioxidant flavonoid. Nitric oxide (NO) scavenger.

CAS: 528-58-5
MI: **14:** 2687



Cyanidin chloride

Technical Note Page 108

Cycloheximide

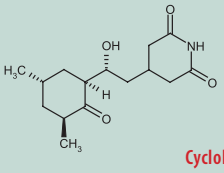
[Actidione; Naramycin A]

Bulk

ALX-380-269-G001 1 g
ALX-380-269-G005 5 g

Antibiotic. Isolated from *Streptomyces griseus*. Inhibits translation in eukaryotes resulting in cell growth arrest and cell death. Induces apoptosis in tumor cell lines. Widely used for selection of resistant strains of yeast and fungi, controlled inhibition of protein synthesis for detection of short-lived proteins and super-induction of protein expression.

CAS: 66-81-9
MI: **14:** 2728



Cycloheximide

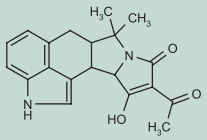
Cyclopiazonic acid

[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. ***Technical Note Page 109.***

CAS: 18172-33-3



Cyclopiazonic acid

Panel of Cyclosporins

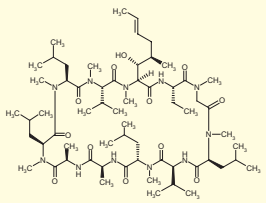
Cyclosporin A

[CSA]

Bulk

ALX-380-002-M100	100 mg	ALX-380-002-G001	1 g
ALX-380-002-5100	5 x 100 mg	ALX-380-002-5001	5 x 1 g

Antibiotic. Isolated from *Fusarium solani*. Potent immunosuppressor. Widely used after organ transplantation. Binds to cytosolic proteins of the cyclophilin family. Cyclosporin A-cyclophilin complexes block protein phosphatase 2B (calcineurin; PP2B), a key enzyme in T cell activation. As a result of calcineurin inhibition, cyclosporine A blocks various cellular processes such as activation of T cells and expression of several lymphokines (especially IL-2). Inhibits cytochrome c release from mitochondria. Inhibits nitric oxide (NO) synthesis.



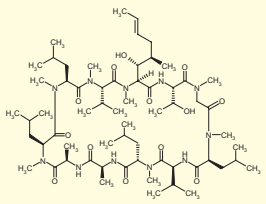
Cyclosporin A

Cyclosporin C

[Thr^2-cyclosporin A]

ALX-380-282-M001 1 mg
ALX-380-282-M005 5 mg

Isolated from *Fusarium solani*. Potent immunosuppressor.



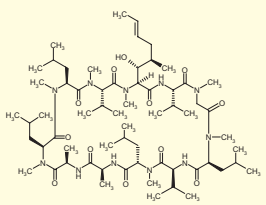
Cyclosporin C

Cyclosporin D

[Val^2-cyclosporin A; 7-L-Valine-cyclosporin A]

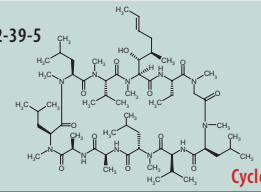
ALX-380-284-M001 1 mg
ALX-380-284-M005 5 mg

Isolated from *Fusarium solani*. Weak immunosuppressor. Potent inhibitor of tumor promoting phorbol ester TPA/PMA (Prod. No. ALX-445-004) *in vivo*. Potent inhibitor of Ca^{2+}/calmodulin dependent EF-2 phosphorylation *in vitro*.



Cyclosporin D

CAS: 83602-39-5



Cyclosporin H

Cyclosporin H

[Thr^2-cyclosporin A; 5-(N-Methyl-D-valine)-cyclosporin A]

ALX-380-286-M001 1 mg
ALX-380-286-M005 5 mg

Isolated from *Fusarium solani*. Immunologically inactive. Does not bind to immunophilin. Potent inhibitor of tumor promoting phorbol ester TPA/PMA (Prod. No. ALX-445-004) in mouse skin *in vivo*. Potent inhibitor of Ca^{2+}/calmodulin dependent EF-2 phosphorylation *in vitro*. Potent and selective antagonist of formyl peptide receptor. Inhibits formyl peptide-induced superoxide formation.

CAS: 68-41-7

D-Cycloserine

D-Cycloserine

[R(+)-4-Amino-3-isoxazolidinone]

ALX-106-028-M050 50 mg
ALX-106-028-M250 250 mg

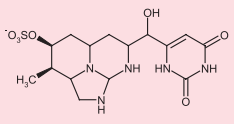
Synthetic. Excitatory amino acid. Partial agonist at the glycine site of the NMDA receptor.

L-Cycloserine

[S(-)-4-Amino-3-isoxazolidinone]

ALX-106-037-M025 25 mg
ALX-106-037-M100 100 mg

Excitatory amino acid. Inhibitor of ketosphinganine synthase (serine-palmitoyl-CoA transferase, EC 2.3.1.50), leading to blockade of sphingosine biosynthesis. Partial agonist at the glycine modulatory site of the NMDA receptor.



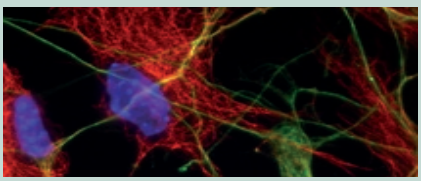
Cylindrospermopsin

Technical Note Page 90

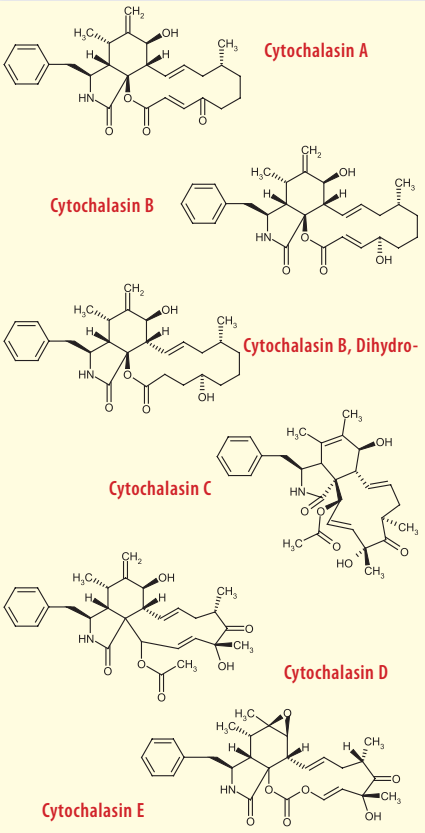
Cylindrospermopsin

ALX-350-149-C025 25 µg
ALX-350-149-C100 100 µg

Isolated from *Cylindrospermopsis raciborskii*. Tricyclic alkaloid hepatotoxin. Exhibits a completely different mechanism of toxicity than microcystins. Protein synthesis inhibitor. Might be carcinogenic. Inhibits pyrimidine nucleotide synthesis.



Wide Panel of Cytochalasins



Technical Note Page 109

Cytochalasin A

ALX-380-057-M001 1 mg
ALX-380-057-M005 5 mg
ALX-380-057-M010 10 mg

Antibiotic. Isolated from *Helminthosporium dematioideum*. Fungal toxin. Inhibits glucose transport, actin polymerisation and blocks the formation of microtubuli. Inhibits cell division. Inhibits HIV-1 protease.

Cytochalasin B

[Phomin]

ALX-380-012-M001 1 mg
ALX-380-012-M005 5 mg
ALX-380-012-M025 25 mg

Antibiotic. Isolated from *Drechslera dematoidea*. Cell permeable mycotoxin. Inhibits cytoplasmic division by blocking the formation of contractile microfilaments. Shortens actin filaments by blocking monomer addition at the fast-growing end of polymers. Inhibits glucose transport and platelet aggregation. Blocks adenosine-induced apoptotic body formation without affecting activation of endogenous ADP-ribosylation in leukemia HL-60 cells.

Cytochalasin B, Dihydro-

[Dihydrocytochalasin B]

ALX-350-053-M001 1 mg

Semisynthetic. Derived from cytochalasin B (Prod. No. ALX-380-012), which was isolated from *Drechslera dematoidea*. Used as tool in cytological research and in characterization of polymerization properties of actin.

Cytochalasin C

ALX-380-069-M001 1 mg
ALX-380-069-M005 5 mg

Antibiotic. Isolated from *Meterrhizium anisopliae*. Disrupts the actin microfilament cytoskeleton and inhibits the cytoplasmic dividing of a cell. Has been found to be ten times less toxic in mice than cytochalasin D (Prod. No. ALX-380-031) but with essentially the same biological effectiveness against cells in culture.

Cytochalasin D

ALX-380-031-M001 1 mg
ALX-380-031-M005 5 mg

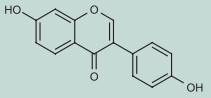
Antibiotic. Isolated from *Zygosporium mansonii*. Cytochalasin D is ~10-fold more potent than cytochalasin B (Prod. No. ALX-380-012) in inhibiting actin filament function, but does not inhibit sugar transport in cells. Inactivates low conductance K^+ channels. Modulates CD4 cross-linking in T-lymphocytes and increases intracellular Ca^{2+} levels. Exhibits antitumor activity. Induces apoptosis.

Cytochalasin E

ALX-380-062-M001 1 mg
ALX-380-062-M005 5 mg

Antibiotic. Isolated from *Aspergillus clavatus*. Inhibits angiogenesis and tumor growth. Depolymerizes actin filaments.

CAS: 486-66-8
MI: **14:** 2801



Daidzein

Technical Note Page 107

Dactinomycin see **Actinomycin D**

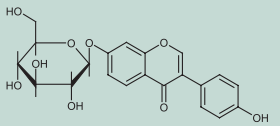
Daidzein

[4',7-Dihydroxyisoflavone]

ALX-350-009-M010 10 mg
ALX-350-009-M025 25 mg
ALX-350-009-M050 50 mg

Synthetic. Inactive analog of the tyrosine kinase inhibitor genistein (Prod. No. ALX-350-006). Shows anti-inflammatory effect.

CAS: 552-66-9
MI: **14:** 2801



Daidzin

Technical Note Page 107

Daidzein-7-O-glucoside see **Daidzin**

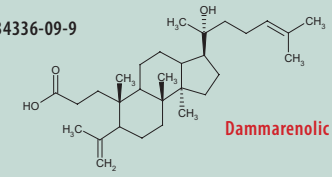
Daidzin

[Daidzein-7-O-glucoside]

ALX-350-248-M002 2 mg
ALX-350-248-M010 10 mg

Glucoside of the isoflavone daidzein (Prod. No. ALX-350-009) found in soy beans.

CAS: 34336-09-9



Dammarenolic acid

Dammarenolic acid

ALX-350-155-M005 5 mg

Isolated from *Aglaia sp.* Dammarane triterpene. Shows antiviral activity with relatively low cytotoxicity.

Daunomycin see **Daunorubicin**

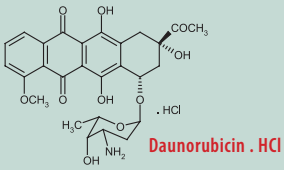
Daunorubicin . HCl

[Daunomycin . HCl]

ALX-380-043-M010 10 mg

Anthracycline anticancer antibiotic. Induces DNA damage by intercalating into DNA and inhibiting topoisomerase I and II. Inhibits RNA and DNA synthesis. Induces DNA single strand breaks and apoptosis in tumor cells.

CAS: 23541-50-6
MI: **14:** 2832



Daunorubicin . HCl

Daunorubicin, 4-Demethoxy- see **Idarubicin . HCl**

10-Deacetyl baccatin III see **Baccatin III, 10-Deacetyl-**

Debromohymenialdisine

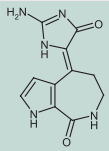
[DBH]

ALX-350-290-C100 100 µg

Isolated from sponge *Stylotella aurantium*. Inhibitor of G2 DNA damage checkpoint and check point kinases 1 (Chk1) and 2 (Chk2). Unlike other checkpoint inhibitors DBH does not inhibit ataxia-telangiectasia mutated (ATM) or ATM-Rad3-related protein. Also inhibits MAP kinase kinase 1 (MEK-1) but is not as potent as 10Z-hymenialdisine (Prod. No. ALX-350-289).

LIT: Inhibition of the G2 DNA damage checkpoint and of protein kinases Chk1 and Chk2 by the marine sponge alkaloid debromohymenialdisine: D. Curman, et al.; J. Biol. Chem. **276,** 17914 (2001) ▪ Aldisine alkaloids from the Philippine sponge Stylissa massa are potent inhibitors of mitogen-activated protein kinase kinase-1 (MEK-1): D. Tasdemir, et al.; J. Med. Chem. **45,** 529 (2002) ▪ G2 checkpoint abrogators as anticancer drugs: T. Kawabe; Mol. Cancer Ther. **3,** 513 (2004)

CAS: 125118-55-0



Debromohymenialdisine

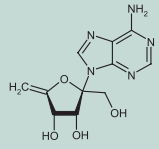
Decoyinine

[U-7984; Angustmycin A]

ALX-380-032-M001 1 mg
ALX-380-032-M005 5 mg

Antibiotic. Isolated from *Streptomyces sp.* Nucleoside antibiotic. Antitumor compound. Inhibitor of xanthosin monophosphate (XMP) aminase. Inhibitor of RNA synthesis. Specific inhibitor of GMP synthase. Reduces intracellular GTP levels.

CAS: 2004-04-8



Decoyinine

Decumbin see **(+)-Brefelidin A**

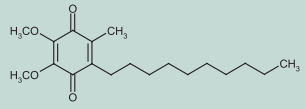
Decylubiquinone

[2,3-Dimethoxy-5-methyl-6-decyl-1,4-benzoquinone]

ALX-270-293-M010 10 mg

Inhibitor of the mitochondrial permeability transition pore (MPTP). This inhibitory effect can be counteracted by ubiquinone-5 (Prod. No. ALX-270-294).

CAS: 55486-00-5



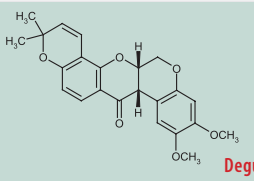
Decylubiquinone

Deguelin

ALX-350-118-M005 5 mg
ALX-350-118-M025 25 mg

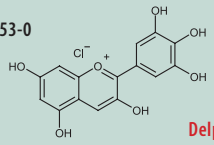
Inhibitor of Akt (protein kinase B; PKB) in an *in vitro* lung carcinogenesis progression model. Inhibits cell proliferation - cells accumulate in the G2-M phase of the cell cycle. Induces apoptosis. Exhibits a marked inhibitory effect on mouse skin tumor promotion in an *in vivo* two-stage carcinogenesis test. Inhibits cyclooxygenase-2 (COX-2) expression.

CAS: 522-17-8
MI: **14:** 2863



Deguelin

CAS: 528-53-0



Delphinidin chloride

Technical Note Page 108

Delphinidin chloride (high purity)

ALX-385-028-M010 10 mg

Anthocyanidin with antioxidant effect found in pigmented fruits and vegetables. Shown to inhibit angiogenesis and endothelial cell apoptosis by stimulating nitric oxide (NO) production. Inhibits solar radiation (UVB)-mediated oxidative stress, reducing DNA damage.

LIT: Delphinidin, an active compound of red wine, inhibits endothelial cell apoptosis via nitric oxide pathway and regulation of calcium homeostasis: S. Martin, et al.; Br. J. Pharmacol. **139,** 1095 (2003) ▪ Anthocyanins induce cell cycle perturbations and apoptosis in different human cell lines: M.C. Lazzè; Carcinogenesis **25,** 1427 (2004) ▪ DNA interaction with naturally occurring antioxidant flavonoids quercetin, kaempferol, and delphinidin: C.D. Kanakis, et al.; J. Biomol. Struct. Dyn. **22,** 719 (2005) ▪ Delphinidin, a dietary anthocyanidin, inhibits vascular endothelial growth factor receptor-2 phosphorylation: S. Lamy, et al.; Carcinogenesis **27,** 989 (2006) ▪ Delphinidin and cyanidin inhibit PDGF(AB)-induced VEGF release in vascular smooth muscle cells by preventing activation of p38 MAPK and JNK: M.H. Oak, et al.; Br. J. Pharmacol. **149,** 283 (2006) ▪ Delphinidin, an anthocyanidin in pigmented fruits and vegetables, protects human HaCaT keratinocytes and mouse skin against UVB-mediated oxidative stress and apoptosis: F. Afaq, et al.; J. Invest. Dermatol. **127,** 222 (2007)

Demecolcine see Colcemid

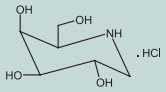
4-Demethoxydaunorubicin see Idarubicin . HCl

14-Demethylberinamycin see Geninthiocin

5-Demethylleptomycin A see Anguinomycin A

25-Deoxyecdysterone see Ponasterone A

CAS: 108147-54-2



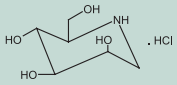
Deoxygalactonojirimycin . HCl

Deoxygalactonojirimycin . HCl [Galactostatin]

ALX-580-001-M001 1 mg
ALX-580-001-M005 5 mg

Synthetic. Potent and selective α-D-galactosidase inhibitor. Small molecule chemical chaperone.

CAS: 84444-90-6



1-Deoxymannojirimycin . HCl

25-Deoxy-20-hydroxyecdysone see Ponasterone A

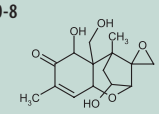
Deoxykanamycin B see Tobramycin

1-Deoxymannojirimycin . HCl

ALX-580-002-M001 1 mg
ALX-580-002-M005 5 mg

Synthetic. Potent inhibitor of α-mannosidase I. Blocks the biosynthesis of complex-type oligosaccharides. Does not inhibit the biosynthesis of lipid-linked oligosaccharides. Induces ER stress in human cells.

CAS: 51481-10-8



Deoxynivalenol

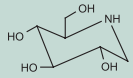
Technical Note Page 109

Deoxynivalenol [DON; Vomitoxin]

ALX-630-115-M001 1 mg
ALX-630-115-M005 5 mg

Isolated from *Trichoderma viride.* Mycotoxin found in cereals. Binds to the ribosome and inhibits protein synthesis.

CAS: 19130-96-2



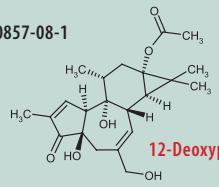
1-Deoxynojirimycin

1-Deoxynojirimycin

ALX-580-003-M001 1 mg
ALX-580-003-M005 5 mg

Isolated from *Bacillus subtilis* strain. Inhibitor of mammalian glucosidases I and II.

CAS: 60857-08-1



12-Deoxyphorbol 13-acetate

12-Deoxyphorbol 13-acetate [Prostratin; 13-Acetyl-12-deoxyphorbol]

Bulk

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

Protein kinase C (PKC) activator that does not induce tumor formation. Upregulates latent HIV-1 provirus expression and inhibts HIV infection and viral spread at the entry/fusion step of viral life cycle.

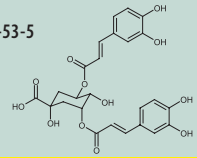
12-Deoxyphorbol 13-phenylacetate

ALX-445-049-M005 5 mg

Metabolite of 12-deoxyphorbol 13-phenylacetate 20-acetate. Potent activator of protein kinase C (PKC). Induces the expression of HIV-1 in latently infected T cells.

Diallyl thiosulfinate see Allicin

CAS: 2450-53-5



3,5-Di-O-caffeoylquinic acid

Technical Note Page 103

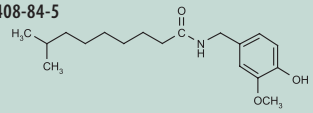
3,5-Di-O-caffeoylquinic acid [3,5-CQA; Isochlorogenic acid]

ALX-350-320-M001 1 mg
ALX-350-320-M005 5 mg

Isolated from *Cynara scolymus.* Antioxidant. Shows antiproliferative activity.

6-N-[2-(Diethylamino)ethyl]rebeccamycin see Becatecarin

CAS: 19408-84-5



Dihydrocapsaicin

Technical Note Page 104

Dihydrocapsaicin [8-Methyl-N-vanillylnonanamide]

ALX-350-052-M010 10 mg
ALX-350-052-M050 50 mg

Isolated from *Capsicum* fruit. Dihydro-analog and congener of capsaicin (Prod. No. ALX-550-066) in chili peppers (Capsicum). Like capsaicin it is an irritant. Dihydrocapsaicin accounts for about 22% of the total capsaicinoids mixture and has about the same pungency as capsaicin. Antioxidant. Reduces oxidation of serum lipids. Mutagenic.

Dihydrocytochalasin B see **Cytochalasin B, Dihydro-**

Dihydromyristicin see **Myristicin, Dihydro-**

Dihydroquercetin see **Taxifolin**

1α,25-Dihydroxycholecalciferol see **Calcitriol**

Dihydroxycoumarin 6-glucoside see **Esculin**

5,7-Dihydroxyflavone see **Chrysin**

4′,7-Dihydroxyisoflavone see **Daidzein**

5,7-Dihydroxy-8-methoxyflavone see **Wogonin**

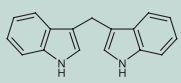
1α,25-Dihydroxyvitamin D3 see **Calcitriol**

3,3′-Diindolylmethane [DIM]

ALX-350-370-M100 100 mg
ALX-350-370-M500 500 mg

Dimer of indole-3-carbinol (Prod. No. ALX-350-347). Anticancer and antineoplastic agent. Induces apoptosis in human cancer cells. Activator of cytochrome P 450. Partial agonist of aryl hydrocarbon receptor (AhR).

CAS: 1968-05-4



3,3′-Diindolylmethane

17-[2-(Dimethylamino)ethyl]amino-17-desmethoxygeldanamycin see **17-DMAG**

1,3-Dimethylxanthine see **Theophylline**

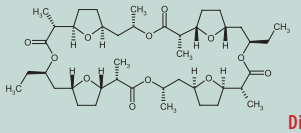
3,7-Dimethylxanthine see **Theobromine**

Dinactin [Antibiotic AKD 1C; Antibiotic S 3466A]

ALX-380-226-M001 1 mg

Antibiotic. Isolated from *Streptomyces sp.* MST-AS5448. Cation ionophore with high selectivity for ammonium and potassium. Inhibits T cell proliferation induced by IL-2 and cytokine production at nanomolar levels. Dimeric dinactin shows potent antineoplastic and antibacterial activities.

CAS: 20261-85-2



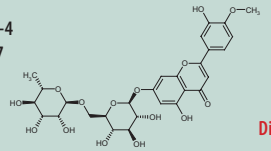
Dinactin

Diosmin [3′,5,7-Trihydroxy-4′-methoxyflavone 7-rutinoside]

ALX-385-031-G005 5 g
ALX-385-031-G025 25 g

Flavonoid glycoside. Main component in *citrus fruits*. Phlebotropic drug used to control internal symptoms of hemorrhoids and in the treatment of venous diseases. Prolongs the vasoconstrictor effect of noradrenaline on the vein wall. Reduces venous hyperpressure. Reduces capillary hyperpermeability and the expression of endothelial adhesion molecules (ICAM1, VCAM1). Effectively inhibits the P-glycoprotein (Pgp)-mediated efflux in cells. Anti-inflammatory. Inhibits lipopolysaccharide (LPS)-induced endothelial cytotoxicity.

CAS: 520-27-4
MI: **14:** 3297



Diosmin

Technical Note Page 105

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

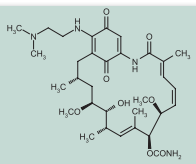
Bulk

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

Semisynthetic from geldanamycin (Prod. No. ALX-380-054). Less toxic, more potent synthetic derivative of geldanamycin. Inhibitor of angiogenesis. Inhibitor of the heat-shock protein HSP90. Inducer of apoptosis with higher antitumor activity than 17-AAG (Prod. No. ALX-380-091).

LIT: 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) ▪ Crystal structure and molecular modeling of 17-DMAG in complex with human Hsp90: J.M. Jez, et al.; Chem. Biol. **10,** 361 (2003) ▪ Antiangiogenic properties of 17-(dimethylaminoethylamino)-17-demethoxygeldanamycin: an orally bioavailable heat shock protein 90 modulator: G. Kaur, et al.; Clin. Cancer Res. **10,** 4813 (2004) ▪ Synthesis and biological activities of novel 17-aminogeldanamycin derivatives: Z.Q. Tian, et al.; Bioorg. Med. Chem. **12,** 5317 (2004) ▪ Comparison of 17-dimethylaminoethylamino-17-demethoxy-geldanamycin (17DMAG) and 17-allylamino-17-demethoxygeldanamycin (17AAG) in vitro: effects on Hsp90 and client proteins in melanoma models: V. Smith, et al.; Cancer Chemother. Pharmacol. **56,** 126 (2005)

CAS: 150270-08-9



17-DMAG

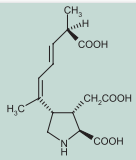
Technical Note Page 98

Domoic acid

ALX-550-152-M001 1 mg

Isolated from *Nitzschia pungens f. multiseries.* Glutamate/kainate excitatory amino acid agonist with highest affinity for the kainate receptor of all known kainic acid analogs.

CAS: 14277-97-5
MI: **14:** 3417



Domoic acid

Technical Note Page 90

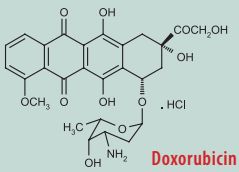
Doxorubicin . HCl [DXR; 14-Hydroxydaunomycin; Adriamycin]

Bulk

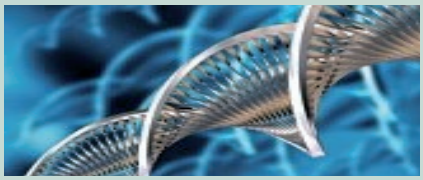
ALX-380-042-M005 5 mg
ALX-380-042-M010 10 mg
ALX-380-042-M025 25 mg

Isolated from *Streptomyces peucetius var. caesius.* Antitumor antibiotic. Induces DNA damage by intercalating into DNA and inhibiting topoisomerase II. Binds covalently to DNA. Inhibits reverse transcriptase, RNA polymerase and the catalytic activity of Dnmt1. Immunosuppressive. Antineoplastic. Induces apoptosis.

CAS: 25316-40-9
MI: **14:** 3439



Doxorubicin . HCl

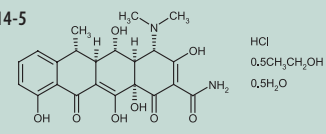


Doxycycline . hyclate [Doxycycline]

ALX-380-273-G001 1 g
ALX-380-273-G005 5 g

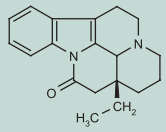
Semisynthetic from oxytetracycline. Broad spectrum antibiotic and bacteriostatic. Shows antiprotozoal properties. Potent inhibitor of MMPs (matrix metalloproteinases) *in vivo*. Inhibits collagen synthesis.

CAS: 24390-14-5
MI: **14:** 3440



Doxycycline . hyclate

CAS: 4880-88-0
MI: **14:** 3487



(-)-Eburnamonine

(-)-Eburnamonine [Vincamone]

ALX-350-216-M100 100 mg

Cerebral metabolic stimulant; shows antihypoxic effects. Vasodilator.

Ecdysone [α-Ecdysone]

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

Ecdysteroid first described as moulting hormone in insects. ***Technical Note Page 87.***

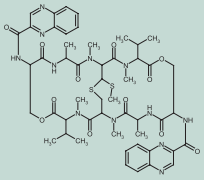
Ecdysone, 25-Deoxy-20-hydroxy- see Ponasterone A

Ecdysone, 20-Hydroxy- see 20-Hydroxyecdysone

β-Ecdysone see 20-Hydroxyecdysone

Ecdysterone see 20-Hydroxyecdysone

CAS: 512-64-1
MI: **14:** 3497



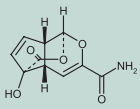
Echinomycin

Echinomycin [Quinomycin A]

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

Antibiotic. Isolated from *Streptomyces sp.* MST-AS5446. 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.

CAS: 79127-35-8



Echinosporin

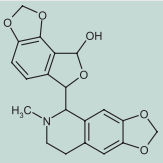
Echinosporin [NSC 357683; XK-213]

ALX-380-115-M001 1 mg
ALX-380-115-M005 5 mg

Antibiotic. Isolated from *Streptomyces sp.* Antitumor and antibacterial compound. Inhibits cell cycle at the G(2)/M phase and induces apoptosis.

EGCG see (-)-Epigallocatechin gallate

CAS: 6883-44-9



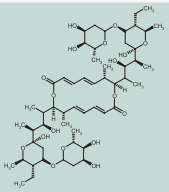
(+)-Egenine

(+)-Egenine

ALX-350-362-M025 25 mg
ALX-350-362-M100 100 mg

Isolated from *Fumaria vaillantii* or *Corydalis decumbens*. First phthalideisoquinoline hemiacetal from a natural source. Inhibits Ca^{2+} currents and contractile responses *in vitro*.

CAS: 37318-06-2



Elaiophylin

Elaiophylin [Antibiotic 255-E; Antibiotic 56-62; Azalomycin B]

ALX-380-212-M001 1 mg

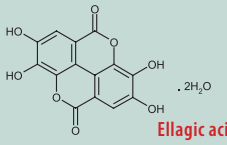
Isolated from *Streptomyces hygroscopicus* MST-AS5386. Macrolide antibiotic inhibiting testosterone 5-reductase and plasma-proton ATPase (P-ATPase). Shows antifungal, antiprotozoal, antitumor, antihelmintic and immunosuppressive activity.

Ellagic acid . $2H_2O$

ALX-270-262-M100 100 mg

Isolated from chestnut bark. Polyphenol antioxidant with antitumor properties. Inhibitor of topoisomerases. Inhibits VEGF-induced phosphorylation of VEGFR-2 and PDGF-induced phosphorylation of PDGFR. Induces apoptosis.

CAS: 476-66-4
MI: **14:** 3547



Ellagic acid . $2H_2O$

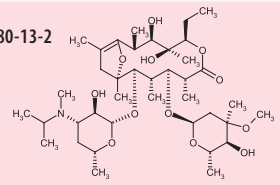
EM574 [Motilide]

ALX-380-264-M001 1 mg

Semisynthetic from erythromycin A. Agonist of the motilin receptor. Shows antimicrobial and gastrointestinal motor stimulating activity *in vivo*.

Synthesized by Organic Chemistry Group, The Kitasato Institute, Tokyo.

CAS: 110480-13-2



EM574

Emetine . 2HCl [6',7',10,11-Tetramethoxyemetan]

ALX-350-092-M050 50 mg

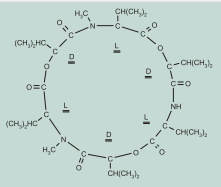
Isolated from ground roots of *Uragoga ipecacuanha*. Irreversibly blocks protein synthesis. Induces hypotension by blocking adrenoreceptors. Inhibits DNA replication in the early S phase. Inhibits HIF-1 activation by hypoxia. Induces apoptosis in leukemia cells. Antiamebic.

Emodin [6-Methyl-1,3,8-trihydroxyanthraquinone]

ALX-350-057-M025 25 mg

Isolated from *Frangula* bark. Inhibitor of p56lck tyrosine kinase. Has mutagenic and genotoxic effects, mainly in bacterial systems. Anti-cancer agent. Exhibits anti-proliferative effects in various cancer cell lines by efficient induction of apoptosis. Has inhibitory effects on angiogenic and metastasis regulatory processes. Anti-inflammatory compound. Suppresses NF-κB activation.

MI: **14:** 3585



Enniatin B

Enniatin B

ALX-380-007-M001 1 mg

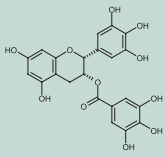
Isolated from *Fusarium orthoceras var. enniatum*. Ionophore antibiotic. Inhibitor of the *S. cerevisiae* ABC transporter Pdr5p. Inhibitor of acyl-CoA-cholesterol acyltransferase and of phosphodiesterase. Potential anti-cancer compound.

(-)-Epigallocatechin gallate [EGCG]

ALX-270-263-M010 10 mg
ALX-270-263-M050 50 mg

Isolated from green tea. Antitumor reagent. Antioxidant. Protects cells from lipid peroxidation and DNA damage induced by reactive free radicals. Inhibits inducible nitric oxide synthase (iNOS; NOS II). Chemopreventive anti-cancer agent. Induces apoptosis in human cancer cell lines. Inhibits MAP kinase mediated signalling pathways. Inhibits angiogenesis. Inhibits telomerase and DNA methyltransferase. Anti-inflammatory agent.

CAS: 989-51-5
MI: **14:** 3526



(-)-Epigallocatechin gallate

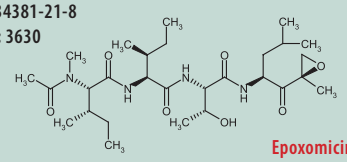
Technical Note Page 91

Epoxomicin

ALX-350-254-C050 50 µg

Synthetic. Cell permeable, potent and selective proteasome inhibitor originally isolated from *Actinomycetes* strain based on its potent *in vivo* antitumor activity. More potent inhibitor of the chymotrypsin-like activity of the proteasome than lactacystin (Prod. No. ALX-350-245). Effectively inhibits NF-κB activation *in vitro* and potently blocks inflammation *in vivo* in the mouse ear edema assay.

CAS: 134381-21-8
MI: **14:** 3630



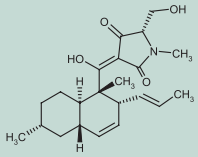
Epoxomicin

Equisetin

ALX-350-322-M001 1 mg

Isolated from *Fusarium equiseti.* Fungal metabolite with antibiotic and cytotoxic activity. Inhibitor of mitochondrial ATPases and HIV-1 integrase. Mycotoxin.

CAS: 57749-43-6



Equisetin

(R,S)-Equol [(±)-Equol; 3,4-Dihydro-3-(4-hydroxyphenyl)-2*H*-1-benzopyran-7-ol; 4′,7-Dihydroxyisoflavane]

ALX-385-032-M005 5 mg
ALX-385-032-M025 25 mg

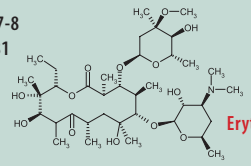
Flavonoid. Racemic mixture. Urinary metabolite of daidzein. Inhibits 12-O-tetradecanoylphorbol 13-acetate (TPA)-induced neoplastic cell transformation by targeting the MEK/ERK/p90RSK/activator protein-1 signalling pathway. Shows positive effects on the incidence of prostate cancer and physiological changes after menopause. Functions as a DHT blocker. Preferentially activates estrogen receptor β (ERβ).

Erythromycin

ALX-380-274-G005 5 g

Antibiotic. Isolated from *Streptomyces erythreus.* Inhibits protein synthesis (elongation) at the transpeptidation step. Binds to the 23S RNA of the 50S ribosomal subunit. Effective against Gram-negative and Gram-positive bacteria.

CAS: 114-07-8
MI: **14:** 3681



Erythromycin

Esculin . H_2O [6,7-Dihydroxycoumarin 6-glucoside]

ALX-350-021-G005 5 g

Antioxidant used as a skin protectant. Shows vitamin P activity. Protects cells against DNA damage. Reduces ROS levels. Inhibits carcinogenesis.

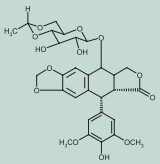
Etofylline see Theophylline, 7-(β-Hydroxyethyl)-

Etoposide [VP-16-213]

ALX-270-209-M025 25 mg
ALX-270-209-M100 100 mg
ALX-270-209-M500 500 mg

Semisynthetic derivative of podophyllotoxin. Antitumor reagent. Topoisomerase II inhibitor. Induces apoptosis by FasL. Activates p53 resulting in upregulated expression of TRAIL-R2 (DR5) and Bak to overcome TRAIL resistance in Bax-deficient human colon carcinoma cancer cells.

CAS: 33419-42-0
MI: **14:** 3886



Etoposide

Eugenol (high purity) [2-Methoxy-4-(2-propenyl)phenol]

ALX-350-123-G001 1 g

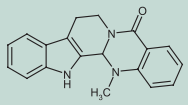
Isolated from clove oil, nutmeg, cinnamon and bay leaf. TRPV1 agonist. Analgesic. Has antifungal, antimicrobial and antioxidant properties. ***Technical Note Page 108.***

Evodiamine

ALX-350-330-M010 10 mg
ALX-350-330-M050 50 mg

Synthetic. Originally isolated from *Evodia rutaecarpa.* A cell permeable, non-pungent vanilloid receptor agonist that induces apoptosis. Inhibits nitric oxide (NO) production. Also inhibits tumor cell migration *in vitro*. Is effective against multidrug-resistant cancer cells.

CAS: 518-17-2
MI: **14:** 3908



Evodiamine

F-244 see Hymeglusin

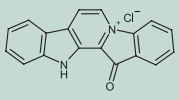
FAD see Flavin Adenine Dinucleotide

Farcinicin see Aureothricin

Fascaplysin

ALX-270-300-M001 1 mg
ALX-270-300-M005 5 mg

Synthetic. Originally isolated from a marine sponge. Selective CDK4/cyclin D1 inhibitor (in a ATP competitive manner).



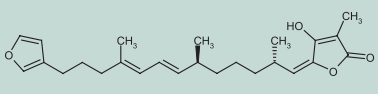
Fascaplysin

Fasciculatin

ALX-350-137-M001 1 mg

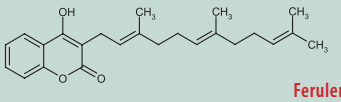
Isolated from *Ircinia fasciculata.* Secondary metabolite of marine sponges. Shows moderate cytotoxicity.

CAS: 37905-12-7

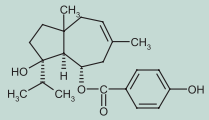


Fasciculatin

CAS: 6805-34-1

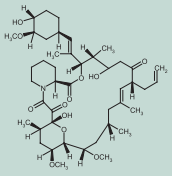


Ferulenol



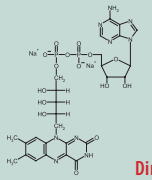
Ferutinin

CAS: 104987-11-3
MI: **14:** 9025



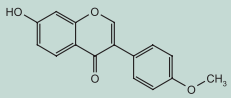
FK506

CAS: 84366-81-4
MI: **14:** 4091



Flavin Adenine Dinucleotide . 2Na

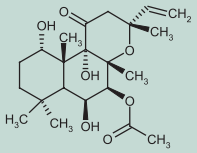
CAS: 485-72-3
MI: **14:** 4244



Formononetin

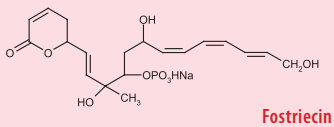
Technical Note Page 107

CAS: 66575-29-9
MI: **14:** 2476



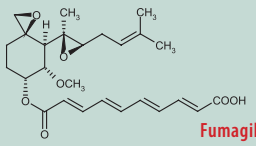
Forskolin

CAS: 87860-39-7



Fostriecin

CAS: 23110-15-8
MI: **14:** 4286



Fumagillin

Ferroxidase see **Ceruloplasmin**

Ferulenol

Bulk

ALX-350-124-M001	1 mg
ALX-350-124-M005	5 mg
ALX-350-124-M010	10 mg

Isolated from *Ferula communis*. Prenylated 4-hydroxycoumarin. Antitubercular antibiotic with potent activity against Mycobacteria. Exerts taxol-like and dose-dependent cytotoxicity against various human tumor cell lines. Stimulator of tubulin polymerisation *in vitro* and inhibitor of colchicine binding to tubulin. Antithrombotic, depressing the activity of all vitamin K-dependent coagulation factors. Shows lower acute toxicity and higher activity than warfarin. Shows hepatocyte toxicity.

Ferutinin (high purity)

[Tefestrol (high purity)]

Bulk

ALX-350-098-M001	1 mg
ALX-350-098-M005	5 mg
ALX-350-098-M010	10 mg

Semisynthetic. Potent, naturally occuring non-steroid estrogenic compound. Agonist for estrogen receptor (ER) α and agonist/antagonist for ERβ with higher binding affinity than tamoxifen (Prod. No. ALX-550-095) for both ERs. Electrogenic Ca^{2+} ionophore inducing mitochondrial depolarisation which can be completely blocked by cyclosporin A (Prod. No. ALX-380-002), suggesting that ferutinin opens the mitochondrial permeability transition pore (mPTP). In a concentration range of 1-50µM ferutinin increases the permeability of thymocytes, mitochondria, sarcoplasmic reticulum, liposomes and bilayer lipid membranes for Ca^{2+}.

Ficusin see **Psoralen**

FK506

[Tacrolimus]

Bulk

ALX-380-008-M001	1 mg
ALX-380-008-M005	5 mg
ALX-380-008-M025	25 mg

Potent immunosuppressor. Widely used after organ transplantation. Binds to FK506-binding protein-12 (FKBP12). FK506-FKBP12 complexes block protein phosphatase 2B (calcineurin; PP2B), a key enzyme in T cell activation. As a result of calcineurin inhibition, FK506 inhibits multiple biological processes including activation of T cells, interleukin-2 (IL-2) gene expression, nitric oxide synthase (NOS) activation, cell degranulation and apoptosis. In addition, FK506 shows profound neuroprotective and neuroregenerative effects.

3,3′,4′,5,7-Flavanpentol see **Catechin**

Flavin Adenine Dinucleotide . 2Na . H_2O

[FAD]

ALX-480-084-M050	50 mg

Flavine mononucleotide see **Riboflavine-5′-phosphate**

FMN see **Riboflavine-5′-phosphate**

Folic acid

[Pteroylglutamic acid]

ALX-460-006-G010	10 g

Folimycin see **Concanamycin A**

Formononetin (high purity)

[7-Hydroxy-4′-methoxyisoflavone]

ALX-270-312-M005	5 mg

Interacts with human estrogen receptors with low potency. Enhances IL-4 production in a dose-dependent manner. Inhibits lecitin peroxidation induced by hydroxyl radicals. Selective inhibitor of the γ-isoform of alcohol dehydrogenase. Antioxidant.

Forskolin

[Colforsin]

ALX-350-001-M001	1 mg	ALX-350-001-M025	25 mg
ALX-350-001-M005	5 mg	ALX-350-001-M050	50 mg
ALX-350-001-M010	10 mg		

Isolated from *Coleus forskohlii*. Activates adenylate cyclase leading to an increase in the intracellular concentration of cAMP. Widely used tool for the investigation of the role of cAMP as a second messenger with a broad range of potential therapeutic applications. Inotropic agent and vasodilator. Induces platelet aggregation. Inhibits ion channels by a mechanism that does not involve cAMP. Non-competitive inhibitor of nicotinic acetylcholine receptors.

Fostriecin

[Phosphotrienin; CI-920]

ALX-380-065-C010	10 µg

Isolated from *Streptomyces pulveraceous subsp. fostreus*. Antitumor antibiotic. Catalytic inhibitor of topoisomerase II. Strong protein phosphatase 2A (PP2A) inhibitor. Weak inhibitor for PP1. No apparent effect on PP2B. The binding site for fostriecin on PP2A is different from that of okadaic acid (see Prod. No. ALX-350-003).

Fumagillin

[Fumidil B; Fumadil B]

ALX-350-119-MC05	0.5 mg
ALX-350-119-M001	1 mg

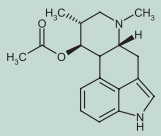
Isolated from *Aspergillus fumigatus*. Inhibitor of angiogenesis and endothelial cell proliferation. Specific inhibitor of methionine aminopeptidase type II (MetAP-II). Antineoplastic. Anti-infective.

Fumigaclavine A

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

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

CAS: 6879-59-0



Fumigaclavine A

Technical Note Page 110

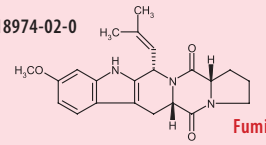
Fumitremorgin C

[FTC; SM-Q] Bulk

ALX-350-127-C250 250 µg

Isolated from *Aspergillus fumigatus.* Mycotoxin. 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.*

CAS: 118974-02-0



Fumitremorgin C

Technical Note Page 110

Fumonisin B_1

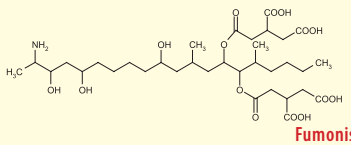
ALX-350-017-M001 1 mg
ALX-350-017-M005 5 mg

Isolated from *Fusarium moniliforme.* Mycotoxin. Induces DNA damage in the liver and cancer. Inhibitor of sphingosine biosynthesis and apoptosis. Activates Akt (protein kinase B; PKB), which leads to increased survival, inhibition of GSK-3β activity and post-translational stabilization of cyclin D1.

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). Found as contaminant mostly in corn silage; was detected recently for the first time in the industrially important *Aspergillus niger.* Induces cancer. Inducer of apoptosis.



Fumonisin B_1

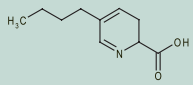
Technical Note Page 110

Fusaric acid

ALX-380-052-M050 50 mg

Antibiotic. Isolated from *Gibberella fujikuroi.* Inhibitor of dopamine β-hydroxylase.

CAS: 536-69-6
MI: **14:** 4314



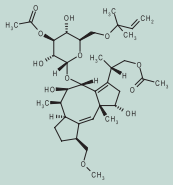
Fusaric acid

Fusicoccin

ALX-350-115-MC05 0.5 mg
ALX-350-115-M001 1 mg

Phytotoxin. Isolated from fungus *Fusicoccum amygdali.* Diterpene glucoside with numerous effects on plants. Induces H^+ extrusion from plant cells by 14-3-3-dependent activation of the plasma membrane H^+-ATPase. Stimulates cell enlargement, ion uptake, seed germination, opening the stomata, etc. Markedly reduces the cell's capability for H_2O_2 scavenging.

CAS: 20108-30-9



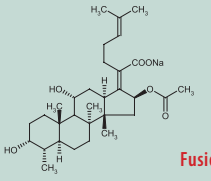
Fusicoccin

Fusidic acid . Na

ALX-380-011-M050 50 mg

Antibiotic which suppresses nitric oxide (NO) toxicity in pancreatic islet cells. Inhibits protein synthesis by inhibition of elongation factor G at the level of the ribosome.

CAS: 751-94-0
MI: **14:** 4317



Fusidic acid . Na

G418 . sulfate

[Geneticin] Bulk

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

Galactostatin see Deoxygalactonojirimycin

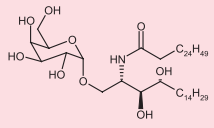
α-Galactosylceramide

[α-Gal-Cer] Bulk

ALX-306-027-C250 250 µg
ALX-306-027-M001 1 mg

Potent stimulator of natural killer T (NKT) cells. Originally isolated from the marine sponge *Agelas mauritianus.*

LIT: Syntheses of alpha-, beta-monoglycosylceramides and four diasteromers of an alpha-galactosylceramide: M. Morita, et al.; Bioorg. Med. Chem. Lett. **5,** 699 (1995) ▪ Structure-activity relationship of alpha-galactosylceramides against B16-bearing mice: M. Morita, et al.; J. Med. Chem. **38,** 2176 (1995) ▪ Structure-activity relationship and conformational analysis of monoglycosylceramides on the syngeneic mixed leukocyte reaction: H. Iijima, et al.; Bioorg. Med. Chem. **6,** 1905 (1998) ▪ Effects of 3alpha- and 3beta-galactosylated alpha-galactosylceramides on the immune system: T. Sakai, et al.; Bioorg. Med. Chem. Lett. **9,** 697 (1999) ▪ Modulation of CD1d-restricted NKT cell responses by using N-acyl variants of alpha-galactosylceramides: K.O. Yu, et al.; PNAS **102,** 3383 (2005) ▪ Synthesis and biological evaluation of alpha-galactosylceramide (KRN7000) and isoglobotrihexosylceramide (iGb3): C. Xia, et al.; Bioorg. Med. Chem. Lett. **16,** 2195 (2006)



α-Galactosylceramide

Galanthamine . HBr

[Galantamine; Nivalin]

ALX-550-336-M050 50 mg

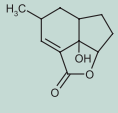
Specific, competitive and reversible acetylcholinesterase inhibitor. Alzheimer's disease therapeutic.

Galiellalactone

ALX-350-336-MC05 0.5 mg

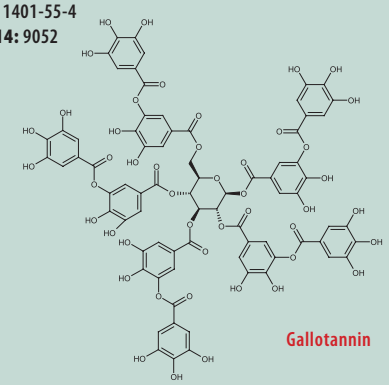
Isolated from an unidentified fungus, MST-FP1889. Originally isolated from *Galiella rufa* as a plant growth regulator. Inhibits IL-6 mediated signal transduction by blocking the binding of the activated STAT3 dimers to their DNA binding sites without inhibiting the tyrosine and serine phosphorylation site of the STAT3 transcription factor.

CAS: 133613-71-5



Galiellalactone

CAS: 1401-55-4
MI: **14:** 9052



Gallotannin

Gallidermin [6L-Epidermin]

ALX-380-072-M005 5 mg

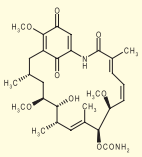
Isolated from *Staphylococcus gallinarum* Tü3928. Interferes with bacterial cell wall biosynthesis.

Gallotannin [Tannic acid]

ALX-270-418-G001 1 g

Occurs in the bark and fruit of many plants, notably in the bark of the oak species, in sumac and myrobalan. Inhibitor of poly(ADP-ribose) glycohydrolase (PARG). Cytoprotective in oxidatively stressed cells. Inhibitor of endothelial nitric oxide synthase (eNOS; NOS III) and weak inhibitor of iNOS (NOS II) and nNOS (NOS I). Induces cyclooxygenase-2 (COX-2) expression. Free radical scavenger.

CAS: 30562-34-6



Geldanamycin

Technical Note Page 98

Geldanamycin

Bulk

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

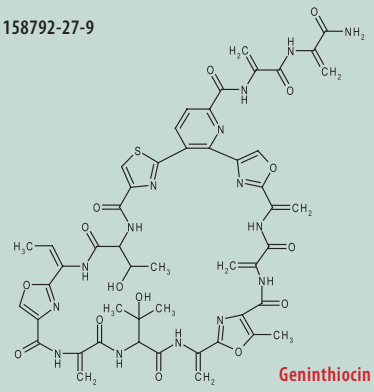
Isolated from *Streptomyces hygroscopicus*. Potent antitumor antibiotic. Inhibitor of pp60src tyrosine kinase and of c-myc gene expression in murine lymphoblastoma cells. Inhibits the transforming activity of abl, erbB, fps, src, and yes. Binds specifically to HSP90 and to its endoplasmic reticulum homolog GP96 (GRP94). Capable of destabilizing several oncogene and proto-oncogene products. Potent inhibitor of the nuclear hormone receptor family. Protects against α-synuclein toxicity to dopaminergic neurons in Drosophila. Destabilizes mutant p53 protein from a number of breast, leukemic, and prostate cell lines. Inhibits basal and hypoxia-induced expression of c-Jun and abolishes hypoxia-induced increase in c-Jun N-terminal kinase (JNK) activity. Inhibits telomerase activity through inhibition of HSP90, a chaperone required for the assembly and activation of telomerase in human cells. ~10-fold more potent than herbimycin A (Prod. No. ALX-350-029).

Geldanamycin, 17-(Allylamino)-17-desmethoxy- see 17-AAG

Geldanamycin, 17-[2-(Dimethylamino)ethyl]amino-17-desmethoxy- see 17-DMAG

Geliomycin see Resistomycin

CAS: 158792-27-9



Geninthiocin

Gelonin

ALX-350-150-M001 1 mg

Isolated from *Gelonium multiflorum*. Type I ribosome inactivating protein (RIP). Depurinates RNA in ribosomes, thus inhibiting protein synthesis in eukaryotic cells, which results in cell death. Widely used to construct immunotoxins composed of cell-targeted antibodies. As a type I RIP it lacks the lectin subunit and is practically non-toxic to intact cells. Inhibits cell-free protein synthesis in reticulocyte assay with globin messenger (IC_{50}=2.7ng/ml).

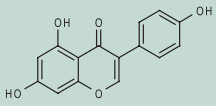
Geneticin see G418 . sulfate

Geninthiocin [14-Demethylberinamycin]

ALX-380-227-MC05 0.5 mg

Antibiotic. Isolated from *Streptomyces sp.* MST-AS5991. Potent activator of the tipA gene, a bacterial transcription regulator involved in multidrug resistance.

CAS: 446-72-0
MI: **14:** 4391



Genistein

Technical Note Page 107

Genistein (synthetic) [4',5,7-Trihydroxyisoflavone]

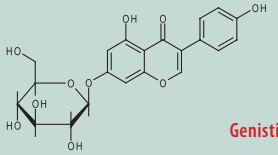
Bulk

ALX-350-006-M010 10 mg
ALX-350-006-M025 25 mg
ALX-350-006-M050 50 mg
ALX-350-006-M100 100 mg
ALX-350-006-G001 1 g

Synthetic. Tyrosine protein kinase inhibitor. Inhibits phosphorylation of EGFR kinase. Inhibits tumor cell proliferation and induces tumor cell differentiation. Inhibits topoisomerase II activity *in vivo*. Produces cell cycle arrest and apoptosis. Direct inhibitor of insulin-induced glucose uptake in adipocytes.

Genistein, Amino- see 4'-Amino-6-hydroxyflavone

CAS: 529-59-9
MI: **14:** 4391



Genistin

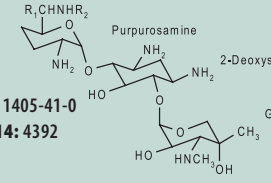
Technical Note Page 107

Genistin [Genistein-7-O-glucoside]

ALX-350-247-M010 10 mg

Glucoside of genistein (Prod. No. ALX-350-006) found in soy beans. Useful as a negative control for genistein and other tyrosine kinase inhibitors. Selective inhibitor of terminal deoxyribonucleotidyltransferase (TdT). Displays antioxidant and anticarcinogenic properties.

CAS: 1405-41-0
MI: **14:** 4392



Gentamicin sulfate

Gentamicin sulfate

ALX-380-003-G001 1 g
ALX-380-003-G005 5 g
ALX-380-003-G010 10 g
ALX-380-003-G025 25 g

Isolated from *Micromonospora sp.* Broad-spectrum cell culture antibiotic that is nontoxic to viruses and mammalian cells at antibacterial and antimycoplasmal concentrations. Due to its extended stability and slow development of bacterial resistance, it is a useful antibiotic in long-term virus und tissue culture studies.

7-Geromyloxycoumarin see Auraptene

Gilvocarcin M

[Anandimycin B; Toromycin B; Antibiotic 1072A]

ALX-380-228-MC05 0.5 mg

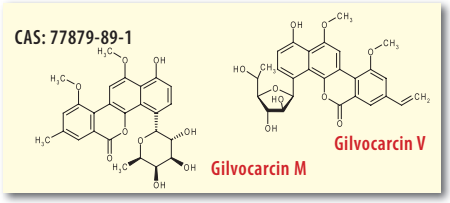
Antibiotic. Isolated from *Streptomyces sp.* MST-AS5353. Has antibacterial, antifungal, antiviral and antitumor activities. Interacts with DNA. Less active than gilvocarcin V (Prod. No. ALX-380-113).

Gilvocarcin V

[Anandimycin A; Toromycin; Antibiotic 1072B]

ALX-380-113-C250 250 µg
ALX-380-113-M001 1 mg

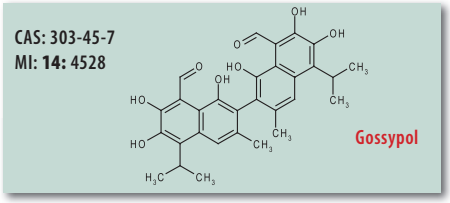
Antibiotic. Isolated from *Streptomyces sp.* Antibacterial and cytotoxic against Gram-positive bacteria. Mediates a unique cross-linking reaction between DNA and histidine H3. Weakly active against Gram-negative bacteria, fungi and tumors. Antineoplastic and photosensitizing compound.



Gliotoxin

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. Inhibits the activation of transcription factor NF-κB. Antioxidant.



Gonyautoxin 2/3 Epimers

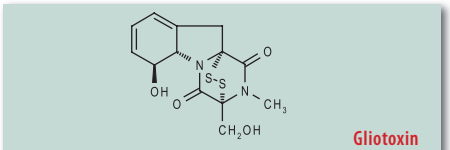
ALX-350-307-C010 10 µg

Neurotoxin. Isolated from *Alexandrium tamarense.* Epimeric mixture of gonyautoxin 2 (GTX II, C-11α-hydroxysaxitoxinsulfate) and gonyautoxin 3 (GTX III, C-11β-hydroxysaxitoxinsulfate). Equally potent and selective Na^+ channel blockers. ***Technical Note Page 90.***

Gossypol

ALX-350-113-M100 100 mg

Isolated from *Gossypium genus, Malvaceae.* Is a mixture of ~ 65%-(+) and ~35%-(-) enantiomers. Male antifertility agent. Shows antitumor, antiviral and antioxidant actions. Small molecule inhibitor of Bcl-2/Bcl_{XL}. Induces apoptosis. Synergizes with radiation and chemotherapy *in vitro.* Reversible inhibitor of protein phosphatase 2B (calcineurin; PP2B). Nonspecific protein kinase C (PKC) inhibitor.



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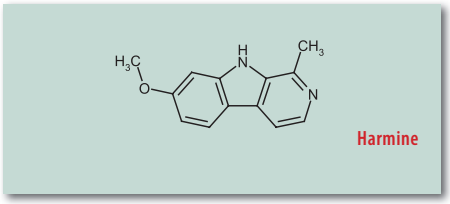
Gramicidin A (high purity)

ALX-350-233-M001 1 mg
ALX-350-233-M005 5 mg

Isolated from *Bacillus brevis.* Naturally occurring ion channel forming pentadecapeptide. Causes K^+/H^+-exchange in mitochondria in a non-voltage dependent manner.

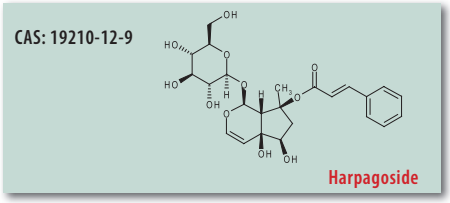


Harmine

[Banisterine; Leucoharmine; Telepathine; Yageine]

ALX-350-371-M250 250 mg

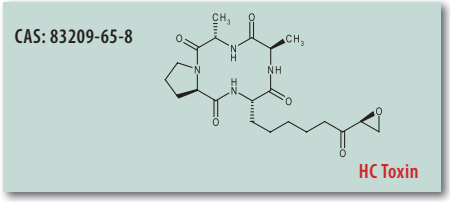
Originally isolated from *Peganum harmala.* Alkaloid of the β-carboline family. Regulates PPARγ expression. Inhibits the Wnt signalling pathway in a cell-specific manner. Down-regulates inflammatory gene expression (TNF-α, IL-1β, iNOS). Reversibly inhibits monoamine oxidase inhibitor A (MAO-A), but has no effect on MAO-B.



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 inducible nitric oxide synthase (iNOS; NOS II) and cyclooxygenase-2 (COX-2) expression through inhibition of NF-κB activation.



HC Toxin

ALX-630-102-M001 1 mg

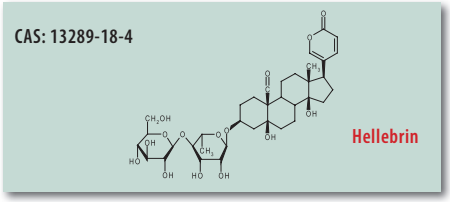
Isolated from *Helminthosporium carbonium.* Potent, cell permeable, non-competitive and reversible inhibitor of histone deacetylase (HDAC). Does not inhibit histone acetyltransferases. Induces expression of γ-globulin in erythroid cells. Shows anti-mitogenic activities. Induces cell cycle arrest and apoptosis in tumor cells.

Heliomycin see Resistomycin

Hellebrin

ALX-350-105-M001 1 mg
ALX-350-105-M005 5 mg

Isolated from *Helleborus sp*. Cardiotonic glycoside which presents a bufadienolide-steroid structure. Besides ouabain (Prod. No. ALX-350-066), from the class of cardenolides hellebrin is the second unique water soluble cardiotonic glycoside. Extremely potent inhibitor of Na^+/K^+-ATPase (sodium pump) blocking the active efflux of Na^+ and reuptake of K^+ of this membrane enzyme. Shows a positive ionotropic effect by increasing the intra-cellular Ca^{2+} concentration. Strong immunosuppressor inhibiting T cell activity with much higher potency than cortisol or cyclosporin A (Prod. No. ALX-380-002). Induces caspase-dependent apoptosis.



Hepatotox Set™ 1

ALX-850-325-KI01 1 Set

Set contains:

Microcystin-LA (25 µg)	Microcystin-LY (25 µg)
Microcystin-LF (25 µg)	Microcystin-RR (50 µg)
Microcystin-LR (50 µg)	Microcystin-YR (25 µg)
Microcystin-LW (25 µg)	Nodularin (50 µg)

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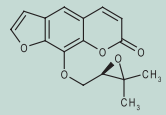


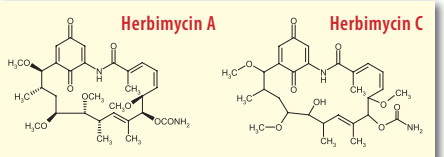
Heraclenin

Heraclenin

ALX-350-303-M002 2 mg

The furanocoumarins heraclenin (Prod. No. ALX-350-303) and imperatorin (Prod. No. ALX-350-302) inhibit T cell-receptor-mediated proliferation in human primary T cells in a concentration-dependent manner. Both compounds also induce apoptosis. While imperatorin induces DNA fragmentation at the G1/S phase of the cell cycle, heraclenin induces DNA fragmentation at the G2/M phases of the cell cycle, thus despite a close structural similarity they induce apoptosis in mechanistically different ways.

LIT: Coumarins from Opopanax chironium. New dihydrofuranocoumarins and differential induction of apoptosis by imperatorin and heraclenin: G. Appendino, et al.; J. Nat. Prod. **67,** 532 (2004) ▪ Imperatorin inhibits HIV-1 replication through an Sp1-dependent pathway: R. Sancho, et al.; J. Biol. Chem. **279,** 37349 (2004) ▪ Imperatorin inhibits T-cell proliferation by targeting the transcription factor NFAT: N. Marquez, et al.; Planta Med. **70,** 1016 (2004)



Herbimycin A Herbimycin C

Technical Note Page 98

Herbimycin A

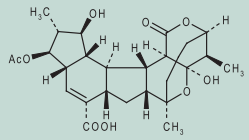
ALX-350-029-C100 100 µg
ALX-350-029-M001 1 mg

Antibiotic. Isolated from *Streptomyces sp.* Cell permeable tyrosine kinase inhibitor. Inhibitor of HSP90, NF-κB activation and angiogenesis. Increases the sensitivity of certain cancer cells to chemotherapeutic agents. Blocks mitotic activity.

Herbimycin C [Antibiotic TAN 420D]

ALX-350-349-MC05 0.5 mg

Antibiotic. Isolated from *Streptomyces sp.* MST-AS5386. Minor analog of the herbimycin complex with potent antitumor activity.



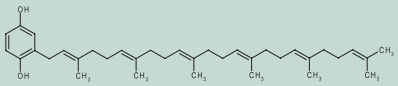
Hexacyclinic acid

(±)-Hesperetin [(±)-3′,5,7-Trihydroxy-4′-methoxyflavanone]

ALX-385-011-G001 1 g

Antioxidant flavonoid. Induces G1-phase cell cycle arrest. Anti-inflammatory. Suppresses NF-κB activation. Reduces cholesterol biosynthesis. Inhibits lipid peroxidation. Neuroprotective against neuronal oxidative damage. ***Technical Note Page 105.***

CAS: 119980-00-6



Hexaprenylhydroquinone

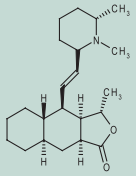
Hexacyclinic acid

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)

CAS: 6879-74-9



(+)-Himbacine

3,3′,4′,5,5′,7-Hexahydroxyflavone see Myricetin

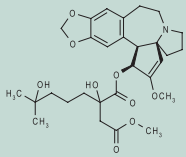
3′,4′,5,6,7,8-Hexamethoxyflavone see Nobiletin

Hexaprenylhydroquinone [HPH]

ALX-350-138-M001 1 mg

Isolated from *Sarcotragus sp.* Potent inhibitor of HIV reverse transcriptase and cellular DNA polymerase. Inhibitor of CDC25A. Similar compounds have shown inhibitory effects on phospholipase A2 (PLA2).

CAS: 26833-87-4



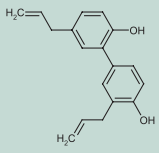
Homoharringtonine

(+)-Himbacine

ALX-550-061-M001 1 mg
ALX-550-061-M005 5 mg
ALX-550-061-M025 25 mg

Isolated from the Australian pine *Galbulimima baccata.* Potent muscarinic antagonist that displays selectivity for the M2 or M4 receptors.

CAS: 35354-74-6
MI: **14:** 4742



Honokiol

Homoharringtonine

ALX-350-236-M001 1 mg
ALX-350-236-M005 5 mg

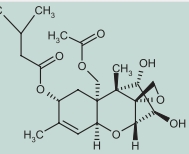
Isolated from *Cephalotaxus hainanensis.* Cephalotaxine alkaloid. Inhibits the formation of diphenylalanine and acetylphenylalanyl-puromycin in liver ribosomes. Has promising activity in hematologic malignancies. Lowers the levels of telomerase. Induces apoptosis.

Honokiol [5,3′-Diallyl-2,4′-biphenyldiol] Bulk

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

Isolated from *Magnolia officinalis.* Potent and highly tolerable antitumor and antiangiogenic compound. Anxiolytic, anti-thrombotic and antibacterial. Inhibitor of nitric oxide (NO) and TNF-α production in LPS-activated macrophages by the suppression of inducible nitric oxide synthase (iNOS; NOS II) expression. Isomeric with magnolol (Prod. No. ALX-350-352).

CAS: 26934-87-2



HT-2 Toxin

Technical Note Page 110

HT-2 Toxin

ALX-630-113-M001 1 mg
ALX-630-113-M005 5 mg

Semisynthetic, derived from T2 toxin from *Fusarium tricinctum.* Trichothecene group mycotoxin. Induces apoptosis.

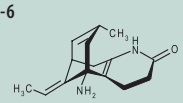
(-)-Huperzine A

[(-)-Selagine]

ALX-550-065-MC05 0.5 mg
ALX-550-065-M001 1 mg

Isolated from *Lycopodium sp.* Plant alkaloid. Active isomer with acetylcholine esterase activity. Protects cells against hydrogen peroxide, β-amyloid protein, glutamate, ischemia and staurosporine-induced cytotoxicity and apoptosis. Prospective agent for the treatment of Alzheimer's disease.

CAS: 102518-79-6
MI: **14:** 4755



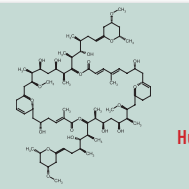
(-)-Huperzine A

Hurghadolide A

ALX-350-357-C010 10 µg

Isolated from marine sponge *Theonella swinhoei.* Cytotoxic. Disrupts the actin cytoskeleton. Antifungal.

LIT: Hurghadolide A and swinholide I, potent actin-microfilament disrupters from the Red Sea sponge Theonella swinhoei: D.T. Youssef & S.L. Mooberry; J. Nat. Prod. **69,** 154 (2006)



Hurghadolide A

1-Hydroxycholecalciferol see Alfacalcidol

14-Hydroxydaunomycin see Doxorubin

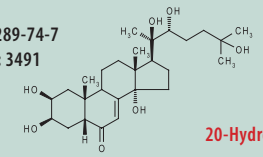
20-Hydroxyecdysone

[β-Ecdysone; Ecdysterone]

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

Most widely occurring ecdysteroid in both plant and animal species. Controls cell death during metamorphosis of *Drosophila melanogaster.*

CAS: 5289-74-7
MI: **14:** 3491



20-Hydroxyecdysone

Technical Note Page 87

7-(β-Hydroxyethyl)theophylline see Theophylline, 7-(β-Hydroxyethyl)-

Hydroxyleptomycin B see Kazusamycin A

7-Hydroxy-4'-methoxyisoflavone see Formononetin

21-Hydroxyoligomycin A

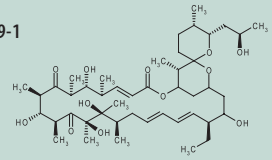
[Nemadectin ω; Antibiotic LL-F28249 ω]

ALX-380-224-M001 1 mg

Isolated from *Streptomyces sp.* AS5351. Co-metabolite of nemadectin. Antitumor agent with weak antifungal and nematocidal activity.

LIT: Plasmid effects on secondary metabolite production by a streptomycete synthesizing an anthelmintic macrolide: D.I. Thomas, et al.; J. Gen. Microbiol. **137,** 2331 (1991) ▪ Structure and absolute stereochemistry of 21-hydroxyoligomycin A: M.M. Wagenaar, et al.; J. Nat. Prod. **70,** 367 (2007)

CAS: 102042-09-1



21-Hydroxyoligomycin A

7-Hydroxystaurosporine see UCN-01

Hydroxyvitamin D3 see Alfacalcidol

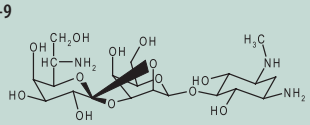
Hygromycin B (liquid)

Bulk

ALX-380-059-UM01 1 MU

Isolated from *Streptomyces hygroscopicus.* Sterile and ready-to-use antibiotic with high activity. Inhibits growth of prokaryotic and eukaryotic microorganisms and mammalian cells. Inhibits protein synthesis at the translocation step on the 70S ribosome and causes misreading of the mRNA. Penetrates cells that have been permeabilized by virus infection, hence it can act as an effective antiviral agent.

CAS: 31282-04-9
MI: **14:** 4852



Hygromycin B

Hymeglusin

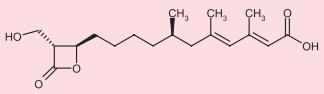
[1233A; F-244]

ALX-380-265-M001 1 mg
ALX-380-265-MM25 2.5 mg

Isolated from fungal strain *Scopulariopsis sp.* F-244. Specific and irreversible inhibitor of HMG-CoA synthase *in vitro* and *in vivo*. Inhibits mevalonate biosynthesis. Shows antimicrobial and antifungal activity.

Fungal strain courtesy of The Kitasato Institute, Tokyo.

CAS: 9027-44-5



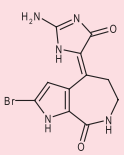
Hymeglusin

10Z-Hymenialdisine

ALX-350-289-C500 500 µg

Isolated from sponge *Axinella damicornis (Stylissa damicornis).* Originally isolated from the sponges *Axinella verrucosa* and *Acantella aurantiaca*. Potent inhibitor of mitogen-activated protein kinase kinase-1 (MEK-1). Blocks the *in vivo* phosphorylation of the microtubule-binding protein tau at sites that are hyperphosphorylated by glycogen synthase kinase-β (GSK-3β) and CDK5/p35 in Alzheimer's disease. Inhibitor of DNA damage checkpoint at G2 phase, cyclin-dependent kinases CDK1/cyclin B, CDK2/cyclin A, CDK2/cyclin E, CDK4/cyclin D1, CDK5/p25, GSK-3β, and casein kinase 1 (CK1). Inhibitor of NF-κB activation and of various pro-inflammatory cytokines such as IL-1, IL-2, IL-6, IL-8, TNF-α and nitric oxide (NO) in a variety of cell lines.

CAS: 82005-12-7



10Z-Hymenialdisine

Hymenialdisine, Debromo- see Debromohymenialdisine

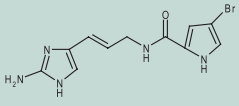
Hymenidin

[2-Debromooroidin]

ALX-350-291-M001 1 mg

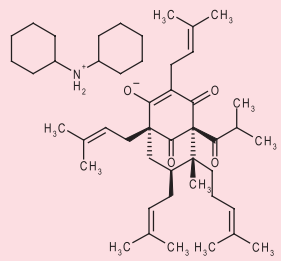
Isolated from *Hymeniacidon sp.* Antagonist of serotonergic receptors. Inhibitor of CDK5/p25 (IC_{50}=4µM) and GSK-3β (IC_{50}=12µM).

CAS: 107019-95-4



Hymenidin

CAS: 11079-53-1



Hyperforin . DCHA

Hyperforin . DCHA (high purity)

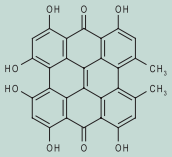
Bulk

ALX-350-097-C500 500 µg
ALX-350-097-M001 1 mg

Isolated from St. John's wort *(Hypericum perforatum)*. Major constituent of St. John's wort, a herbal remedy widely used for the treatment of depression. Inhibits the reuptake of neurotransmitters in synapses. Activator of the pregnane X receptor (PXR), which serves as a key regulator of CYP3A4 transcription, a member of the cytochrome (CYP) P450 enzyme system. Specifically activates TRPC6 channels. Represents an interesting lead-structure for a new class of antidepressants. Displays several other biological properties of potential pharmacological interest, including antibacterial, anti-inflammational, antitumoral and anti-angiogenic effects. Induces apoptosis in various cancer cells.

LIT: Hyperforin as a possible antidepressant component of hypericum extracts: S.S. Chatterjee, et al.; Life Sci. **63,** 499 (1998) ▪ Antibacterial activity of hyperforin from St John's wort, against multiresistant Staphylococcus aureus and gram-positive bacteria: C.M. Schempp, et al.; Lancet **353,** 2129 (1999) ▪ Hyperforin attenuates various ionic conductance mechanisms in the isolated hippocampal neurons of rat: S. Chatterjee, et al.; Life Sci. **65,** 2395 (1999) ▪ Hyperforin, a major antidepressant constituent of St. John's Wort, inhibits serotonin uptake by elevating free intracellular Na+1: A. Singer, et al.; J. Pharmacol. Exp. Ther. **290,** 1363 (1999) ▪ St. John's wort induces hepatic drug metabolism through activation of the pregnane X receptor: L.B. Moore, et al.; PNAS **97,** 7500 (2000) ▪ Inhibition of human cytochrome P450 enzymes by constituents of St. John's Wort, an herbal preparation used in the treatment of depression: R.S. Obach; J. Pharmacol. Exp. Ther. **294,** 88 (2000) ▪ St John's wort, a herbal antidepressant, activates the steroid X receptor: J.M. Wentworth, et al.; J. Endocrinol. **166,** R11 (2000) ▪ St John's wort (Hypericum perforatum L.): a review of its chemistry, pharmacology and clinical properties: J. Barnes, et al.; J. Pharm. Pharmacol. **53,** 583 (2001) ▪ St John's wort: Prozac from the plant kingdom: G. Di Carlo, et al.; TIPS **22,** 292 (2001) ▪ Effect of St. John's wort on free radical production: E.J. Hunt, et al.; Life Sci. **69,** 181 (2001) ▪ Hypericum perforatum (St John's Wort): a non-selective reuptake inhibitor? A review of the recent advances in its pharmacology: P.J. Nathan; J. Psychopharmacol. **15,** 47 (2001) ▪ Aristoforin, a novel stable derivative of hyperforin, is a potent anticancer agent: M. Gartner, et al.; Chembiochem **6,** 171 (2005) ▪ Hyperforin, a new lead compound against the progression of cancer and leukemia?: C. Quiney, et al.; Leukemia **20,** 1519 (2006) ▪ Hyperforin a key constituent of St. John's wort specifically activates TRPC6 channels: K. Leuner, et al.; FASEB J. **21,** 4104 (2007)

CAS: 548-04-9
MI: **14:** 4863



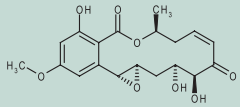
Hypericin

Hypericin (native)

ALX-350-030-M001 1 mg
ALX-350-030-M005 5 mg
ALX-350-030-M010 10 mg

Isolated from *Hypericum perforatum.* Inhibitor of protein kinase C (PKC). Shows anti-viral and anti-retroviral activity. Displays antineoplastic and antitumor activities. Inhibits casein kinase II (CKII) and MAP kinase. Bright red fluorescence emission and photostability. Antidepressant.

CAS: 76958-67-3



Hypothemycin

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.

Pyr-Phe-Thr-Asp-Val-Asp-Cys-Ser-Val-Ser-Lys-Glu-Cys-Trp-Ser-Val-Cys-Lys-Asp-Leu-Phe-Gly-Val-Asp-Arg-Gly-Lys-Cys-Met-Gly-Lys-Lys-Cys-Arg-Cys-Tyr-Gln-OH (Disulfide bonds between Cys^{7}-Cys^{28}, Cys^{13}-Cys^{33} and Cys^{17}-Cys^{35})

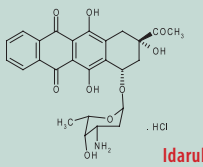
Iberiotoxin

Iberiotoxin [IbTX]

ALX-630-058-C100 100 µg

Synthetic. From *Buthus tamulus.* Potent and selective blocker of the high conductance Ca^{2+}-activated K^{+} channels.

CAS: 57852-57-0
MI: **14:** 4886



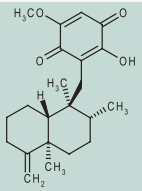
Idarubicin . HCl

Idarubicin . HCl [Idamycin; DMDR; 4-Demethoxydaunorubicin]

ALX-380-260-M001 1 mg
ALX-380-260-M005 5 mg

Synthetic. More potent, lipophilic and antineoplastic analog of daunorubicin. DNA-damaging effect includes DNA oxidation and methylation, DNA intercalation, inhibition of DNA synthesis, induction of DNA strand breaks and delay of cell cycle progression. Inhibitor of topoisomerase IIα. Produces endonucleolytic cleavage and is a marker of apoptosis.

CAS: 71678-03-0



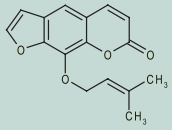
Ilimaquinone

Ilimaquinone

ALX-350-240-C100 100 µg

Displays antimicrobial, anti-HIV and anti-inflammatory properties. Induces reversible breakdown of Golgi membranes. Inhibits the association of β-COP and ADP-ribosylation factor to Golgi membranes. Interacts with methylation enzymes. Shows anticancer activity.

Immunomycin see Ascomycin



Imperatorin

Imperatorin

ALX-350-302-M002 2 mg

The furanocoumarins heraclenin (Prod. No. ALX-350-303) and imperatorin (Prod. No. ALX-350-302) inhibit T cell-receptor-mediated proliferation in human primary T cells in a concentration-dependent manner. Both compounds also induce apoptosis. While imperatorin induces DNA fragmentation at the G1/S phase of the cell cycle, heraclenin induces DNA fragmentation at the G2/M phases of the cell cycle, thus despite a close structural similarity they induce apoptosis in mechanistically different ways. Imperatorin inhibits HIV-1 replication as well as the expression of ICAM-1 in U937 foam cells. Inhibits voltage-dependent calcium channel.

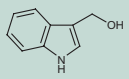
LIT: Expression of intercellular adhesion molecule-1 in U937 foam cells and inhibitory effect of imperatorin: P.Y. Yang, et al.; Acta Pharmacol. Sin. **23,** 327 (2002) ▪ Imperatorin, a furanocoumarin from Angelica dahurica (Umbelliferae), induces cytochrome c-dependent apoptosis in human promyelocytic leukaemia, HL-60 Cells: H.O. Pae, et al.; Pharmacol. Toxicol. **91,** 40 (2002) ▪ Coumarins from Opopanax chironium. New dihydrofuranocoumarins and differential induction of apoptosis by imperatorin and heraclenin: G. Appendino, et al.; J. Nat. Prod. **67,** 532 (2004) ▪ Imperatorin inhibits T-cell proliferation by targeting the transcription factor NFAT: N. Marquez, et al.; Planta Med. **70,** 1016 (2004) ▪ Imperatorin inhibits HIV-1 replication through an Sp1-dependent pathway: R. Sancho, et al.; J. Biol. Chem. **279,** 37349 (2004) ▪ Imperatorin induces vasodilatation possibly via inhibiting voltage dependent calcium channel and receptor-mediated Ca2+ influx and release: J.Y. He, et al.; Eur. J. Pharmacol. **573,** 170 (2007)

Indole-3-carbinol [I3C; Indole-3-methanol]

ALX-350-347-M250 250 mg
ALX-350-347-G001 1 g

Anticancer agent. Inhibits carcinogenesis at the initiation stage, but has been shown to enhance tumor incidence at a post-initiation stage. Inhibits the expression of cyclin-dependent kinase 6 (CDK6) and induces G1 cell cycle arrest independent of estrogen receptor signalling. Causes a dose-dependent increase in E-cadherin and BRCA1 expression.

CAS: 700-06-1



Indole-3-carbinol

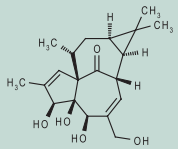
Ingenol (high purity)

Bulk

ALX-350-031-M001 1 mg
ALX-350-031-M005 5 mg

Extremely weak protein kinase C (PKC) activator. Starting material for synthesis of ingenol derivatives.

CAS: 30220-46-3



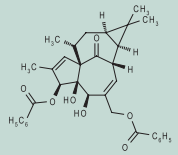
Ingenol

Ingenol 3,20-dibenzoate

ALX-350-032-M001 1 mg

Semisynthetic. Activates protein kinase C (PKC). Induces apoptosis. Anticancer agent. Shows potent antileukemic activity in the P388 mouse assay.

CAS: 59086-90-7



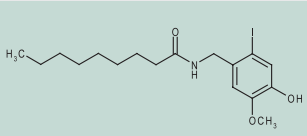
Ingenol 3,20-dibenzoate

6′-Iodononivamide [6-Iodonordihydrocapsaicin; N-(4-Hydroxy-6-iodo-3-methoxybenzyl)nonanamide]

ALX-350-122-M005 5 mg
ALX-350-122-M010 10 mg

Potent competitive TRPV1 antagonist. Convenient replacement for capsazepine (Prod. No. ALX-550-145) in most of the *in vitro* preparations currently used to assess the activity of putative vanilloid receptor agonists.

LIT: Halogenation of a capsaicin analogue leads to novel vanilloid TRPV1 receptor antagonists: G. Appendino, et al.; Br. J. Pharmacol. **139,** 1417 (2003) ▪ The taming of capsaicin. Reversal of the vanilloid activity of N-acylvanillamines by aromatic iodination: G. Appendino, et al.; J. Med. Chem. **48,** 4663 (2005)



6′-Iodononivamide

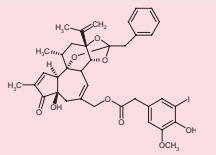
5′-Iodo-resiniferatoxin

Bulk

ALX-550-389-M001 1 mg

Binds to TRPV1 receptors expressed in HEK 293 cells and to native rat TRPV1 receptors. At least 40-fold more potent than capsazepine (Prod. No. ALX-550-145). Blocks capsaicin-induced currents in oozytes expressing TRPV1. Potently blocks pain responses elicited by capsaicin (Prod. No. ALX-550-066) *in vivo*.

LIT: Iodo-resiniferatoxin, a new potent vanilloid receptor antagonist: P. Wahl, et al.; Mol. Pharmacol. **59,** 9 (2001) ▪ Synthesis and in vitro evaluation of a novel iodinated resiniferatoxin derivative that is an agonist at the human vanilloid VR1 receptor: M.E. McDonnell, et al.; Bioorg. Med. Chem. Lett. **12,** 1189 (2002) ▪ Functional properties of the high-affinity TRPV1 (VR1) vanilloid receptor antagonist (4-hydroxy-5-iodo-3-methoxyphenylacetate ester) iodo-resiniferatoxin: G.R. Seabrook, et al.; J. Pharmacol. Exp. Ther. **303,** 1052 (2002) ▪ Neurogenic responses mediated by vanilloid receptor-1 (TRPV1) are blocked by the high affinity antagonist, iodo-resiniferatoxin: M. Rigoni, et al.; Br. J. Pharmacol. **138,** 977 (2003) ▪ Participation of the spinal TRPV1 receptors in formalin-evoked pain transduction: a study using a selective TRPV1 antagonist, iodo-resiniferatoxin: Y. Kanai, et al.; J. Pharm. Pharmacol. **58,** 489 (2006)



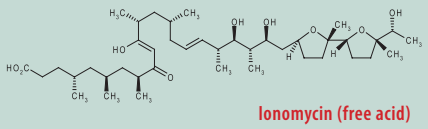
5′-Iodo-resiniferatoxin

Ionomycin (free acid)

ALX-450-006-M001 1 mg
ALX-450-006-M005 5 mg

Isolated from *Streptomyces conglobatus*. Potent and selective calcium ionophore. Ca^{2+}/ionomycin complex forms between pH 7-9.5 which has intense UV absorption. Induces apoptotic neuronal degeneration in embryonic cortical neurons and cell cycle arrest at G1 phase.

CAS: 56092-81-0



Ionomycin (free acid)

Ionomycin . Ca

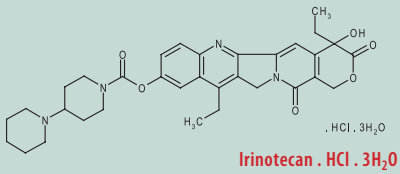
ALX-450-007-M001 1 mg
ALX-450-007-M005 5 mg

Isolated from *Streptomyces conglobatus*. For technical information and literature references see Ionomycin (free acid) (Prod. No. ALX-450-006).

Irinotecan . HCl . $3H_2O$ [Camptosar]

ALX-430-139-M005 5 mg
ALX-430-139-M025 25 mg

A member of the camptothecin drug family, and an inhibitor of the nuclear enzyme topoisomerase I, which is involved in cellular DNA replication and transcription. During replication topoisomerase I mediates the relaxation of super coiled DNA, and its inhibition results in breakage of the DNA chain and likely induce apoptosis. Irinotecan is, therefore, an attractive target for anticancer drug development. Currently it is used for the treatment of small cell lung cancer and advanced colorectal cancer.



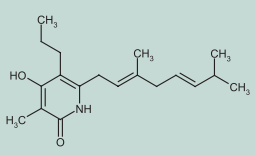
Irinotecan . HCl . $3H_2O$

Iromycin A

ALX-380-124-MC05 0.5 mg
ALX-380-124-M001 1 mg
ALX-380-124-M005 5 mg

Antibiotic. Isolated from *Streptomyces bottropensis*. Pyridone metabolite. Inhibitor of nitric oxide synthases (NOS) showing selectivity for eNOS (NOS III) versus nNOS (NOS I). Inhibitor of thaxtomine biosynthesis and of mitochondrial electron transport chain.

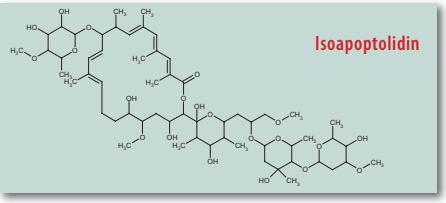
LIT: Iromycins: a new family of pyridone metabolites from Streptomyces sp. II. Convergent total synthesis: H. Shojaei, et al.; JOC **72,** 5091 (2007) ▪ The iromycins, a new family of pyridone metabolites from Streptomyces sp. I. Structure, NOS inhibitory activity, and biosynthesis: F. Surup, et al; JOC **72,** 5085 (2007)



Iromycin A

Islet-Activating Protein see Pertussis Toxin

Isoangoroside C see Angoroside C

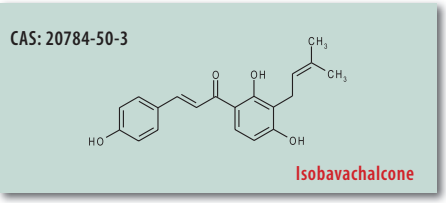


Isoapoptolidin

ALX-380-229-MC01 0.1 mg

Isolated from *Amycolatopsis sp.* MST-AS5912. Isomer of apoptolidin (Prod. No. ALX-380-207). In water an equilibrium mixture of apoptolidin:isoapoptolidin (~1.5:1) is formed within hours. Less active F_0F_1-ATPase inhibitor than apoptolidin.

LIT: Toward a stable apoptolidin derivative: identification of isoapoptolidin and selective deglycosylation of apoptolidin: J.D. Pennington, et al.; Org. Lett. **4,** 3823 (2002) ▪ Isoapoptolidin: structure and activity of the ring-expanded isomer of apoptolidin: P.A. Wender, et al.; Org. Lett. **4,** 3819 (2002)



Isobavachalcone

ALX-350-145-M001 1 mg

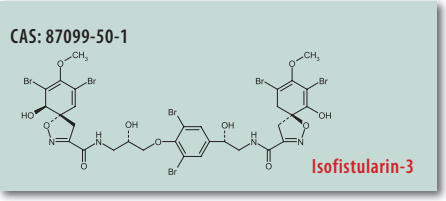
Isolated from plant *Psoralea corylifolia.* Inhibits platelet aggregation. Inhibitor of *Epstein-Barr* virus early antigen (EBV-EA) induction. Exhibits potent inhibitory effect on skin tumor promotion. Potent inhibitor of MMP-2. Displays DNA strand-scission (cleaving) activity. Shows antifungal activity.

Isochlorogenic acid see 3,5-Di-O-caffeoylquinic acid

Isofistularin-3

ALX-350-157-M001 1 mg

Isolated from *Aplysina aerophoba.* Cytotoxic alkaloid. Shows antibiotic properties. Inhibits cell growth *in vitro.*

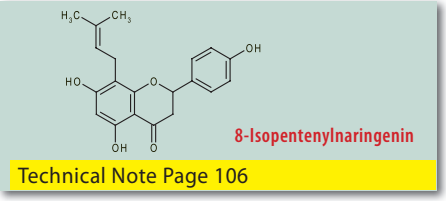


8-Isopentenylnaringenin [8-Prenylnaringenin]

Bulk

ALX-385-025-M005 5 mg

Prenyl flavonoid. Isolated from hops *(Humulus lupulus L.).* Phytoestrogen. Selective, non-steroidal estrogen receptor α (ERα) ligand. Potent inhibitor of angiogenesis *in vitro* and *in vivo*. Chemopreventive agent against cancer induced by heterocyclic amines.

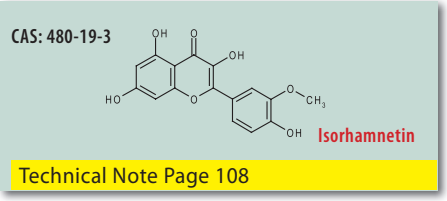


Technical Note Page 106

Isorhamnetin [3-Methylquercetin; 3′-Methoxy-3,4′,5,7-tetrahydroxyflavone]

ALX-385-024-M005 5 mg
ALX-385-024-M010 10 mg

Antiviral agent. Antioxidant. Antitumor compound. Apoptosis inducer.



Technical Note Page 108

Isotetrandrine [Berbamine methyl ether]

ALX-350-035-M001 1 mg

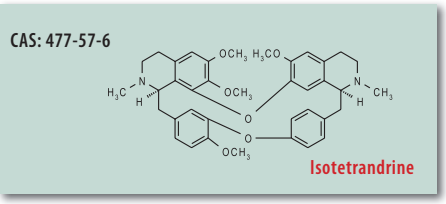
Alkaloid inhibitor of G-protein mediated activation of phospholipase A2 (PLA2) but not phospholipase C or D.

Isoxanthohumol

ALX-350-279-M001 1 mg

Synthetic. Prenylated chalcone. Phytoestrogen. Induces apoptosis in mature adipocytes.

LIT: Xanthohumol and related prenylflavonoids from hops and beer: to your good health!: J.F. Stevens & J.E. Page; Phytochemistry **65,** 1317 (2004) ▪ Inhibition of endothelial cell functions by novel potential cancer chemopreventive agents: E. Bertl, et al.; BBRC **325,** 287 (2004) ▪ Metabolism of xanthohumol and isoxanthohumol, prenylated flavonoids from hops (Humulus lupulus L.), by human liver microsomes: D. Nikolic, et al.; J. Mass Spectrom. **40,** 289 (2005) ▪ Identification of human hepatic cytochrome P450 enzymes involved in the metabolism of 8-prenylnaringenin and isoxanthohumol from hops (Humulus lupulus L.): J. Guo, et al.; Drug Metab. Dispos. **34,** 1152 (2006) ▪ The prenylflavonoid isoxanthohumol from hops (Humulus lupulus L.) is activated into the potent phytoestrogen 8-prenylnaringenin in vitro and in the human intestine: S. Possemiers, et al.; J. Nutr. **136,** 1862 (2006) ▪ Effect of xanthohumol and isoxanthohumol on 3T3-L1 cell apoptosis and adipogenesis: J.Y. Yang, et al.; Apoptosis **12,** 1953 (2007)



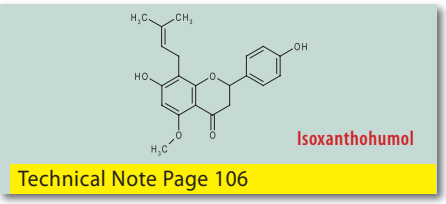
ISP-1 see Myriocin

Itamycin see Resistomycin

Joro Spider Toxin [JSTX-3]

ALX-630-077-C100 100 µg

Synthetic. Originally isolated from the spider *Nephila clavata.* Specific, irreversible inhibitor of excitatory postsynaptic potentials. Blocks post-synaptic glutamate potentials. Blocks quisqualate-sensitive glutamate receptors. However, aspartate-induced depolarization, nerve terminal spikes, resting membrane conductance, and inhibitory postsynaptic potentials are unaffected. Antiepileptic. Potent neurotoxin.



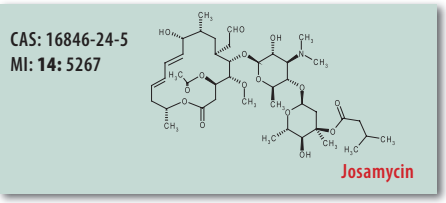
Technical Note Page 106

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).

JSTX-3 see Joro Spider Toxin



K-252a

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

Isolated from *Nocardiopsis sp.* Alkaloid isolated from soil fungi. General, cell permeable protein kinase inhibitor. Potent inhibitor of Ca^{2+}/calmodulin kinase II. Inhibits myosin light chain kinase, cAMP-dependent protein kinase (PKA), protein kinase C (PKC), and cGMP-dependent protein kinase (PKG). Induces apoptosis.

K-252b

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

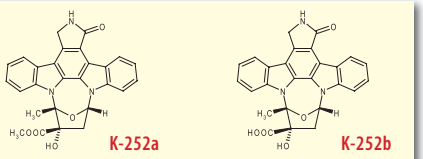
For technical information see product K-252a (Prod. No. ALX-380-027)

K-252c [Staurosporinone; Staurosporine Aglycone]

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

Inhibitor of protein kinase C (PKC). Aglycone of staurosporine. ***Technical Note Page 101.***

For BULK quantities please inquire!



K-252a K-252b

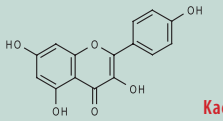
Technical Note Page 101

Kaempferol [3,4',5,7-Tetrahydroxyflavone]

ALX-385-005-M010 10 mg
ALX-385-005-M050 50 mg

Antioxidant flavonoid. Apoptosis inducer. Reversible inhibitor of fatty acid synthase (FAS).

CAS: 520-18-3
MI: **14:** 5274



Kaempferol

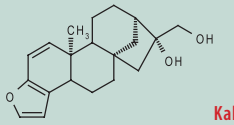
Technical Note Page 108

Kahweol

ALX-350-223-M010 10 mg

Natural product isolated from the unsaponifiable fraction of petroleum ether extract of coffee beans. Induces glutathione S-transferase. Has anti-cancer, chemoprotective, anti-inflammatory and anti-atherosclerotic properties.

CAS: 6894-43-5



Kahweol

Technical Note Page 106

Kaliotoxin

ALX-630-085-C010 10 µg

Synthetic. Originally isolated from *Androctonus mauretanicus mauretanicus* scorpion venom. High conductance Ca^{2+}-activated K^+ channel blocker. Highly selective for Kv1.1 and Kv1.3. Blocking of Kv1.3 inhibits T cell activation.

Kaliotoxin (1-37)

ALX-630-041-C100 100 µg

Synthetic. Originally isolated from *Androctonus mauretanicus mauretanicus.* High conductance Ca^{2+}-activated K^+ channel blocker.

H-Gly-Val-Glu-Ile-Asn-Val-Lys-Cys-Ser-Gly-Ser-Pro-Gln-Cys-Leu-Lys-Pro-Cys-Lys-Asp-Ala-Gly-Met-Arg-Phe-Gly-Lys-Cys-Met-Asn-Arg-Lys-Cys-His-Cys-Thr-Pro-Lys-OH (Disulfide bonds between Cys^8-Cys^{28}, Cys^{14}-Cys^{33} and Cys^{18}-Cys^{35})

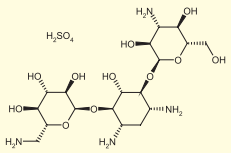
Kaliotoxin

Kanamycin . sulfate

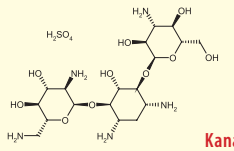
ALX-380-049-G001 1 g
ALX-380-049-G005 5 g

Isolated from *Streptomyces kanamyceticus.* Aminoglycoside antibiotic with broad antibacterial spectrum, including mycobacteria, many Gram-positive and most Gram-negative organisms. Acts by inhibiting bacterial protein synthesis. Kanamycin resistance is a widely used selection marker for obtaining transgenic plants.

LIT: Biological studies on kanamycin: T. Takeuchi, et al.; J. Antibiot. (Tokyo) **10,** 107 (1957) ▪ Antimicrobial agents--Part II. The aminoglycosides: streptomycin, kanamycin, gentamicin, tobramycin, amikacin, neomycin: N. S. Brewer; Mayo Clin. Proc. **52,** 675 (1977) ▪ Controversy associated with the common component of most transgenic plants - kanamycin resistance marker gene: S. Jelenic; Food Technol. Biotechnol. **41,** 183 (2003) ▪ Caspase-independent pathways of hair cell death induced by kanamycin in vivo: H. Jiang, et al.; Cell Death Differ. **13,** 20 (2006)



Kanamycin A . sulfate



Kanamycin B . sulfate

Kanamycin A . sulfate

ALX-380-275-G001 1 g
ALX-380-275-G005 5 g

Antibiotic. Isolated from *Streptomyces kanamyceticus.* Binds to the 70S ribosomal subunit. Inhibits translocation and elicits miscoding. Effective against Gram-negative and Gram-positive bacteria and mycoplasma.

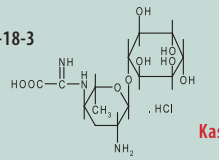
Kanamycin B . sulfate [Bekanamycin]

ALX-380-094-M250 250 mg

Isolated from *Streptomyces kanamyceticus.* Aminoglycoside antibiotic. Binds to the 70S ribosomal subunit. Inhibits translocation and elicits miscoding. Effective against Gram-negative and Gram-positive bacteria and mycoplasma.

Kanamycin B, Deoxy- see Tobramycin

CAS: 6980-18-3



Kasugamycin . HCl

Kasugamycin . HCl

ALX-380-076-G001 1 g

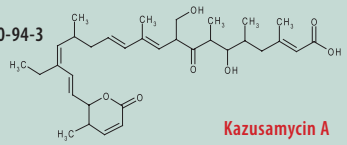
Isolated from *Streptomyces kasugaensis.* Unique aminoglycoside antibiotic with less potential to create cross-resistant human pathogens compared to other aminoglycoside antibiotics. Effective against Gram-negative bacteria. Used as a pesticide. Binds to the 30S subunit of bacterial ribosome and suppresses protein synthesis. Inhibits translation initiation of canonical but not of leaderless messenger RNAs.

Kazusamycin A [Kazusamycin; Hydroxyleptomycin B; Hydroxyelactocin; PD 114, 721]

ALX-380-230-MC01 0.1 mg

Isolated from *Streptomyces sp.* MST-AS4898. Shows potent antitumor activity *in vitro* and *in vivo* against several tumor cell lines. Has antibacterial and antifungal activities. Inhibitor of nuclear export.

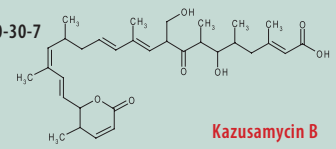
CAS: 92090-94-3



Kazusamycin A

Technical Note Page 93

CAS: 107140-30-7



Kazusamycin B

Technical Note Page 93

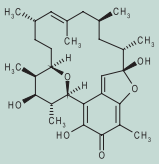
Kazusamycin B

[Hydroxyleptomycin A; Antibiotic CL 1957E; PD 124, 895]

ALX-380-231-MC01 0.1 mg

Isolated from *Streptomyces sp.* MST-AS4898. Shows potent antitumor activity *in vitro* and *in vivo* against several tumor cell lines, including L1210 and P388 leukemia cells. Has antibacterial and antifungal activities.

CAS: 59785-91-0



Kendomycin

Kendomycin

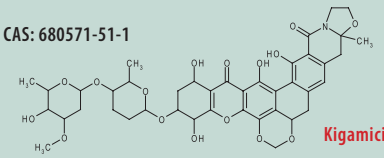
[(-)-TAN 2162]

ALX-380-066-C100 100 µg
ALX-380-066-C500 500 µg

Isolated from *Streptomyces violaceoruber.* Potent endothelin receptor antagonist. Anti-osteoporotic compound. Shows remarkable antibacterial and cytotoxic activity. Mediates its cytotoxic effects, at least in part, through proteasome inhibition.

LIT: Structure and biosynthesis of kendomycin, a carboxylic ansa-compound from Streptomyces: A.Zeeck & H.B. Bode; JCS Perkin Trans. **2000**, 323 ▪ Evidence for the mode of action of the highly cytotoxic Streptomyces polyketide kendomycin: Y.A. Elnakady, et al.; Chembiochem. **8**, 1261 (2007)

CAS: 680571-51-1



Kigamicin C

Kigamicin C

ALX-380-213-MC05 0.5 mg

Isolated from *Amycolatopsis sp.* MST-AS4724. Antitumor antibiotic. Inhibits the growth of Gram-positive bacteria including MRSA.

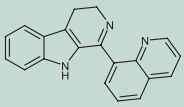
Komarovidine

[3-(Quinolin-8′-yl)-5,6-dihydro-β-carboline]

ALX-350-351-M001 1 mg
ALX-350-351-M005 5 mg

Synthetic. Originally isolated from *Nitraria komarovii.* Alkaloid.

CAS: 76971-22-7



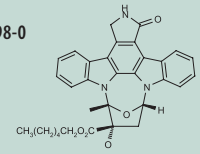
Komarovidine

KT5720

ALX-270-075-C100 100 µg
ALX-270-075-C500 500 µg
ALX-270-075-M001 1 mg

Semisynthetic. Potent, reversible, cell permeable and selective inhibitor of cAMP-dependent protein kinase (PKA).

CAS: 108068-98-0



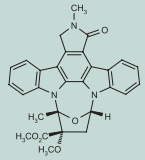
KT5720

KT5823

ALX-270-087-C100 100 µg
ALX-270-087-C500 500 µg
ALX-270-087-M001 1 mg

Semisynthetic. Potent and selective inhibitor of cGMP-dependent protein kinase (PKG).

CAS: 126643-37-6

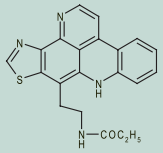


KT5823

Kuanoniamine C

ALX-350-262-M001 1 mg

Isolated from the sponge *Oceanapia spec.* Inhibits proliferation of several cell lines. Binds to adenosine receptor subtypes A1 and A2A.



Kuanoniamine C

L-681,110A1 see **Bafilomycin C_1**

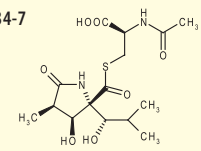
Lactacystin (native)

Bulk

ALX-350-245-MC01 0.1 mg
ALX-350-245-MC05 0.5 mg
ALX-350-245-M001 1 mg

Isolated from *Streptomyces sp.* Cell permeable and irreversible proteasome inhibitor. Specifically inhibits 26S proteasome (MCP; multicatalytic proteinase complex). Blocks proteasome activity by targeting the catalytic β-subunit. Has no effect on serine or cysteine proteases. Induces apoptosis in human monoblast U937 cells. Also inhibits NF-κB activation by inhibiting IκB degradation. Inhibits the ubiquitin proteasome pathway in cell culture. Inhibits cathepsin A. Upregulates HSP70 and HSP22, suggesting an initial neuroprotective pathway.

CAS: 133343-34-7



Lactacystin

Lactacystin (synthetic)

ALX-350-260-MC01 0.1 mg
ALX-350-260-M001 1 mg

Synthetic. For technical information see product Lactacystin (native) (Prod. No. ALX-350-245).

clasto-Lactacystin β-lactone (synthetic)

ALX-270-280-C200 200 µg
ALX-270-280-M001 1 mg

Synthetic. Highly specific, cell permeable, and irreversible 20S proteasome inhibitor. Inhibits ubiquitin proteasome pathway in cell culture. It has suggested that the natural product lactacystin acts as a precursor for *clasto*-lactacystin β-lactone and that the latter is the sole species that interacts with the proteasome. Inhibits cathepsin A. Leads to a reduction of adipogenesis.

Lambdamycin see **Chartreusin**

α-Latrotoxin

ALX-630-027-C040 40 µg

Isolated from *Latrodectus tredecimguttatus.* Causes massive neurotransmitter release from a wide variety of central and peripheral synaptic junctions of vertebrates using Ca^{2+}-dependent and Ca^{2+}-independent pathways. A useful pharmacological tool in the studies of synaptic vesicles exocytosis of different neutrotransmitters.

Latrunculin A

ALX-350-130-C100 100 µg

Isolated from *Latrunculia magnifica*. Inhibits actin polymerization via a different mechanism and 10- to 20-fold more potently than cytochalasins. Inhibits phagocytosis by macrophages.

Latrunculin B

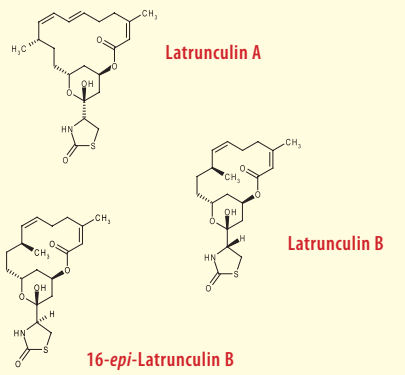
ALX-350-036-C100 100 µg
ALX-350-036-M001 1 mg

Isolated from *Latrunculia magnifica*. Structurally unique marine toxin. Actin filament modulator. 10- to 100-fold more potent than cytochalasins. Whereas cytochalasin D (Prod. No. ALX-380-031) induces dissolution of F-actin and stress fiber contraction in fibroblasts in culture, latrunculin B causes a shortening and thickening of stress fibers.

16-*epi*-Latrunculin B

ALX-350-359-C100 100 µg

Isolated from *Negombata magnifica*. Has antiviral (herpes simplex type 1) activities and cytotoxic properties.



Lavendustin A [RG14355]

ALX-350-007-M001 1 mg
ALX-350-007-M005 5 mg

Synthetic. Cell permeable tyrosine kinase inhibitor with little effect on cAMP-dependent protein kinase (PKA) or protein kinase C (PKC). Inhibits autophosphorylation of EGFRs. Also inhibits NMDA-stimulated cGMP production.

Lavendustin A methyl ester

ALX-350-091-M001 1 mg
ALX-350-091-M005 5 mg

Cell permeable ester of lavendustin A (Prod. No. ALX-350-007).

Lavendustin B

ALX-350-037-M001 1 mg

Synthetic. Control for lavendustin A (Prod. No. ALX-350-007); 100-fold less potent than lavendustin A.

Lavendustin C [Compound 5]

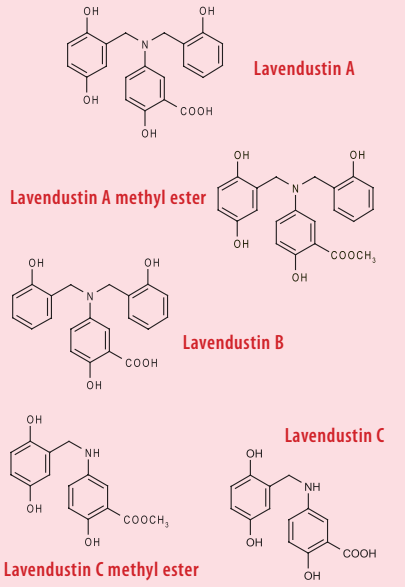
ALX-270-066-M001 1 mg

Synthetic. Potent inhibitor of protein tyrosine kinases and Ca^{2+}/calmodulin-dependent kinase II. Acts also as an inhibitor of EGFR tyrosine kinase and pp60c-src kinase.

Lavendustin C methyl ester [Compound 5 methyl ester]

ALX-350-084-M001 1 mg
ALX-350-084-M005 5 mg

Synthetic. Inhibitor of EGFR tyrosine kinase with improved bioavailability over lavendustin C (Prod. No. ALX-270-066).



Leptomycin A [ATS1287 A; LMA]

ALX-380-101-C050 50 µg
ALX-380-101-C100 100 µg

Isolated from *Streptomyces sp.* Antifungal antibiotic that acts as an inhibitor of nuclear export by interacting with CRM1/exportin-1. Inhibits nucleo-cytoplasmic translocation of molecules such as the HIV-1 Rev protein and Rev-dependent export of mRNA.

Leptomycin A, 5-Demethyl- see Anguinomycin A

Leptomycin A, Hydroxy- see Kazusamycin B

Leptomycin B [LMB]

ALX-380-100-C100 100 µg

Isolated from *Streptomyces sp.* Antifungal antibiotic that acts as an inhibitor of nuclear export by interacting with CRM1/exportin-1. Inhibits nucleo-cytoplasmic translocation of molecules such as the HIV-1 Rev protein and Rev-dependent export of mRNA. Other proteins that are influenced by leptomycin B are actin, c-Abl, cyclin B1, MDM2/p53, Iκb, MPF and PKA.

Leptomycin Set I

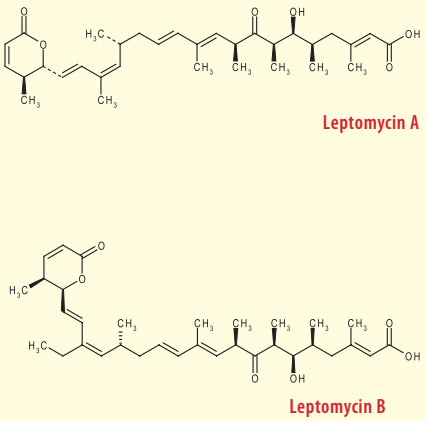
ALX-850-313-KI01 1 Set

CONTAINS: 1x100µg of Leptomycin A (Prod. No. ALX-380-101), 1x100µg of Leptomycin B (Prod. No. ALX-380-100). ***Technical Note Page 93.***

Leptomycin Set II

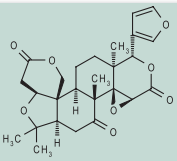
ALX-850-316-KI01 1 Set

CONTAINS: 1x100µg of Leptomycin A (Prod. No. ALX-380-101), 1x100µg of Leptomycin B (Prod. No. ALX-380-100), 1x5µg of Ratjadone C (native) (Prod. No. ALX-270-369). ***Technical Note Page 93.***



Technical Note Page 93

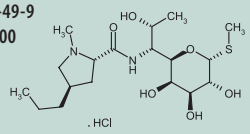
CAS: 1180-71-8
MI: **14:** 5494



Limonin

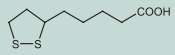
Technical Note Page 105

CAS: 7179-49-9
MI: **14:** 5500



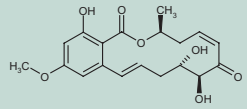
Lincomycin . HCl

CAS: 1077-28-7
MI: **14:** 9326



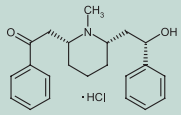
LL-Z1640-2

CAS: 66018-38-0



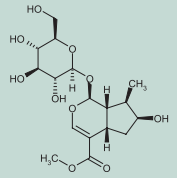
DL-α-Lipoic acid

CAS: 134-63-4
MI: **14:** 5551



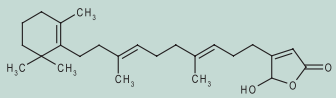
Lobeline . HCl

CAS: 18524-94-2
MI: **14:** 5560



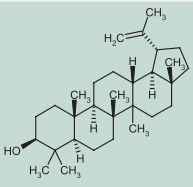
Loganin

CAS: 111149-87-2



Luffariellolide

CAS: 545-47-1
MI: **14:** 5608



Lupeol

Leukocristine . sulfate see **Vincristine sulfate**

Leukoharmine see **Harmine**

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. Inhibits HIV-1 replication. Shows antinociceptive effect. Does not possess any inherent antioxidant activity.

Lincomycin . HCl

ALX-380-276-UM01 1 MU

Antibiotic. Isolated from *Streptomyces lincolnensis*. Forms cross-links within the peptidyl transferase loop region of the 23S rRNA. Inhibits bacterial protein synthesis. Effective against Gram-positive bacteria.

Lipid A – For Details see next page

DL-α-Lipoic acid

[DL-6,8-Thioctic acid]

ALX-270-266-G001 1 g
ALX-270-266-G005 5 g

Antioxidant.

Lipopolysaccharides – For Details see next page

LL-Z1272 γ see **Ascochlorin**

LL-Z1640-2

ALX-380-267-M001 1 mg
ALX-380-267-M005 5 mg

Isolated from *Deuteromycetes sp.* Inhibitor of the JNK/p38 pathways. Inhibits anisomycin-induced but not TNF-induced JNK/p38 activation. Potent protein kinase inhibitor.

Lobeline . HCl

[L-Lobeline]

ALX-420-023-M050 50 mg
ALX-420-023-M250 250 mg
ALX-420-023-G001 1 g

Neuronal nicotinic acetylcholine receptor agonist. Respiratory stimulant.

Loganin

ALX-350-363-M025 25 mg
ALX-350-363-M100 100 mg

Isolated from *Cornus officinalis*. Iridoid glycoside associated with immunostimmulatory and hepatoprotective activity. Key starting material for the biosynthesis of indolalkaloids. Substrate for cytochrome P450.

LPS – For Details see next page

Luffariellolide

ALX-350-038-M001 1 mg

Isolated from sponge *Luffariella sp.* Structurally related to manoalide (Prod. No. ALX-350-045). Anti-inflammatory phospholipase A2 (PLA2) inhibitor. Less potent than manoalide, but partially reversible. Inhibits human recombinant sPLA2 selectively over cPLA2.

Lupeol

[Fagarasterol]

ALX-350-355-M010 10 mg
ALX-350-355-M050 50 mg
ALX-350-355-G001 1 g

Isolated from *Lupinus polyphyllus*. Anti-inflammatory, antioxidant and antimutagenic compound. Shows preventive effects on DMBA induced DNA alkylation damage in mouse skin. Modulator of NF-κB and PI(3)K/Akt (protein kinase B; PKB) pathways. Induces Fas-mediated apoptosis via inhibition of Ras signalling. Inhibits tumor growth in mouse *in vivo*.

LPS [Lipopolysaccharides] – TLR*grade*™

Sterile, ready-to-use liquid formulation - no hazardous handling! No further purification required! Potent and selective activators of TLR4 (10-1000 ng/ml). Ultrapure (≥99.9%) - Concentration: 1 mg/ml.

ALX-581-015-L002	**LPS from *Salmonella minnesota* R345 (Rb) (TLR*grade*™) (liquid)**	2 ml
ALX-581-017-L002	**LPS from *Salmonella minnesota* R5 (Rc) (TLR*grade*™) (liquid)**	2 ml
ALX-581-018-L002	**LPS from *Salmonella minnesota* R7 (Rc) (TLR*grade*™) (liquid)**	2 ml
ALX-581-008-L002	**LPS from *Salmonella minnesota* R595 (Rc) (TLR*grade*™) (liquid)**	2 ml
ALX-581-010-L002	**LPS from *E. coli*, Serotype EH100 (Ra) (TLR*grade*™) (liquid)**	2 ml
ALX-581-014-L002	**LPS from *E. coli*, Serotype J5 (Rc) (TLR*grade*™) (liquid)**	2 ml
ALX-581-007-L002	**LPS from *E. coli*, Serotype R515 (Re) (TLR*grade*™) (liquid)**	2 ml
ALX-581-012-L002	**LPS from *E. coli*, Serotype 0111:B4 (TLR*grade*™) (liquid)**	2 ml
ALX-581-013-L002	**LPS from *E. coli*, Serotype 055:B5 (TLR*grade*™) (liquid)**	2 ml
ALX-581-009-L002	**LPS from *Salmonella abortus equi* S-form (TLR*grade*™) (liquid)**	2 ml
ALX-581-011-L002	**LPS from *Salmonella typhimurium* S-form (TLR*grade*™) (liquid)**	2 ml
ALX-581-019-L002	**LPS from *Salmonella enteritidis* S-form (TLR*grade*™) (liquid)**	2 ml
ALX-581-020-L002	**LPS from *Salmonella minnesota* S-form (TLR*grade*™) (liquid)**	2 ml

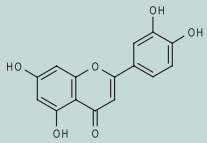
Lipid A – TLR*grade*™

Sterile, ready-to-use liquid formulation - no hazardous handling! No further purification required! Potent and selective activators of TLR4 (10-1000 ng/ml). Ultrapure (≥99.9%) - Concentration: 1 mg/ml.

ALX-581-200-L002	**Lipid A from *E. coli*, Serotype R515 (TLR*grade*™) (liquid)**	2 ml
ALX-581-201-L002	**Lipid A from *Salmonella minnesota* R595 (Re) (TLR*grade*™) (liquid)**	2 ml
ALX-581-202-L002	**Lipid A (Monophosphoryl) [MPL-A] from *Salmonella minnesota* R595 (Re) (TLR*grade*™) (liquid)**	2 ml

For Technical Notes on LPS [Lipopolysaccharides] & Lipid A see Page 94 / 95

CAS: 491-70-3
MI: **14:** 5614



Luteolin

Luteolin [3′,4′,5,7-Tetrahydroxyflavone]

ALX-385-007-M010 10 mg
ALX-385-007-M050 50 mg

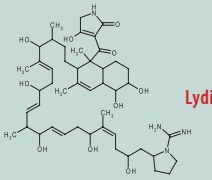
Antioxidant flavonoid. Inhibits VEGF-induced angiogenesis. Inhibitor of the catalytic activity of phosphoinositide 3-kinase (PI(3)K), whereas inhibition of PI(3)K by luteolin affects apoptosis via PI(3)K/Akt (protein kinase B; PKB) pathways and antimitotic effects via PI(3)K/p70S6K pathways. Inhibitor of fatty acid synthase (FAS). Apoptosis inducer.

Lydicamycin

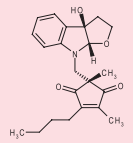
ALX-380-232-MC05 0.5 mg

Isolated from *Streptomyces sp.* MST-AS5376. Shows antibacterial activities against Gram-positive bacteria. Highly active against MRSA.

CAS: 133352-27-9



Lydicamycin



(+)-Madindoline A

Technical Note Page 96

(+)-Madindoline A [MadA; MDL-A]

Bulk

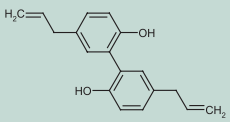
ALX-350-328-MC05 0.5 mg
ALX-350-328-M001 1 mg

Synthetic. Madindolines are noncytotoxic indole alkaloids originally isolated from a fermentation broth of *Streptomyces nitrosporeus* K93-0711. (+)-Madindoline A (MadA; MDL-A) and (+)-madindoline B (MadB; MDL-B) are diastereomers with MadA being the more potent compound. MadA 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, thus inhibiting activation of the JAK/STAT signal transduction pathway. MadA inhibits IL-6 and IL-11-induced osteoclastogenesis *in vitro* in a dose dependent manner and postmenopausal osteoporosis *in vivo*, by a mechanism different from that of 17β-estradiol. IL-6 activity is known to cause various diseases such as cancer cachexia, Castleman's disease, Crohn's disease, rheumatoid arthritis, hypercalcemia, and multiple myeloma. Madindolines are no longer available from natural sources due to mutation of the originating bacterial strain. Thus, synthetic routes have been developed to produce madindolines. Recently analogs of madindolines have been synthesized as potent IL-6 inhibitors.

LIT: Pathogenic significance of interleukin-6 (IL-6/BSF-2) in Castleman's disease: K. Yoshizaki, et al.; Blood **74,** 1360 (1989) ▪ Granulocyte-macrophage colony-stimulating factor synergizes with interleukin-6 in supporting the proliferation of human myeloma cells: X.G. Zhang, et al.; Blood **76,** 2599 (1990) ▪ Mechanisms of experimental cancer cachexia. Local involvement of IL-1 in colon-26 tumor: G. Strassmann, et.al.; J. Immunol. **150,** 2341 (1993) ▪ Association of transcription factor APRF and protein kinase Jak1 with the interleukin-6 signal transducer gp130: C. Lutticken, et al.; Science **263,** 89 (1994) ▪ Interleukin-6 enhances hypercalcemia and bone resorption mediated by parathyroid hormone-related protein in vivo: J. de la Mata, et al.; J. Clin. Invest. **95,** 2846 (1995) ▪ 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. (Tokyo) **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. (Tokyo) **50,** 1069 (1997) ▪ Blockage of interleukin-6 receptor ameliorates joint disease in murine collagen-induced arthritis: N. Takagi, et al.; Arthritis Rheum. **41,** 2117 (1998) ▪ Suppression of bone resorption by madindoline A, a novel nonpeptide antagonist to gp130: M. Hayashi, et al.; PNAS **99,** 14728 (2002) ▪ Inhibition of IL-6 for the treatment of inflammatory diseases: N. Nishimoto & T. Kishimoto; Curr. Opin. Pharmacol. **4,** 386 (2004) ▪ Binding of madindoline A to the extracellular domain of gp130: A.Z. Saleh, et al.; Biochemistry **44,** 10822 (2005) ▪ Design, synthesis, and biological activities of madindoline analogues: D. Yamamoto, et al.; Bioorg. Med. Chem. Lett. **16,** 2807 (2006) ▪ Synthesis of (+)-madindoline A and (+)-madindoline B: L. Wan & M.A. Tius; Org. Lett. **9,** 647 (2007) ▪ Efficient total synthesis of novel bioactive microbial metabolites: T. Sunazuka, et al.; Acc. Chem. Res. **41,** 302 (2008)

Product from The Kitasato Institute, Tokyo.

CAS: 528-43-8
MI: **14:** 5697



Magnolol

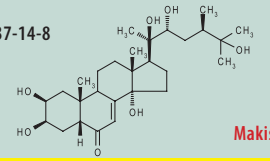
Magnolol [5,5′-Diallyl-2,2′-biphenyldiol]

Bulk

ALX-350-352-M005 5 mg
ALX-350-352-M025 25 mg

Isolated from *Magnolia officinalis.* Potent and highly tolerable antitumor and antiangiogenic compound. Anxiolytic, anti-thrombotic and antibacterial. Shows central depressant effects *in vivo*. Inhibitor of nitric oxide (NO) and TNF-α production in LPS-activated macrophages by the suppression of inducible nitric oxide synthase (iNOS; NOS II) expression. Isomeric with honokiol (Prod. No. ALX-350-350).

CAS: 20137-14-8



Makisterone A

Technical Note Page 87

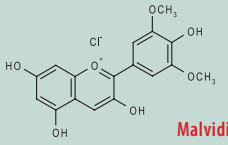
Makisterone A

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

Ecdysteroid.

Mallotoxin see Rottlerin

CAS: 643-84-5
MI: **14:** 5715



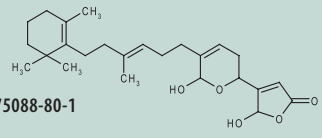
Malvidin chloride

Malvidin chloride [3,4′,5,7-Tetrahydroxy-3′,5′-dimethoxyflavylium chloride]

ALX-385-013-M010 10 mg

Antioxidant flavonoid. Antitumor compound. Induces cell cycle arrest in the G2/M-phase.

CAS: 75088-80-1



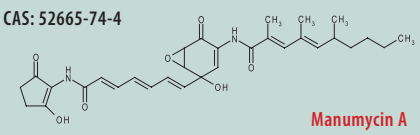
Manoalide

Manoalide

ALX-350-045-C100 100 µg
ALX-350-045-M001 1 mg

Isolated from *Luffariella variabilis.* Inhibits irreversibly phospholipase A2 (PLA2) by covalently modifying lysine residues. Also inhibits phospholipase C (PLC) and Ca^{2+} channels. Inhibits superoxide generation in polymorphonuclear leukocytes. Has anti-inflammatory and analgesic properties. Shows strong quorum sensing antagonism.

CAS: 52665-74-4



Manumycin A

Manumycin A

Bulk

ALX-350-241-M001 1 mg
ALX-350-241-M005 5 mg
ALX-350-241-M010 10 mg

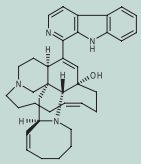
Isolated from *Streptomyces parvulus.* Potent, selective and competitive inhibitor of Ras farnesyltransferase. Does not affect geranylgeranyltransferase. Inhibition is competitive with respect to farnesyl pyrophosphate and non-competitive with respect to Ras. Inhibits neutral sphingomyelinase.

Manzamine A

ALX-350-294-M001 1 mg

Isolated from *Xestospongia sp.* β-Carboline alkaloid with anti-inflammatory, antimalarial, antifungal, anti-HIV-1, and insecticidal activity. Active against the Gram-positive bacteria *Bacillus subtilis* and *Staphylococcus aureus*. Inhibits GSK-3. Has native fluorescence, highest when solubilized in methanol (Ex: 340nm, Em: 387nm).

CAS: 104196-68-1



Manzamine A

Margatoxin

ALX-630-045-C100 100 µg

Synthetic. Originally isolated from *Centruroides margaritatus*. Voltage dependent K^+ channel blocker (specific for Kv1.3 channel). Inhibitor of T cell activation. Immunosuppressor.

H-Thr-Ile-Ile-Asn-Val-Lys-Cys-Thr-Ser-Pro-Lys-Gln-Cys-Leu-Pro-Pro-Cys-Lys-Ala-Gln-Phe-Gly-Gln-Ser-Ala-Gly-Ala-Lys-Cys-Met-Asn-Gly-Lys-Cys-Lys-Cys-Tyr-Pro-His-OH (Disulfide bonds between Cys^7-Cys^{29}, Cys^{13}-Cys^{34} and Cys^{17}-Cys^{36})

Margatoxin

Mastoparan

ALX-162-001-M001 1 mg
ALX-162-001-M005 5 mg

Synthetic. Originally isolated from wasp venom. Mast cell degranulating peptide. Stimulates glycogenolysis. Stimulates phospholipase D2 (PLD2) activity. Alters G-proteins in brain membranes.

H-Ile-Asn-Leu-Lys-Ala-Leu-Ala-Ala-Leu-Ala-Lys-Lys-Ile-Leu-NH_2

Mastoparan

MCD Peptide

ALX-162-002-MC05 0.5 mg

Synthetic. Originally isolated from *Apis mellifera*. Potent anti-inflammatory agent and strong mediator of mast cell degranulation and histamine release. Neurotoxin and voltage-dependent K^+ channel blocker. Inhibits the ADP-ribosylation of the small GTP-binding proteins rho.

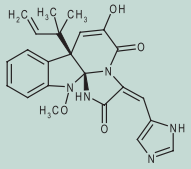
H-Ile-Lys-Cys-Asn-Cys-Lys-Arg-His-Val-Ile-Lys-Pro-His-Ile-Cys-Arg-Lys-Ile-Cys-Gly-Lys-Asn-NH_2 (Disulfide bonds between Cys^3-Cys^{15} and Cys^5-Cys^{19})

MCD Peptide

Meleagrin

ALX-350-297-M001 1 mg

Isolated from *Penicillium meleagrinum*. Antibiotic.



Meleagrin

LIT: The biosynthesis of low-molecular-weight nitrogen-containing secondary metabolite-alkaloids by the resident strains of Penicillium chrysogenum and Penicillium expansum isolated on the board of the Mir space station: A.G. Kozlovskii, et al.; Mikrobiologiia **71,** 773 (2002) ▪ Formation of alkaloids from Penicillium species fungi during growth on wheat kernels: N.G. Vinokurova, et al.; Prikl. Biokhim. Mikrobiol. **39,** 457 (2003) ▪ Roquefortine/oxaline biosynthesis pathway metabolites in Penicillium ser. Corymbifera: in planta production and implications for competitive fitness: D.P. Overy, et al.; J. Chem. Ecol. **31,** 2373 (2005)

Melittin (natural)

ALX-162-006-M001 1 mg
ALX-162-006-M005 5 mg

Isolated from bee venom. Causes disruption of normal cellular activity and cell lysis. Binds calmodulin in a calcium-dependent manner. Activates phospholipase A2 (PLA2) and inhibits protein kinase C (PKC) by binding to the catalytic domain in a Mg-ATP sensitive manner. Antirheumatic.

H-Gly-Ile-Gly-Ala-Val-Leu-Lys-Val-Leu-Thr-Thr-Gly-Leu-Pro-Ala-Leu-Ile-Ser-Trp-Ile-Lys-Arg-Lys-Arg-Gln-Gln-NH_2

Melittin

Melittin (synthetic)

ALX-162-007-MC05 0.5 mg
ALX-162-007-M001 1 mg

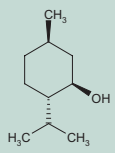
Synthetic. For technical information and literature references see product Melittin (natural) (Prod. No. ALX-162-006).

(-)-Menthol

ALX-420-042-M025 25 mg
ALX-420-042-M100 100 mg

Cooling agent. Strongly activates TRPM8 (cold menthol receptor 1; CMR1) and TRPA1.

CAS: 2216-51-5
MI: **14:** 5837



(-)-Menthol

LIT: Identification of a cold receptor reveals a general role for TRP channels in thermosensation: D.D. McKemy, et al.; Nature **416,** 52 (2002) ▪ TRPM8 activation by menthol, icilin, and cold is differentially modulated by intracellular pH: D.A. Andersson, et al.; J. Neurosci. **24,** 5364 (2004) ▪ Sensing with TRP channels: T. Voets, et al.; Nat. Chem. Biol. **1,** 85 (2005) ▪ Analgesia mediated by the TRPM8 cold receptor in chronic neuropathic pain: C.J. Proudfoot, et al.; Curr. Biol. **16,** 1591 (2006) ▪ Bimodal action of menthol on the transient receptor potential channel TRPA1: Y. Karashima, et al.; J. Neurosci. **27,** 9874 (2007) ▪ The menthol receptor TRPM8 is the principal detector of environmental cold: D.M. Bautista, et al.; Nature **448,** 204 (2007)

3′-Methoxy-3,4′,5,7-tetrahydroxyflavone see Isorhamnetin

3-Methylquercetin see Isorhamnetin

8-Methyl-N-vanillylnonanamide see Dihydrocapsaicin

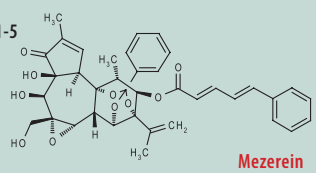
***trans*-8-Methyl-N-vanillyl-6-nonenamide see (E)-Capsaicin**

Mezerein (high purity)

ALX-350-042-M001 1 mg

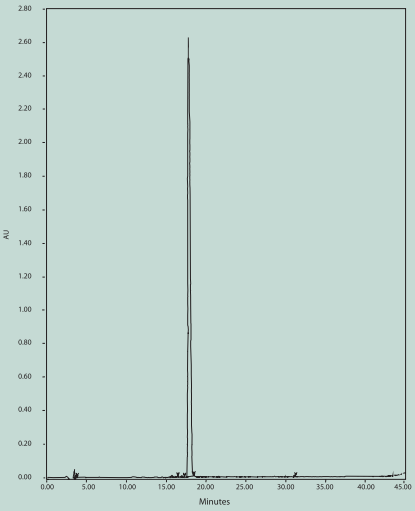
Isolated from *Daphne mezereum*. Protein kinase C (PKC) activator. Second stage tumor promoter whereas phorbol-12-myristate 13-acetate (PMA) (Prod. No. ALX-445-004) is a first stage tumor promoter. May be of use for studying phorbol ester receptor isotypes. Induces interleukin-1α. Coinducer of interferon with phytohemagglutinin.

CAS: 34807-41-5



Mezerein

Technical Note Page 88 - 90



HPLC Spectrum of Microcystin-LR

Step up to the Source™

Widest Panel of Microcystins

Isolated from *Microcystis aeruginosa*

Microcystin-LA

ALX-350-096-C025 25 µg
ALX-350-096-C100 100 µg

Analog of microcystin-LR (Prod. No. ALX-350-012) with Ala substituted in place of Arg. Inhibits protein phosphatase 2A (PP2A) and protein phosphatase 3 (PP3) more potently than protein phosphatase 1 (PP1).

Microcystin-LF

ALX-350-081-C025 25 µg
ALX-350-081-C100 100 µg

Analog of microcystin-LR (Prod. No. ALX-350-012) with Phe substituted in place of Arg. Hydrophobic and believed to be more cell permeable than other microcystins. More toxic than the more hydrophilic analogs such as microcystin-LR and microcystin-LY.

Microcystin-LR

Bulk

ALX-350-012-C050 50 µg
ALX-350-012-C100 100 µg
ALX-350-012-C500 500 µg
ALX-350-012-M001 1 mg

Equally potent and selective inhibitor of protein phosphatase 1 (PP1) and 2A (PP2A). PP2B is less sensitive and PP2C is not inhibited up to 4µM. Useful for affinity-purification of PP2A. The product is not cell permeable except in liver cells. Has no effect on protein kinases. Less toxic than the more hydrophobic analogs microcystin-LY, -LW and -LF.

Microcystin-LW

ALX-350-080-C025 25 µg
ALX-350-080-C100 100 µg

Analog of microcystin-LR (Prod. No. ALX-350-012) with Trp substituted in place of Arg. Hydrophobic and believed to be more cell permeable than other microcystins. Microcystin-LW has a characteristically different absorption spectrum compared to other microcystins, making it a useful reference compound for HPLC analysis. The Trp confers an absorption maximum at 222nm, whereas most microcystins have a characteristic maximum at 239nm.

Microcystin-LY

ALX-350-148-C025 25 µg
ALX-350-148-C100 100 µg

Analog of microcystin-LR (Prod. No. ALX-350-012) with Tyr substituted in place of Arg. Its toxicity is intermediate between the more toxic microcystin-LF and the less toxic microcystin-LR.

Microcystin-RR

ALX-350-043-C050 50 µg
ALX-350-043-C100 100 µg
ALX-350-043-C250 250 µg
ALX-350-043-C500 500 µg
ALX-350-043-M001 1 mg

Arg-Arg analog of microcystin-LR (Prod. No. ALX-350-012). Hepatotoxic, although found to be up to 10-fold less toxic than microcystin-LR on i.p. injection in mice. Potent inhibitor of protein phosphatase 2A (PP2A).

Microcystin-YR

ALX-350-044-C025 25 µg
ALX-350-044-C100 100 µg

Analog of microcystin-LR (Prod. No. ALX-350-012) with Tyr substituted in place of Leu. As for all microcystins the conjugated double bonds in the ADDA moiety cause a characteristic absorption maximum at 238nm. The Tyr residue in position 2 of microcystin-YR confers an absorption maximum at 232nm. Potent inhibitor of eukaryotic protein phosphatases 1 and 2A.

Microcystins (Adda specific) ELISA Kit

ALX-850-319-KI01 1 Kit

QUANTITY: 96 wells (~80 tests). **SENSITIVITY:** 0.1µg/l (range 0.15 to 5µg/l). For the quantitative and sensitive congener-independent detection of microcystins and nodularin in water samples. Polyclonal antibody prepared against the Adda moiety binds to microcystins and nodularins, allowing the congener-independent determination of these toxins and many of its congeners, and does not cross-react with other non-related toxins or compounds. Patented technology. U.S. Patent No. 6,967,240 Worldwide Patent PCT WO 01/18059 A2.

Manufactured by Abraxis LLC.

LIT: Congener-independent immunoassay for microcystins and nodularins: W.J. Fischer, et al.; Environ. Sci. Technol. **35,** 4849 (2001) ▪ A review of analytical methods for assessing the public health risk from microcystin in the aquatic environment: P.R. Hawkins, et al.; J. Water Supply **54,** 509 (2005)

Microcystins-DM ELISA Kit

ALX-850-324-KI01 1 Kit

QUANTITY: 96 wells (~80 tests). **SENSITIVITY:** 0.1ng/l (range 0.15 to 5ng/l). For the quantitative and sensitive detection of microcystins and nodularin in water samples. U.S. Patent No. 6,967,240 Worldwide Patent PCT WO 01/18059 A2.

Manufactured by Abraxis LLC.

LIT: Development of a direct competitive microcystin immunoassay of broad specificity: M.G. Weller, et al.; Anal. Sci. **17,** 1445 (2001)

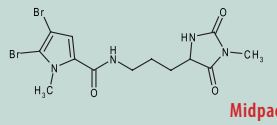
Midostaurin see PKC412

Midpacamide

ALX-350-327-M005 5 mg

Isolated from the sponge *Agelas longissima.* Alkaloid. Antimicrobial activity.

CAS: 66067-05-8



Midpacamide

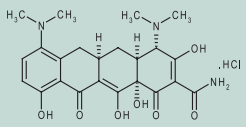
Minocycline . HCl

ALX-380-109-M050 50 mg

Semisynthetic. Tetracycline derivative with antimicrobial activity. Inhibitor of angiogenesis, apoptosis and PARP-1. Anti-inflammatory and neuroprotective.

LIT: Local delivery of minocycline and systemic BCNU have synergistic activity in the treatment of intracranial glioma: J.L. Frazier, et al.; J. Neurooncol. **64,** 203 (2003) ▪ Minocycline exerts multiple inhibitory effects on vascular endothelial growth factor-induced smooth muscle cell migration: the role of ERK1/**2,** PI3K, and matrix metalloproteinases: J.S. Yao, et al.; Circ. Res. **95,** 364 (2004) ▪ Minocycline up-regulates Bcl-2 and protects against cell death in mitochondria: J. Wang, et al.; J. Biol. Chem. **279,** 19948 (2004) ▪ Minocycline up-regulates BCL-2 levels in mitochondria and attenuates male germ cell apoptosis: M. Castanares, et al.; BBRC **337,** 663 (2005) ▪ Minocycline reduces proinflammatory cytokine expression, microglial activation, and caspase-3 activation in a rodent model of diabetic retinopathy: J.K. Krady, et al.; Diabetes **54,** 1559 (2005) ▪ Minocycline inhibits poly(ADP-ribose) polymerase-1 at nanomolar concentrations: C.C. Alano, et al.; PNAS **103,** 9685 (2006) ▪ Multiple neuroprotective mechanisms of minocycline in autoimmune CNS inflammation: K. Maier, et al.; Neurobiol. Dis. **25,** 514 (2007) ▪ Comparison of doxycycline and minocycline in the inhibition of VEGF-induced smooth muscle cell migration: J.S. Yao, et al.; Neurochem. Int. **50,** 524 (2007)

CAS: 13614-98-7
MI: **14:** 6202



Minocycline . HCl

Misakinolide A see Bistheonellide A

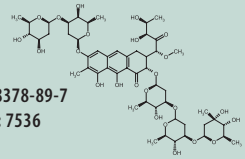
Mithramycin A

[Mithracin; Aureolic acid; Aurelic acid; Plicamycin]

ALX-380-097-M001 1 mg
ALX-380-097-M005 5 mg

Isolated from *Streptomyces argillaceus.* Antineoplastic and immunosuppressive antibiotic. Inhibits transcription and protein synthesis. Substrate of P-glycoprotein in multidrug resistant (MDR) cancer cells. Binds to DNA in native chromatin. DNA-binding fluorescent dye.

CAS: 18378-89-7
MI: **14:** 7536



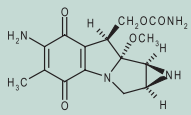
Mithramycin A

Mitomycin C

ALX-380-023-M005 5 mg
ALX-380-023-M010 10 mg

Isolated from *Streptomyces caespitosus.* Antitumor antibiotic. Inhibitor of DNA synthesis, nuclear division and cancer cells. DNA intercalating agent. Apoptosis inducer.

CAS: 50-07-7
MI: **14:** 6215



Mitomycin C

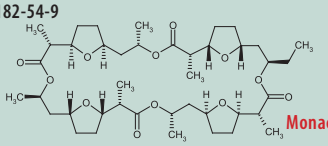
Monactin

[5-Demethyl-5-ethylnonactin; Antibiotic AKD 1B]

ALX-380-214-M001 1 mg

Isolated from *Streptomyces sp.* MST-AS5448. Ionophore antibiotic. Inhibits T cell proliferation induced by IL-2 and cytokine production at nanomolar levels for IL-2, IL-4, IL-5 and interferon-γ.

CAS: 7182-54-9



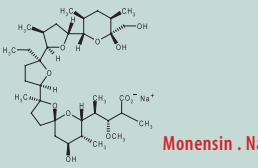
Monactin

Monensin . Na

ALX-380-026-M100 100 mg
ALX-380-026-G001 1 g

Antibiotic that functions as Na^+ ionophore. Blocks glycoprotein secretion. Inhibits proliferation of several lymphoma cell lines through cell cycle arrest and apoptosis.

CAS: 22373-78-0
MI: **14:** 6246



Monensin . Na

Moniliformin . Na

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

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

Isolated from *Fusarium moniliforme.* Mycotoxin. ***Technical Note Page 110.***

Monophosphoryl Lipid A see Lipid A (Monophosphoryl)-

Monorden see Radicicol

Morin

[2′,3,4′,5,7-Pentahydroxyflavone]

ALX-385-016-G001 1 g

Antioxidant flavonoid. Shows anti-proliferative and antitumor properties. Induces apoptosis. Induces cell cycle arrest at the G2/M phase. Anti-inflammatory compound. Suppresses NF-κB activation. Induces lipid peroxidation and DNA strand breaks.

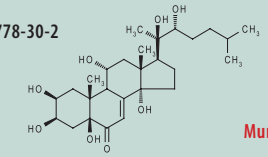
Motilide see EM574

Muristerone A

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

Ecdysteroid. Due to reduced availability we recommend the alternative use of Ponasterone A (Prod. No. ALX-370-014).

CAS: 38778-30-2



Muristerone A

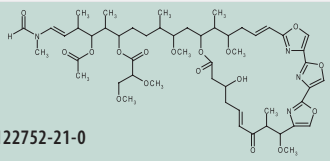
Technical Note Page 87

Mycalolide B

ALX-350-288-C100 100 µg

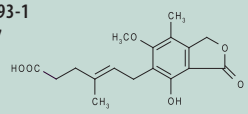
Isolated from the marine sponge *Mycale sp.* Inhibits actin polymerization with a different mechanism of action from cytochalasin D (Prod. No. ALX-380-031). Suppresses actin-activated myosin Mg^{2+}-ATPase activity. Depolymerizes F-actin by nibbling and forms a 1:1 complex with G-actin.

CAS: 122752-21-0



Mycalolide B

CAS: 24280-93-1
MI: **14:** 6327



Mycophenolic acid

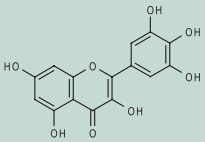
Mycophenolic acid

ALX-380-015-M050 50 mg
ALX-380-015-M250 250 mg
ALX-380-015-G001 1 g

Isolated from *Penicillium brevi-compactum*. Immunosuppressive agent that inhibits de novo purine nucleotide synthesis via inhibition of inosine-5′-monophosphate (IMP). Prevents the formation of xanthosine-5′-monophosphate (XMP) and guanosine-5′-monophosphate (GMP). Depletes tetrahydrobiopterin and decreases nitric oxide (NO) production by iNOS (NOS II) without affecting nNOS (NOS I) activity. Suppresses cytokine-induced nitric oxide (NO) production in mouse and rat vacuolar endothelial cells.

Mycotrienin see Ansatrienin

CAS: 529-44-2
MI: **14:** 6332



Myricetin

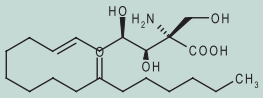
Technical Note Page 108

Myricetin [3,3′,4′,5,5′,7-Hexahydroxyflavone]

ALX-385-012-M010 10 mg
ALX-385-012-M050 50 mg

Antioxidant flavonoid. Has antitumor and chemopreventive properties. Anti-inflammatory. Inhibits NF-κB activation.

CAS: 35891-70-4



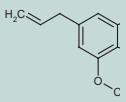
Myriocin

Myriocin [ISP-1; Thermozymocidin]

ALX-350-274-M005 5 mg

Potent immunosuppressant ~10 to 100-fold more potent than cyclosporin A (Prod. No. ALX-380-002). Blocks sphingolipid biosynthesis by inhibiting serine palmitoyltransferase (K_i=0.28nM). Induces apoptosis by depletion of cellular sphingolipids. Inhibits proliferation of an IL-2-dependent mouse cytotoxic cell line CTLL-1.

CAS: 607-91-0
MI: **14:** 6334



Myristicin

Technical Note Page 108

Myristicin

ALX-350-227-M100 100 mg

Isolated from *Petroselinium hortense Hoffmann*. Natural product isolated from parsley oil. Inducer of glutathione S-transferases. Also inhibits chemical carcinogenesis. Induces rat and human cytochrome P450 enzymes. Has very potent hepatoprotective activity. Induces apoptosis.

Myristicin, Dihydro- [Dihydromyristicin]

ALX-350-222-M100 100 mg

Hydrogenated product of myristicin (Prod. No. ALX-350-227), a natural constituent of parsley. Inducer of glutathione S-transferases. ***Technical Note Page 108.***

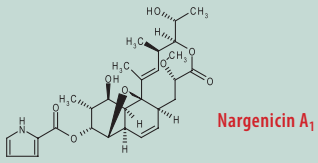
NADP . 2Na [β-Nicotinamide Adenine Dinucleotide Phosphate; β-NADP; Coenzyme II]

ALX-480-003-M050 50 mg
ALX-480-003-M250 250 mg
ALX-480-003-G001 1 g

NADPH . 4Na [β-Nicotinamide Adenine Dinucleotide Phosphate (reduced form); β-NADPH]

Bulk

ALX-480-004-M050 50 mg
ALX-480-004-M250 250 mg
ALX-480-004-G001 1 g



Nargenicin A_1

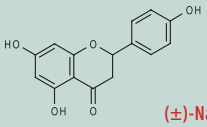
Naramycin A see Cycloheximide

Nargenicin A_1

ALX-380-096-M001 1 mg
ALX-380-096-M005 5 mg

Isolated from *Nocardia argentinensis*. Antibiotic against Gram-positive bacteria, particularly *Staphylococcus* and *Clostridia*. Effective against multi-resistant strains (penicilline, tetracycline, clindamycin, novobiocin, kanamycin, chloramphenicol, erythromycin). The power of effect is comparable to erythromycin.

CAS: 67604-48-2
MI: **14:** 6424



(±)-Naringenin

Technical Note Page 105

(±)-Naringenin [(±)-4′,5,7-Trihydroxyflavanone]

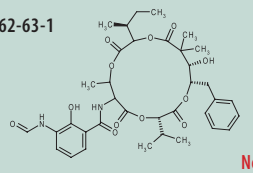
ALX-385-010-G001 1 g

Antioxidant flavonoid. Has anti-inflammatory and antitumor properties. Induces apoptosis. Stimulates DNA repair following oxidative damage. Inhibits the activity of phosphoinositide 3-kinase (PI(3)K).

Natural Yellow 18 see Berberine . hemisulfate

NDGA see Nordihydroguaiaretic acid

CAS: 22862-63-1



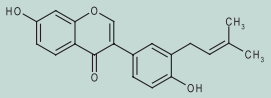
Neoantimycin

Neoantimycin

ALX-380-233-MC05 0.5 mg

Antibiotic. Isolated from *Streptomyces sp.* MST-AS4461. Displays potent nematocidal and antitumor activity.

CAS: 41060-15-5



Neobavaisoflavone

Neobavaisoflavone

ALX-350-146-M001 1 mg

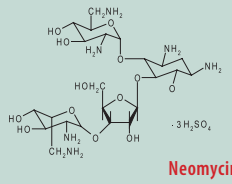
Isolated from plant *Psoralea corylifolia*. Inhibits platelet aggregation. DNA polymerase inhibitor. Shows antifungal activity.

Neomycin sulfate

ALX-380-035-G005 5 g
ALX-380-035-G010 10 g
ALX-380-035-G025 25 g

Aminoglycoside antibiotic that inhibits translation by binding to the small subunit of prokaryotic ribosomes. Inhibitor of phospholipase C (PLC) due to binding to inositol phospholipids. Neomycin inhibits phosphatidylcholine-phospholipase D activity. Blocks voltage sensitive Ca^{2+} channels without affecting Na^{+}/Ca^{2+} antiporters in nerve cells.

CAS: 1405-10-3
MI: **14:** 6454



Neomycin sulfate

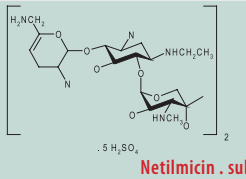
Neonicotine see Anabasine . HCl

Netilmicin . sulfate

ALX-380-048-M001 1 mg
ALX-380-048-M005 5 mg

Semisynthetic aminoglycoside antibiotic derived from sisomicin. Active against most Gram-negative and some Gram-positive bacteria, including certain strains resistant to gentamicin. In terms of bacteriological efficacy, netilmicin is comparable to gentamicin (Prod. No. ALX-380-003), amikacin (Prod. No. ALX-380-045) and tobramycin (Prod. No. ALX-380-018).

CAS: 56391-57-2
MI: **14:** 6479



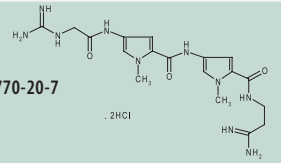
Netilmicin . sulfate

Netropsin . 2HCl

ALX-380-088-M005 5 mg

Isolated from *Streptomyces netropsis*. Nucleic acid binding ligand. Binds to A-T-rich regions of the minor groove of DNA.

CAS: 63770-20-7



Netropsin . 2HCl

Niacin see Nicotinic acid

Niacinamide see Nicotinamide

Nicotinamide

[Niacinamide; 3-Pyridinecarboxylic amide; Vitamin PP]

ALX-460-008-G010 10 g

β-Nicotinamide Adenine Dinucleotide Phosphate see NADP

β-Nicotinamide Adenine Dinucleotide Phosphate (reduced form) see NADPH

Nicotinic acid

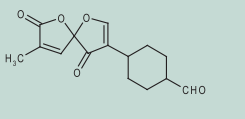
[Niacin; 3-Pyridinecarboxylic acid; Vitamin B]

ALX-460-009-G010 10 g

Nidulal

ALX-350-110-MC05 0.5 mg

Isolated from *Nidula candida*. Induces differentiation of human promyelocytic leukemia cells. In COS-7 cells selectively activates AP-1 dependent signal transduction in a manner similar to TPA/PMA (Prod. No. ALX-445-004).



Nidulal

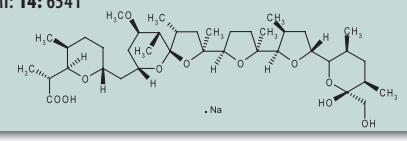
Nigericin . Na

[Antibiotic K 178]

ALX-380-050-M005 5 mg
ALX-380-050-M025 25 mg

Isolated from *Streptomyces hygroscopicus*. Acts as an H^{+}, K^{+}, Pb^{2+} ionophore. Is most commonly an antiporter of H^{+} and K^{+}. Inhibits the Golgi functions.

CAS: 28380-24-1
MI: **14:** 6541



Nigericin . Na

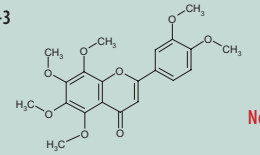
Nobiletin

[3′,4′,5,6,7,8-Hexamethoxyflavone; NSC 76751]

ALX-385-026-M010 10 mg

Antioxidant and anti-inflammatory. Inhibits the phosphorylation of mitogen-activated protein kinase MEK. Suppresses the expression of matrix metalloproteinases (MMP) 1, 3 and 9, that are involved in the breakdown of the extracellular matrix during tumor metastasis. Suppresses NF-κB transcriptional activation, nitric oxide (NO) and PGE2 production, inducible nitric oxide (iNOS; NOS II) and cyclooxygenase-2 (COX-2) expression in LPS-activated RAW cells.

CAS: 478-01-3



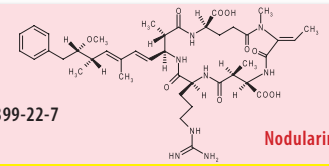
Nobiletin

Nodularin

ALX-350-061-C050 50 µg
ALX-350-061-C100 100 µg
ALX-350-061-C250 250 µg
ALX-350-061-M001 1 mg

Isolated from *Nodularia spumigena*. Inhibitor of protein phosphatase 1 (PP1) (IC_{50}=1.8nM), protein phosphatase 2A (PP2A) (IC_{50}=0.026nM) and to a lesser extent protein phosphatase 2B (PP2B) (IC_{50}=8.7µm). Similar to microcystin-LR (Prod. No. ALX-350-012) but with increased water solubility. Genotoxic. Induces oxidative DNA damage by oxidation of purines. Induces apoptosis in HepG2 cells. Carcinogenic.

CAS: 118399-22-7



Nodularin

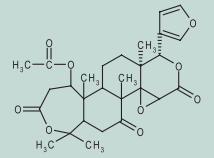
Technical Note Page 90

Nomilin

ALX-350-228-M025 25 mg

Isolated from grapefruit seed and citrus juice. Induces phase II detoxifying enzymes and inhibits chemically induced carcinogenesis. Exhibits immunomodulatory activity and also inhibits HIV-1 replication. Does not possess any inherent antioxidant capacity.

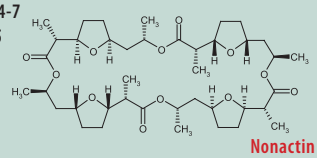
CAS: 1063-77-0
MI: **14:** 6674



Nomilin

Technical Note Page 105

CAS: 6833-84-7
MI: **14:** 6675



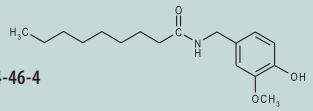
Nonactin

Nonactin [Polynactin; Werramycin A]

ALX-450-008-M005 5 mg
ALX-450-008-M025 25 mg

Antibiotic. Isolated from *Streptomyces griseus.* Macrotetrolide antibiotic. Monovalent cation ionophore with high selectivity for ammonium and potassium. Specifically inhibits the processing of cytoplasmic precursor proteins destined for the mitochondria. Inhibits the effects on P170 glycoprotein-mediated efflux of chemotherapeutic agents in multidrug resistant (MDR) cancer cells.

CAS: 2444-46-4



Nonivamide

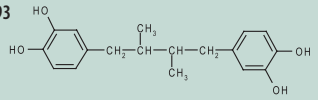
Nonivamide [Nonylic vanillylamide; N-Vanillylnonamide; Pseudocapsaicin]

ALX-550-239-M025 25 mg
ALX-550-239-M100 100 mg

Synthetic. Minor constituent of hot pepper *(Capsicum oleoresin).*

LIT: Comparison of nonivamide and capsaicin with regard to their pharmacokinetics and effects on sensory neurons: G. Skofitsch, et al.; Arzneimittel-Forschung **34,** 154 (1984) ▪ The effects of a series of capsaicin analogues on nociception and body temperature in the rat: A.G. Hayes, et al.; Life Sci. **34,** 1241 (1984) ▪ Hypotensive and antinociceptive effect of ether-linked and relatively non-pungent analogues of N-nonanoyl vanillylamide: J. Chen, et al.; Eur. J. Med. Chem. **27,** 187 (1992) ▪ A possible role of nitric oxide formation in the vasodilatation of rabbit ear artery induced by a topically applied Capsaicin analogue: T. Suzuki, et al.; J. Vet. Med. Sci. **60,** 691 (1998)

CAS: 500-38-9
MI: **14:** 6693



Nordihydroguaiaretic acid

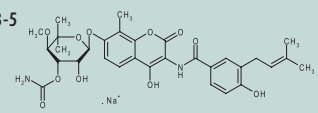
Nordihydroguaiaretic acid [NDGA]

ALX-350-086-G001 1 g

Synthetic. Antioxidant and antineoplastic. Lipoxygenase inhibitor. Stimulates the rapid retrograde movement of both Golgi stacks and the trans-Golgi network to the endoplasmatic reticulum (ER). Displays pleiotropic effects on cells, which include apoptosis, cell proliferation, differentiation and chemotaxis. Anticancer agent.

Nourseothricin . sulfate see **Streptothricin Antibiotic**

CAS: 1476-53-5
MI: **14:** 6722



Novobiocin . Na

Technical Note Page 98

Novobiocin . Na [Albamycin; Streptonivicin]

ALX-380-093-G001 1 g

Antibiotic. Inhibitor of HSP90. Interacts with the C-terminal ATP-binding domain of HSP90 in contrast to the benzoquinone ansamycins 17-AAG (Prod. No. ALX-380-091), geldanamycin (Prod. No. ALX-380-054), herbimycin A (Prod. No. ALX-350-029), and the chemically unrelated radicicol (Prod. No. ALX-380-092), which bind to the N-terminal ATP-binding site of HSP90. Inhibitor of DNA gyrase. Useful for the production of positively supercoiled plasma DNA, targeting the nucleotide-binding site of gyrase B. Inhibits retrovirus RNA-dependent DNA polymerase. Potent inhibitor of ADP ribosylation. Inhibits LPS-induced production of pro-inflammatory cytokines, such as TNF-α, IL-1, IL-6 and IL-10. Inhibits protein synthesis and alters the phosphorylation state of several cytosolic proteins. Reverses etoposide resistance in non-P-glycoprotein expressing multidrug resistant tumor cell lines. Inducer of CD38 on cells of the myelomonocytic lineage. Forms ion channels in lipid bilayers (MDR).

NSC 76751 see **Nobiletin**

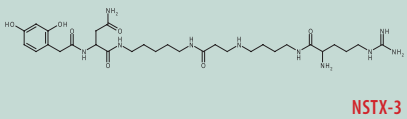
NSC 306951 see **Avarol**

NSC 357683 see **Echnosporin**

NSC 407296 see **Chlorogenic acid**

NSC 655649 see **Becatecarin**

NSC 707545 see **17-DMAG**



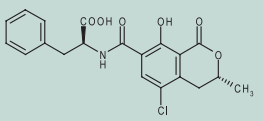
NSTX-3

NSTX-3 [2,4-Dihydroxyphenylacetyl-L-asparaginyl-N'-(L-arginyl-puteanyl)-cadaverine]

ALX-630-087-C100 100 µg

Synthetic. Originally isolated from *Nephila maculata.* Specific, irreversible spider neurotoxin, that inhibits both glutamate and postsynaptic potentials in the neuromuscular junction. Specifically blocks Na^+-channels.

CAS: 303-47-9
MI: **14:** 6740



Ochratoxin A

Technical Note Page 110

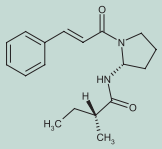
Ochratoxin A

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. Immunosuppressive, genotoxic, teratogenic and carcinogenic. Stimulates lipid peroxidation. Induces oxidative DNA lesions coupled with direct DNA adducts via quinone formation.

n-Octylcaffeate see **Caffeic acid n-octyl ester**

CAS: 72755-20-5



Odorine

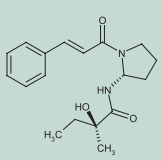
Odorine

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) ▪ Diamide derivatives and cycloartanes from the leaves of Aglaia elliptica: A. Inada, et al.; Chem. Pharm. Bull. (Tokyo) **49,** 1226 (2001)

CAS: 72755-22-7



Odorinol

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.

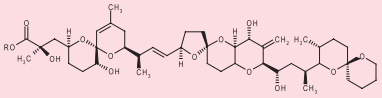
LIT: Cancer chemopreventive activity of odorine and odorinol from Aglaia odorata: A. Inada, et al.; Biol. Pharm. Bull. **24,** 1282 (2001)

The Okadaic Acid Source™

Okadaic acid (high purity)

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

Isolated from *Prorocentrum concavum*. Potent inhibitor of protein phosphatases 1 (PP1) and 2A (PP2A) in numerous cell types. Does not affect activity of acid phosphatase, alkaline phosphatase and tyrosine phosphatase. 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. Tumor promoter. Has shown contractile effect on smooth muscle and heart muscle. Significantly increases cyclin B1 expression in adult neurons.



Okadaic acid

Okadaic acid . NH_4 (high purity)]

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

For technical information see product Okadaic acid (high purity) (Prod. No. ALX-350-003).

Okadaic acid . K (high purity)

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

For technical information see product Okadaic acid (high purity) (Prod. No. ALX-350-003).

Okadaic acid . Na (high purity)

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

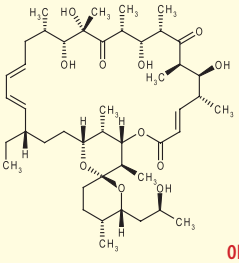
For technical information see product Okadaic acid (high purity) (Prod. No. ALX-350-003).

Oleandomycin triacetate ester see Troleandomycin

Oligomycin

ALX-380-037-M005	5 mg
ALX-380-037-M010	10 mg

Isolated from *Streptomyces diastatochromogens*. Macrolide antibiotic that inhibits membrane bound mitochondrial ATPase (F1), preventing phosphoryl group transfer. Induces apoptosis.

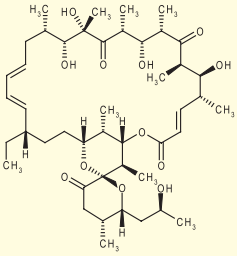


Oligomycin A

Oligomycin A

ALX-380-036-M005	5 mg

Isolated from *Streptomyces sp.* MST-AS5339. Major component of the oligomycin complex. Macrolide antibiotic that inhibits membrane bound mitochondrial ATPase (F1F0), preventing phosphoryl group transfer. Induces apoptosis. Induces autophagy in the IPLB-LdFB insect cell line.

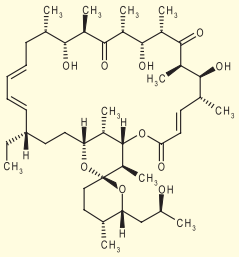


Oligomycin B

Oligomycin B [28-Oxooligomycin A]

ALX-380-038-M005	5 mg

Isolated from *Streptomyces sp.* MST-AS5339. Minor component of the oligomycin complex. Macrolide antibiotic that inhibits membrane bound mitochondrial ATPase (F1F0), preventing phosphoryl group transfer. Induces apoptosis.



Oligomycin C

Oligomycin C [12-Deoxyoligomycin A]

ALX-380-039-M001	1 mg

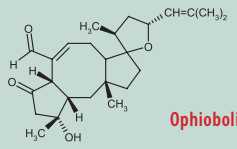
Isolated from *Streptomyces sp.* MST-AS5339. Minor component of the oligomycin complex. Macrolide antibiotic that inhibits membrane bound mitochondrial ATPase (F1F0), preventing phosphoryl group transfer. Induces apoptosis.

Ophiobolin A [Cochliobolin A; Ophiobalin]

ALX-270-109-MC01	0.1 mg
ALX-270-109-M001	1 mg

Isolated from *Bipolaris leersia* MST-FP107. Cell permeable antagonist of calmodulin. Inhibits Ca^{2+}/calmodulin-dependent phosphodiesterase. Inhibits P-glycoprotein-mediated transport. Exhibits antibacterial, antitumor and nematocidal activities. Phytotoxic.

CAS: 4611-05-6



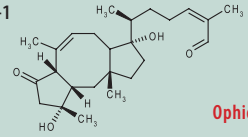
Ophiobolin A

Ophiobolin B [Cochliobolin B; Zizanin B; Ophiobolsin A]

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.

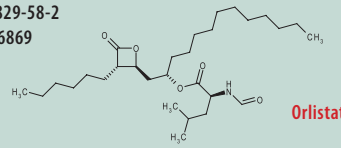
CAS: 5601-74-1



Ophiobolin B

ALEXIS® BIOCHEMICALS

CAS: 96829-58-2
MI: **14:** 6869



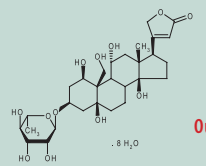
Orlistat

Orlistat [Tetrahydrolipstatin] Bulk

ALX-350-152-M050 50 mg
ALX-350-152-M250 250 mg

Synthetic. Originally isolated from *Streptomyces sp.* Cell permeable, irreversible inhibitor of gastric and pancreatic lipases. Shows only minimal activity against amylase, trypsin, chymotrypsin, or phospholipase A2 (PLA2). Partially inhibits the hydrolysis of triglycerides and lowers the absorption of dietary fat and promotes weight loss. Anti-obesity drug. Exhibits antitumor activity by inhibition of the thioesterase domain of fatty acid synthase (FAS) both *in vitro* and *in vivo.*

CAS: 630-60-4
MI: **14:** 6901



Ouabain . $8H_2O$

Ouabain . $8H_2O$ [Strophanthin G]

ALX-350-066-M100 100 mg

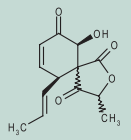
Selective inhibitor of Na^+- and K^+-dependent ATPases.

Oxaspirodion

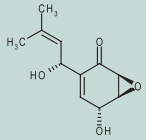
ALX-350-301-MC05 0.5 mg

Isolated from *Chaetomium subspirale.* Mixture of 4 non-separable isomers. Inhibits TNF-α expression (IC_{50}=2.5µg/ml). Exhibits no antibacterial and antifungal activities up to 100µg/disk in the standard disk assay. Weak cytotoxic properties against tumor cells. Inhibition of the TNF-α promoter activity is caused by an inhibition of the phosphorylation of the ERK1/2 kinases. In addition, oxaspirodion inhibits the activation of the transcription factor NF-κB, which is involved in the inducible expression of many proinflammatory genes.

LIT: Inhibition of inducible TNF-alpha expression by oxaspirodion, a novel spiro-compound from the ascomycete Chaetomium subspirale: J. Rether, et al.; Biol. Chem. **385,** 829 (2004) ▪ Oxaspirodion, a new inhibitor of inducible TNF-alpha expression from the Ascomycete chaetomium subspirale. Production, isolation and structure elucidation: J. Rether, et al.; J. Antibiot. (Tokyo) **57,** 493 (2004)



Oxaspirodion



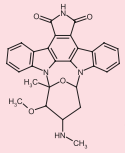
Panepoxydone

20-Oxo-20-deoxyphorbol 12,13-dibutyrate

ALX-445-020-M001 1 mg
ALX-445-020-M005 5 mg

Used to prepare [^{3}H]-PDBu.

CAS: 141196-69-2



7-Oxostaurosporine

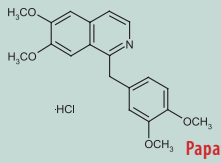
Technical Note Page 100

7-Oxostaurosporine [Antibiotic BMY 41950; Antibiotic RK 1409; LCM76-L]

ALX-380-210-M001 1 mg

Antibiotic. Isolated from *Streptomyces sp.* MST-AS5345. Potent inhibitor of protein kinase C (PKC). Inhibits the cell cycle at the G2 stage.

CAS: 61-25-6
MI: **14:** 7019



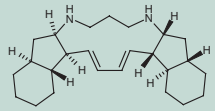
Papaverine . HCl

Paclitaxel [Taxol®] Bulk

ALX-351-001-M001 1 mg
ALX-351-001-M005 5 mg
ALX-351-001-M025 25 mg

Isolated from *Taxus brevifolia.* Antitumor agent. Binds to tubulin. Promotes assembly and inhibits disassembly of microtubules. Blocks the cell cycle at the mitotic phase and induces apoptosis. The checkpoint of mitotic spindle assembly, aberrant activation of cyclin-dependent kinases, and the c-Jun N-terminal kinase/stress-activated protein kinase (JNK/SAPK) are involved in paclitaxel-induced apoptosis.

CAS: 112455-84-2



Papuamine

Panepoxydone

ALX-350-109-MC05 0.5 mg

Antibiotic. Isolated from *Lentinus crinitus.* Inhibitor of NF-κB activation by preventing the phosphorylation of IκB protein and thereby interrupts the signalling pathway. Strongly inhibits the expression of several NF-κB dependent pro-inflammatory genes.

D-(+)-Pantothenic acid hemicalcium salt see Calcium D-(+)-pantothenate

Papaverine . HCl

ALX-270-110-G005 5 g

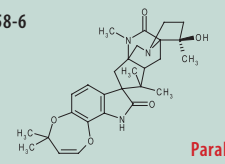
Originally isolated from opium. Alkaloid with smooth muscle relaxing activity. Inhibits phosphodiesterases.

Papuamine [(-)-Papuamin]

ALX-350-348-M001 1 mg

Isolated from sponge *Haliclona sp.* C_2-symmetrical pentacyclic alkaloid with antifungal and antimycobacterial activity.

CAS: 77392-58-6



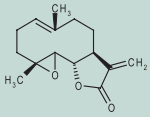
Paraherquamide A

Paraherquamide A [VM 29919]

ALX-380-215-M001 1 mg

Antibiotic. Isolated from *Penicillium simplicissimum* MST-FP116A. Selective and competitive cholinergic antagonist that distinguishes subtypes of cholinergic receptors. Anti-helmintic.

CAS: 20554-84-1
MI: **14:** 7048



Parthenolide

Parthenolide

ALX-350-258-M005 5 mg
ALX-350-258-M025 25 mg

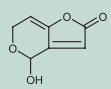
Isolated from Feverfew leaves. Sesquiterpene lactone. Anti-inflammatory compound. Specifically inhibits activation of NF-κB by preventing the degradation of IκBα and IκBβ. Also inhibits activation of MAP kinase (MAPK/ERK) and generation of leukotriene B4 and thromboxane B2. Potent anticancer agent. Induces apoptosis in various cancer cell lines. Specifically inhibits histone deacetylase 1 (HDAC1) without affecting other class I/II HDACs. Inhibits tubulin carboxypeptidase (TCP) activity.

Patulin

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. Known contaminant of spoiled apples.

CAS: 149-29-1
MI: **14:** 7053



Patulin

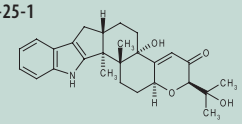
Technical Note Page 110

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. Inhibitor of the cerebellar inositol 1,4, 5-trisphophate (InsP(3)) receptor.

CAS: 57186-25-1



Paxilline

Technical Note Page 110

PD 114, 721 see **Kazusamycin A**

PD 124, 895 see **Kazusamycin B**

PDDHV

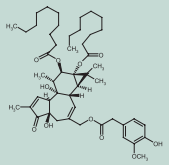
[Phorbol 12,13-didecanoate 20-homovanillate]

ALX-550-371-M001 1 mg
ALX-550-371-M005 5 mg

Resiniferatoxin-type phorboid vanilloid with capsaicin-like selectivity for TRPV1.

LIT: Resiniferatoxin-type phorboid vanilloids display capsaicin-like selectivity at native vanilloid receptors on rat DRG neurons and at the cloned vanilloid receptor VR1: A. Szallasi, et al.; Br. J. Pharmacol. **128,** 428 (1999)

CAS: 179469-40-0



PDDHV

PDNHV

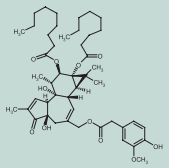
[Phorbol 12,13-dinonanoate 20-homovanillate]

ALX-550-372-M001 1 mg
ALX-550-372-M005 5 mg

Resiniferatoxin-type phorboid vanilloid with capsaicin-like selectivity for TRPV1.

LIT: Resiniferatoxin-type phorboid vanilloids display capsaicin-like selectivity at native vanilloid receptors on rat DRG neurons and at the cloned vanilloid receptor VR1: A. Szallasi, et al.; Br. J. Pharmacol. **128,** 428 (1999) ▪ Phorboid 20-homovanillates induce apoptosis through a VR1-independent mechanism: A. Macho, et al.; Chem. Biol. **7,** 483 (2000) ▪ Molecular cloning, functional characterization of the porcine transient receptor potential V1 (pTRPV1) and pharmacological comparison with endogenous pTRPV1: T. Ohta, et al.; Biochem. Pharmacol. **71,** 173 (2005)

CAS: 251362-87-5



PDNHV

Also available PPAHV – see page 66

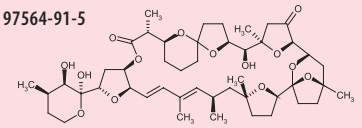
Pectenotoxin-2

[4,3-Dioxypectenotoxin; PTX-2]

ALX-350-369-C005 5 µg

Isolated from *Dinophysis acuta*. Potent disruptor of actin cytoskeleton in living cells. Forms 1:1 complexes with monomeric actin and caps actin filaments. Selective cytotoxic agent against several human cancer cell lines. Hepatotoxic.

CAS: 97564-91-5



Pectenotoxin-2

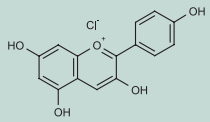
Pelargonidin chloride

[3,4′,5,7-Tetrahydroxyflavylium chloride]

ALX-385-014-M005 5 mg

Antioxidant flavonoid. Nitric oxide scavenger.

CAS: 134-04-3
MI: **14:** 7071

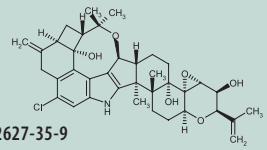


Pelargonidin chloride

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.



CAS: 12627-35-9

Penitrem A

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2′,3,4′,5,7-Pentahydroxyflavone see **Morin**

3,3′,4′,5,7-Pentahydroxyflavone see **Quercetin . $2H_2O$**

3,3′,4′,5,7-Pentahydroxyflavonone see **Taxifolin**

3,3′,4′,5,7-Pentahydroxyflavone-3-rutinoside see **Rutin**

3,3′,4′,5,7-Pentahydroxy-flavylium chloride see **Cyanidin chloride**

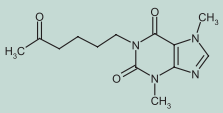
Pentoxifylline

[Trental]

ALX-270-112-G001 1 g
ALX-270-112-G005 5 g

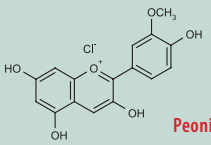
Isolated from *Penicillium expansum*. Phosphodiesterase inhibitor. Blocks the synthesis of TNF-α. Improves blood flow by decreasing blood viscosity.

CAS: 6493-05-6
MI: **14:** 7136



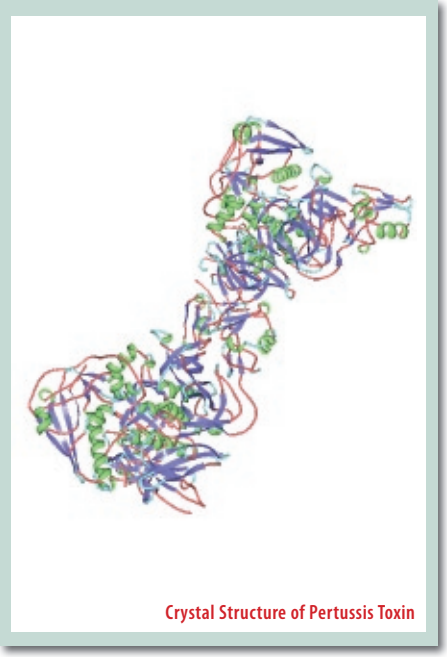
Pentoxifylline

CAS: 134-01-0
MI: **14:** 7143



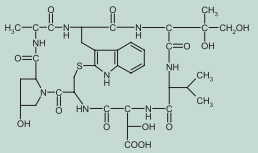
Peonidin chloride

Technical Note Page 108

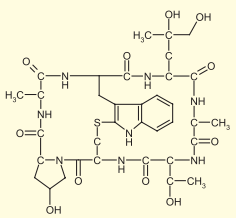


Crystal Structure of Pertussis Toxin

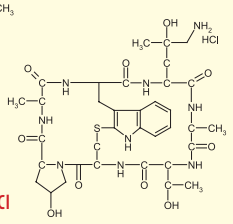
CAS: 26645-35-2



Phallacidin

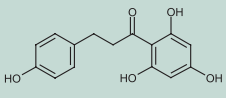


Phalloidin



Phalloidin, Amino-, . HCl

CAS: 60-82-2
MI: **14:** 7326



Phloretin

Technical Note Page 103

Peonidin chloride

[3,4′,5,7-Tetrahydroxy-3′-methoxyflavylium chloride]

ALX-385-015-M005 5 mg

Antioxidant flavonoid. Shows anti-inflammatory and chemopreventive properties.

Pertussis Toxin

[Islet-Activating Protein; PTX; Holotoxin]

ALX-630-003-C050 50 µg

Isolated from *Bordetella pertussis*. The purified protein consists of five dissimilar subunits: S-1 (MW 28kDa), S-2 (MW 23kDa), S-3 (MW 22kDa), S-4 (MW 11.7kDa) and S-5 (MW 9.3kDa), in a molar ratio of 1:1:1:2:1. S-1 (A protomer) is responsible for the enzymatic activity of the toxin. Together, S-2, S-3, S-4 and S-5 comprise the B oligomer, responsible for binding the toxin to the cell surface.

Pertussis Toxin A Protomer

[PTX A Protomer ; Islet-Activating Protein A Protomer]

ALX-630-080-C010 10 µg

Isolated from *Bordetella pertussis*. The A protomer (S-1) of pertussis toxin possesses both NAD^+ glycohydrolase and ADP-ribosyltransferase activities, but is unable to penetrate cells in the absence of B oligomer. It is, however, as effective as native pertussis toxin in catalyzing ADP-ribosylation in broken cell preparations.

Pertussis Toxin B Oligomer

[PTX B Oligomer; Islet-Activating Protein B Oligomer]

ALX-630-081-C040 40 µg

Isolated from *Bordetella pertussis*. Increases cytosolic Ca^{2+} levels and stimulates platelet aggregation. Activates phospholipase C (PLC). The B oligomer is a subunit of pertussis toxin responsible for binding of the holotoxin to eukaryotic cell surfaces, facilitating entry of the A promoter into receptive cells. Lacks intrinsic ADP-ribosyltransferase activity but still induces several responses in sensitive cells, e.g. human T cell mitogenesis, human platelet aggregation and insulin-like action in rat adipocytes.

Phallacidin

ALX-350-269-M001 1 mg

Isolated from *Amanita phalloides* mushrooms. Biological activity like phalloidin (Prod. No. ALX-350-265), but contains a carboxy group for coupling reactions.

Phalloidin

ALX-350-265-M001 1 mg

Isolated from *Amanita phalloides* mushrooms. Binds to polymeric actin with high affinity. Stabilizes filaments and decreases concentration of monomeric actin.

Phalloidin (Biotin)

ALX-350-267-MC01 0.1 mg

Semisynthetic from aminomethyldithiolano-phalloidin. Binds actin filaments and streptavidin simultaneously, due to the long spacer between the two active components.

LIT: Preparation of tetramethylrhodaminyl-phalloidin and uptake of the toxin into short-term cultured hepatocytes by endocytosis: H. Faulstich, et al.; Exp. Cell Res. **144,** 73 (1983) ▪ Biotinylphallotoxins: preparation and use as actin probes: H. Faulstich, et al.; J. Histochem. Cytochem. **37,** 1035 (1989)

Phalloidin (FITC)

[Fluoresceinyl-aminomethyldithiolano-phalloidin]

ALX-350-268-MC01 0.1 mg

Semisynthetic from aminomethyldithiolano-phalloidin. For detection of microfilaments in the light microscope. Mixture of 4 isomers with lower affinity to actin than phalloidin (Prod. No. ALX-350-265).

Phalloidin, Amino- . HCl

[Amino-phalloidin]

ALX-350-266-M001 1 mg

Semisynthetic from phalloidin. Biological activity like phalloidin (Prod. No. ALX-350-265), but contains a functional amino group for coupling reactions.

Phenethyl caffeate see Caffeic acid phenylethyl ester

Phloretin

ALX-270-113-M100 100 mg

Flavonoid. Protein kinase C (PKC) inhibitor. PGF2α receptor antagonist. In astrocytes, these receptors are linked to phospholipase C, thus affecting phosphoinositide hydrolysis and intracellular Ca^{2+} levels. Inhibits myo-inositol uptake and 5′-iodothyronine deiodinase. Prevents TNF-α stimulated upregulation of VCAM-1, ICAM-1 and E-selectin. Enhances adiponectin expression.

Phomin see Cytochalasin B

The PMA/TPA Source™

Phorbol 12,13-diacetate [PDA]

ALX-445-003-M001 1 mg
ALX-445-003-M005 5 mg

Less potent than phorbol 12,13-dibutyrate (PDBu) (Prod. No. ALX-445-001), but also less hydrophobic.

Phorbol 12,13-dibutyrate [PDBu]

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

Widely used protein kinase C (PKC) activator. Less potent than phorbol 12-myristate 13-acetate (PMA; TPA) (Prod. No. ALX-445-004), but also less hydrophobic.

4α-Phorbol 12,13-dibutyrate [4α-PDBu]

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

Negative control for phorbol 12, 13-dibutyrate (PDBu) (Prod. No. ALX-445-001).

Phorbol 12,13-didecanoate [PDD]

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

Very potent and hydrophobic protein kinase C (PKC) activator.

4α-Phorbol 12,13-didecanoate [4α-PDD]

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

Activator of TRPV4. Negative control for phorbol 12,13-didecanoate (PDD) (Prod. No. ALX-445-002).

LIT: Activation of TRPV4 channels (hVRL-2/mTRP12) by phorbol derivatives: H. Watanabe, et al.; J. Biol. Chem. **277,** 13569 (2002) ▪ TRPV4 calcium entry channel: a paradigm for gating diversity: B. Nilius, et al.; Am. J. Physiol. Cell Physiol. **286,** C195 (2004)

Phorbol 12,13-didecanoate 20-homovanillate see PDDHV

Phorbol 12,13-dinonanoate 20-homovanillate see PDNHV

Phorbol 12-N-methylanthranilate see Sapintoxin D

Phorbol 12-myristate 13-acetate [PMA; 12-O-Tetradecanoylphorbol 13-acetate; TPA]

Bulk

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). Causes 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.

4α-Phorbol 12-myristate 13-acetate

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

Negative control for phorbol 12-myristate 13-acetate (PMA; TPA) (Prod. No. ALX-445-004).

Phorbol 12-phenylacetate 13-acetate 20-homovanillate see PPAHV

Phorbol 13-acetate

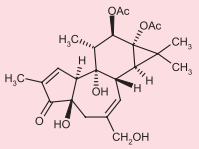
ALX-445-028-M001 1 mg
ALX-445-028-M005 5 mg

Reference compound for studying 12-deacylation of phorbol 12-myristate 13-acetate (PMA; TPA).

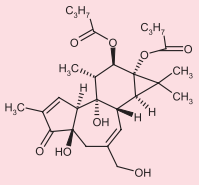
Phorbol 13-myristate

ALX-445-044-M001 1 mg
ALX-445-044-M005 5 mg

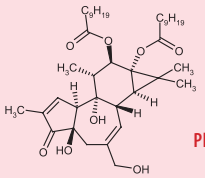
Phosphotrienin see Fostriecin



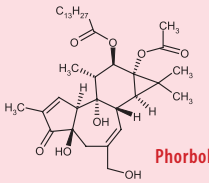
Phorbol 12,13-diacetate



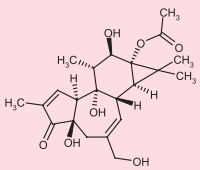
Phorbol 12,13-dibutyrate



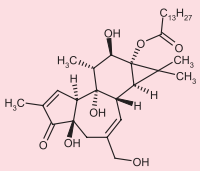
Phorbol 12,13-didecanoate



Phorbol 12-myristate 13-acetate



Phorbol 13-acetate



Phorbol 13-myristate

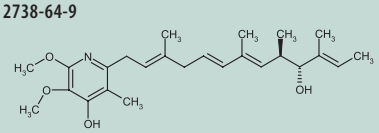
Piericidin A [Piericidin A1; Shaoguanmycin B; Antibiotic MT 1882-I; Antibiotic SN 198E; Antibiotic IT 143D]

ALX-380-235-M002 2 mg

Antibiotic. Isolated from *Streptomyces sp.* MST-AS5364. Specific and potent inhibitor of NADH-ubiquinone oxidoreductase (complex I) that binds to ubiquinone binding site(s). Inhibits both mitochondrial and bacterial NADH ubiquinone oxidoreductase. Anticancer agent that prevents up-regulation of GRP78, and exhibits cytotoxic activity for etoposide resistant cancer cells under glucose-deprived conditions.

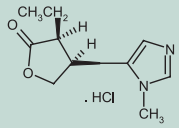
Piceatannol see Latest Additions

CAS: 2738-64-9



Piericidin A

CAS: 54-71-7
MI: **14:** 7424



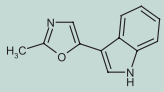
(+)-Pilocarpine . HCl

(+)-Pilocarpine . HCl

ALX-550-092-G001 1 g

Cholinergic agonist.

CAS: 13640-26-1



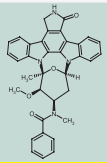
Pimprinine

Pimprinine [5-(3-Indolyl)-2-methyloxazole; Antibiotic WS 30581C; Antibiotic APHE 3]

ALX-380-234-M001 1 mg

Antibiotic. Isolated from *Streptomyces sp.* MST-AS5360. Potent inhibitor of monoamine oxidase. Has antiepileptic affects. Inhibits platelet aggregation.

CAS: 120685-11-2
MI: **14:** 6185



PKC412

Technical Note Page 100

PKC412 [4'-N-Benzoyl-staurosporine; Midostaurin; CGP 41251]

ALX-380-281-M001 1 mg
ALX-380-281-M005 5 mg

Semisynthetic from staurosporine (a fermentation product of *Streptomyces staurosporeus*) (Prod. No. ALX-380-014). Inhibitor of a variety of serine/threonine and tyrosine kinases, like protein kinase C (PKC), cyclic AMP-dependent protein kinase (PKA), S6 kinase, Akt (protein kinase B; PKB) and epidermal growth factor receptor (EGFR) tyrosine kinase activity. Potently inhibits FLT-3 kinase *in vitro* and *in vivo*. Apoptosis inducer. Showed broad antiproliferative activity against various tumor cell lines. Selectively inhibits T lymphocyte production of TNF-α. Upregulates endothelial nitric oxide synthase (eNOS / NOSIII).

PMA see Phorbol 12-myristate 13-acetate

Podophyllotoxin

ALX-630-086-M100 100 mg

Isolated from *Podophyllum peltatum.* Potent inhibitor of microtubule assembly. Antineoplastic glucoside. Antitumor agent. DNA topoisomerase II ihibitor.

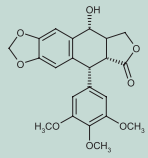
Ponkanetin see Tangeretin

Polydatin [Resveratrol-3β-mono-D-glucoside]

ALX-350-114-M010 10 mg

Isolated from *Polygonum cuspidatum.* Platelet aggregation inhibitor. Shows multiple effects on vacuolar smooth muscle cells, myocardial cells, endothelial cells and white blood cells after shock. May inhibit phospholipase A2 (PLA2). Inhibits the expression of various cell adhesion molecules.

CAS: 518-28-5
MI: **14:** 7546



Podophyllotoxin

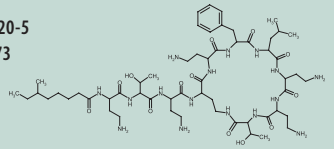
Polymyxin B . sulfate

ALX-380-040-G001 1 g
ALX-380-040-G005 5 g

Antibiotic. Isolated from *Bacillus polymyxa.* Inhibitor of protein kinase C (PKC). Breaks the bacterial membrane by incorporating into the phospholipid of the outer membrane and activating phospholipase.

Polymyxin E . sulfate see Colistin . sulfate

CAS: 1405-20-5
MI: **14:** 7573



Polymyxin B . sulfate

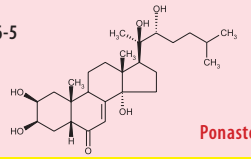
Ponasterone A [25-Deoxy-20-hydroxyecdysone; 25-Deoxyecdysterone]

Bulk

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

Synthetic. A member of the ecdysteroid family. Analog of ecdysone (Prod. No. ALX-370-011) with similar properties to muristerone A (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 ponasterone A was able to induce expression of β-galactosidase to levels similar to those obtained with muristerone A induction.

CAS: 13408-56-5
MI: **14:** 7588



Ponasterone A

Technical Note Page 87

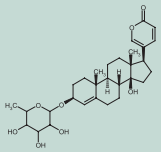
PPAHV [Phorbol 12-phenylacetate 13-acetate 20-homovanillate]

ALX-550-355-M001 1 mg
ALX-550-355-M005 5 mg

Non-pungent resiniferatoxin-type phorboid vanilloid. Agonist at rat TRPV1 (EC_{50} between 3 and 10μM) but virtually inactive at human TRPV1 (EC_{50}>10μM). Induces apoptosis through a TRPV-independent mechanism.

8-Prenylnaringenin see 8-Isopentenylnaringenin

CAS: 466-06-8



Proscillaridin A

Technical Note Page 97

Proscillaridin A

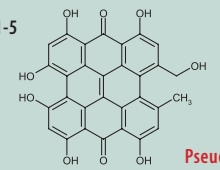
ALX-350-285-M005 5 mg

Cardiac glycoside. Specific Na^+/K^+-ATPase inhibitor. Shows high cytotoxicity in tumor cells. Very potent immunosuppressor. DNA topoisomerase I & II inhibitor.

Prostratin see 12-Deoxyphorbol 13-acetate

Pseudocapsaicin see Nonivamide

CAS: 55954-61-5



Pseudohypericin

Pseudohypericin

ALX-350-276-M001 1 mg
ALX-350-276-M005 5 mg

Isolated from *Hypericum perforatum.* Inhibitor of protein kinase C (PKC) (IC_{50}=15μg/ml). Antiviral and antiretroviral activity. Potent inhibitor of dopamine-β-hydrolase (IC_{50}=3μg/ml).

Pseudolaric acid B

[Pseudolarix acid B; PLAB, PAB]

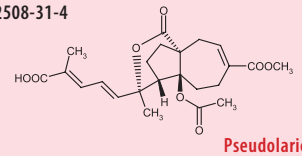
Bulk

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

Isolated from *Pseudolarix kaempferi*. Activates PPARα and the phospholipase C (PLC) signalling pathway. Stimulates peroxisomal fatty acyl-CoA oxidase activity. These effects can be blocked by staurosporine (Prod. No. ALX-380-014). Exhibits significant cytotoxic activities against numerous tumor cell lines. Binds tubulin. Inhibits angiogenesis. Reduces HIF-1α protein levels. Induces apoptosis. Antifungal.

LIT: Antifungal evaluation of pseudolaric acid B, a major constituent of Pseudolarix kaempferi: E. Li, et al.; J. Nat. Prod. **58,** 57 (1995) ▪ Five new diterpenoids from Pseudolarix kaempferi: S.P. Yang, et al.; J. Nat. Prod. **65,** 1041 (2002) ▪ Pseudolarix acid B inhibits angiogenesis by antagonizing the vascular endothelial growth factor-mediated anti-apoptotic effect: W.F. Tan, et al.; Eur. J. Pharmacol. **499,** 219 (2004) ▪ Pseudolaric acid B inhibits angiogenesis and reduces hypoxia-inducible factor 1alpha by promoting proteasome-mediated degradation: M.H. Li, et al.; Clin. Cancer Res. **10,** 8266 (2004) ▪ Pseudolaric acid B induces apoptosis through p53 and Bax/Bcl-2 pathways in human melanoma A375-S2 cells: X.F. Gong, et al.; Arch. Pharm. Res. **28,** 68 (2005) ▪ Pseudolaric acid B, a novel microtubule-destabilizing agent that circumvents multidrug resistance phenotype and exhibits antitumor activity in vivo: V.K. Wong, et al.; Clin. Cancer Res. **11,** 6002 (2005)

CAS: 82508-31-4



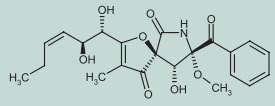
Pseudolaric acid B

Pseurotin A

ALX-350-300-M001 1 mg

Antibiotic. Isolated from *Aspergillus fumigatus*. Inhibitor of chitin synthase. Cytotoxic. Has nematicidal activity.

CAS: 58523-30-1



Pseurotin A

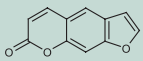
Psoralen

[Ficusin]

ALX-350-364-M025 25 mg
ALX-350-364-M100 100 mg

Isolated from *Psoralea corylifolia*. Shows antiviral, antibacterial, antifungal and insecticidal properties. Binds DNA through single and double-stranded cross-linking after photoactivation. Used as photochemical probe in studies of DNA mutation and repair mechanisms. Causes photosensitization in human.

CAS: 66-97-7
MI: **14:** 7928



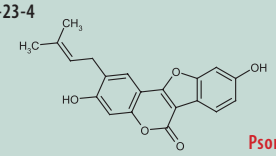
Psoralen

Psoralidin

ALX-350-323-M001 1 mg

Isolated from *Psoralea corylifolia*. Antineoplastic compound. Cytotoxic against stomach cancer cell lines. Shows antibacterial activity against *Shigella sonnei* and *S. flexneri*. Shows strong antioxidant activity and inhibits tyrosine phosphatase 1B (PTP1B) activity. Was shown to possess potent antidepressant properties.

CAS: 18642-23-4



Psoralidin

Pteroylglutamic acid see Folic acid

PTX see Pertussis Toxin

PTX-2 see Pectenotoxin-2

PTX A Protomer see Pertussis Toxin A Protomer

PTX B Oligomer see Pertussis Toxin B Oligomer

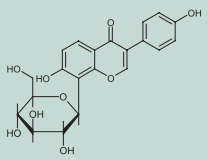
Puerarin

[NPI-031G]

ALX-350-249-M005 5 mg

Isolated from *Kudzu root*. Biologically active isoflavone. Affects serotonin levels and platelet aggregation in blood cells. Is a 5-HT2c antagonist. Antibacterial. Displays cardioprotective effects. Induces apoptosis.

CAS: 3681-99-0



Puerarin

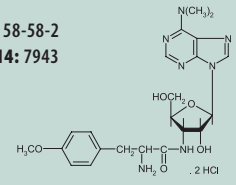
Puromycin . 2HCl

Bulk

ALX-380-028-M010 10 mg
ALX-380-028-M025 25 mg
ALX-380-028-M100 100 mg
ALX-380-028-M500 500 mg
ALX-380-028-G001 1 g

Isolated from *Streptomyces alboniger*. Interferes with protein formation by interfering with the function of RNA in the cells involved. Induces apoptosis.

CAS: 58-58-2
MI: **14:** 7943



Puromycin . 2HCl

Puromycin aminonucleoside

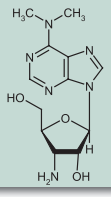
[3′-Amino-3′-deoxy-N,N-dimethyl-adenosine]

ALX-480-083-M010 10 mg
ALX-480-083-M050 50 mg
ALX-480-083-M250 250 mg

Antibiotic with antineoplastic properties. Does not inhibit protein synthesis or induce apoptosis. May cause nephrosis.

LIT: Puromycin aminonucleoside suppresses integrin expression in cultured glomerular epithelial cells: U. Krishnamurti, et al.; J. Am. Soc. Nephrol. **12,** 758 (2001)

CAS: 58-60-6



Puromycin aminonucleoside

3-Pyridinecarboxylic acid see Nicotinic acid

3-Pyridinecarboxylic amide see Nicotinamide

Pyridoxal . HCl

ALX-460-010-G010 10 g

Pyridoxal-5′-phosphate . H_2O

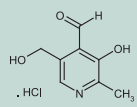
ALX-460-011-G005 5 g

Pyridoxol . HCl

[Pyridoxine ; Vitamin B6; Ademine]

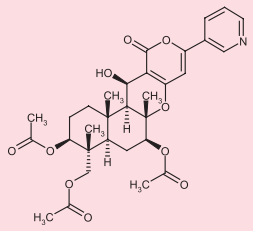
ALX-460-014-G010 10 g

CAS: 65-22-5
MI: **14:** 7978



Pyridoxal . HCl

CAS: 147444-03-9



Pyripyropene A

Pyripyropene A

[(+)-Pyripyropene A; PPPA]

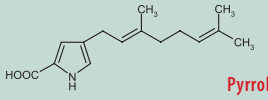
ALX-350-134-C500 500 µg

Isolated from *Aspergillus fumigatus*. Highly specific inhibitor of acyl-coenzyme A:cholesterol acetyltransferase 2 (ACAT2).

Fungal strain courtesy of The Kitasato Institute, Tokyo.

LIT: Pyripyropenes, highly potent inhibitors of acyl-CoA:cholesterol acyltransferase produced by Aspergillus fumigatus: S. Omura, et al.; J. Antibiot. (Tokyo) **46,** 1168 (1993) ▪ Pyripyropenes, novel inhibitors of acyl-CoA:cholesterol acyltransferase produced by Aspergillus fumigatus. II. Structure elucidation of pyripyropenes A, B, C and D: Y.K. Kim, et al.; J. Antibiot. (Tokyo) **47,** 154 (1994) ▪ Pyripyropenes, novel inhibitors of acyl-CoA:cholesterol acyltransferase produced by Aspergillus fumigatus. I. Production, isolation, and biological properties: H. Tomoda, et al.; J. Antibiot. (Tokyo) **47,** 148 (1994) ▪ Aflavinines and other antiinsectan metabolites from the ascostromata of Eupenicillium crustaceum and related species: H.J. Wang, et al.; Appl. Environ. Microbiol. **61,** 4429 (1995) ▪ Total Synthesis of (+)-Pyripyropene A, a Potent, Orally Bioavailable Inhibitor of Acyl-CoA:Cholesterol Acyltransferase: T. Nagamitsu, et al.; J. Org. Chem. **60,** 8126 (1995) ▪ Biosynthesis of Pyripyropene A: H. Tomoda, et al.; J. Org. Chem. **61,** 882 (1996) ▪ Meroterpenoids with various biological activities produced by fungi: K. Shiomi, et al.; Pure Appl. Chem. **71,** 1059 (1999) ▪ A formal synthesis of (+)-pyripyropene A using a biomimetic epoxy-olefin cyclisation: effect of epoxy alcohol/ether on cyclisation efficiency: V.K. Aggarwal, et al.; J. Chem. Soc. **1999,** 3315 ▪ Mass-production of human ACAT-1 and ACAT-2 to screen isoform-specific inhibitor: a different substrate specificity and inhibitory regulation: K.H. Cho, et al.; BBRC **309,** 864 (2003) ▪ Identification of ACAT1- and ACAT2-specific inhibitors using a novel, cell-based fluorescence assay: individual ACAT uniqueness: A.T. Lada, et al.; J. Lipid Res. **45,** 378 (2004) ▪ ACAT2 is localized to hepatocytes and is the major cholesterol-esterifying enzyme in human liver: P. Parini, et al.; Circulation **110,** 2017 (2004) ▪ Exploiting PdII and TlII chemistry to obtain gamma-dioxygenated terpenoids: synthesis of rostratone and novel approaches to aphidicolin and pyripyropene A: J. Justicia, et al.; JOC **70,** 8265 (2005) ▪ Total synthesis of alpha-pyrone meroterpenoids, novel bioactive microbial metabolites: T. Sunazuka and S. Omura; Chem. Rev. **105,** 4559 (2005) ▪ Potential therapeutics for obesity and atherosclerosis: inhibitors of neutral lipid metabolism from microorganisms: H. Tomoda & S. Omura; Pharmacol. Ther. **115,** 375 (2007)

CAS: 144314-68-1



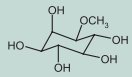
Pyrrolostatin

Pyrrolostatin

ALX-350-252-C100 100 µg
ALX-350-252-M001 1 mg

Isolated from *Streptomyces chrestomyceticus*. Potent inhibitor of lipid peroxidation. Free radical scavenger. Improves angiogenesis.

CAS: 642-38-6



L-Quebrachitol

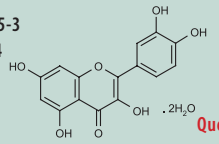
L-Quebrachitol

[1L-2-O-Methyl-chiro-inositol]

ALX-307-001-G001 1 g
ALX-307-001-G005 5 g
ALX-307-001-G025 25 g

Isolated from rubber tree. Key starting material for the synthesis of optically active inositol phosphates.

CAS: 6151-25-3
MI: **14:** 8034



Quercetin . $2H_2O$

Technical Note Page 108

Quercetin . $2H_2O$

[3,3′,4′,5,7-Pentahydroxyflavone]

ALX-385-001-G005 5 g

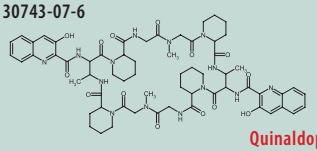
Antioxidant flavonoid. Inhibitor of mitochondrial ATPase, cAMP- and cGMP-phosphodiesterases. Inhibitor of protein tyrosine kinases and protein kinase C (PKC). Induces apoptosis. Blocks cells at the G0/G1 interface. Activator of human deacetylase SIRT1. Reversible inhibitor of fatty acid synthase (FAS). Inhibits the production of the inflammatory mediators nitric oxide (NO), TNF-α and IL-12 in activated macrophages.

Quercetin, Dihydro- see Taxifolin

Quercetin-3-rutinoside see Rutin

Qinghaosu see Artemisinin

CAS: 130743-07-6



Quinaldopeptin

Quinaldopeptin

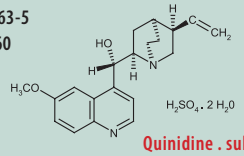
[Antibiotic BMY 28662; Antibiotic BU 3845T]

ALX-380-236-MC05 0.5 mg

Antibiotic. Isolated from *Amycolatopsis sp.* MST-AS5902. DNA bisintercalating agent. Displays antimicrobial, antifungal and cytotoxic properties. Shows antitumor activity *in vitro* and *in vivo*.

LIT: Quinaldopeptin, a novel antibiotic of the quinomycin family: S. Toda, et al.; J. Antibiot. (Tokyo) **43,** 796 (1990) ▪ Structure of actinotetraose hexatiglate, a unique glucotetraose from an actinomycete bacterium: R.W. Rickards, et al.; J. Antibiot. (Tokyo) **51,** 1093 (1998) ▪ Bisintercalator natural products with potential therapeutic applications: isolation, structure determination, synthetic and biological studies: S. Dawson, et al.; Nat. Prod. Rep. **24,** 109 (2007)

CAS: 6591-63-5
MI: **14:** 8060



Quinidine . sulfate . $2H_2O$

Quinidine . sulfate . $2H_2O$

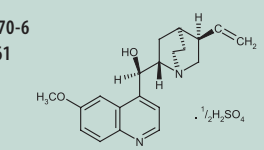
[Conquinine; β-Quinine]

ALX-550-291-G005 5 g

Diastereomer of quinine (Prod. No. ALX-550-292). Na^+ channel blocker. Class I antiarrhythmic drug.

LIT: Class I antiarrhythmic agents: quinidine, procainamide and N- acetylprocainamide, disopyramide: D.M. Roden & R.L. Woosley; Pharmacol. Ther. **23,** 179 (1983) ▪ Quinidine: J.W. Mason & L.M. Hondeghem; Ann. N. Y. Acad. Sci. **432,** 162 (1984) ▪ Quinidine: is it a good drug or a bad drug?: D.M. Salerno; Postgrad. Med. **92,** 131 (1992) ▪ Efficacy of quinidine in high-risk patients with Brugada syndrome: B. Belhassen, et al.; Circulation **110,** 1731 (2004)

CAS: 6119-70-6
MI: **14:** 8061



Quinine . hemisulfate

Quinine . hemisulfate

ALX-550-292-G010 10 g

Stereoisomer of quinidine (Prod. No. ALX-550-291). Plant alkaloid with a broad spectrum of biological effects including anti-cholinergic, hypoglycemic and antimalarial properties. K^+ channel blocker. Flavor component of tonic waters, bitter lemon and vermouth.

LIT: Class I antiarrhythmic agents: quinidine, procainamide and N-acetylprocainamide, disopyramide: D.M. Roden & R.L. Woosley; Pharmacol. Ther. **23,** 179 (1983) ▪ Quinine toxicity: D.N. Bateman & E.H. Dyson; Adverse Drug React. Acute Poisoning Rev. **5,** 215 (1986) ▪ Quinine-induced hypoglycemia: P.J. Limburg, et al.; Ann. Intern. Med. **119,** 218 (1993) ▪ Quinine inhibits mitochondrial ATP-regulated potassium channel from bovine heart: P. Bednarczyk, et al.; J. Membr. Biol. **199,** 63 (2004) ▪ The quest for quinine: those who won the battles and those who won the war: T.S. Kaufman & E.A. Ruveda; Angew. Chem. Int. Ed. Engl. **44,** 854 (2005) ▪ Effects of quinine, quinidine, and chloroquine on alpha9alpha10 nicotinic cholinergic receptors: J.A. Ballestero, et al.; Mol. Pharmacol. **68,** 822 (2005) ▪ Artesunate, artemether or quinine in severe Plasmodium falciparum malaria?: A. M. Checkley & C. J. Whitty; Expert. Rev. Anti. Infect. Ther. **5,** 199 (2007)

Quinomycin A see Echinomycin

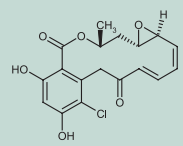
Radicicol

[Monorden]

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

Isolated from *Humicola fuscoatra.* Antifungal macrocyclic lactone antibiotic with antimalarial activity. Potent inhibitor of HSP90. Binds more strongly to HSP90 (nanomolar affinity) than to Grp94. Also binds to yeast HSP90, *E. coli* HtpG and TRAP-1. Non-competitive inhibitor of ATP citrate lyase. Anti-angiogenic. Specifically inhibits the interaction between HIF-1α/Arnt heterodimer and the hypoxia-responsive element (HRE), reducing VEGF expression. Protein tyrosine kinase inhibitor. Inhibitor of cyclooxygenase-2 (COX-2) expression without affecting COX-1 expression in LPS-stimulated macrophages. Induces the differentiation of HL-60 cells into macrophages, blocking cell cycle at G1 and G2. Suppressor of NIH 3T3 cell transformation by diverse oncogenes such as mos, ras and src in part by blocking the key signal transduction intermediates such as MAP kinase and GAP-associated p62. Inhibitor of AP-1-, NF-κB- and serum response factor (SRF)-mediated transcription (e.g. expression of iNOS). Represses the transcriptional function of the estrogen receptor. Inhibits archeal growth and DNA topoisomerase VI (a Topo IIB family topoisomerase). Blocks replication of negative-strand RNA viruses.

CAS: 12772-57-5
MI: **14:** 6253



Radicicol

Technical Note Page 98

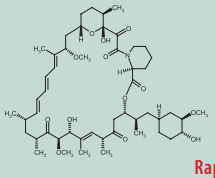
Rapamycin

[Sirolimus]

ALX-380-004-C100 100 µg
ALX-380-004-5100 5 x 100 µg
ALX-380-004-M001 1 mg
ALX-380-004-M005 5 mg
ALX-380-004-M025 25 mg

Isolated from *Streptomyces hygroscopicus.* Macrocyclic-triene antibiotic possessing potent immunosuppressant activity. It forms a complex with FKBP12 that binds to an effector, thus inhibiting IL-2 and other growth promoting lymphokines. The effectors were recently identified as FRAP (FKBP12 rapamycin-associated protein) and RAFT1 (rapamycin and KFBP12 target). Rapamycin induces inhibition of p70s6k, p33cdk2 and p34cdc2.

CAS: 53123-88-9
MI: **14:** 8114



Rapamycin

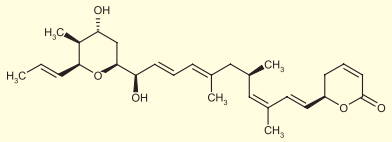
Ratjadone A (synthetic)

ALX-270-346-C002 2 µg

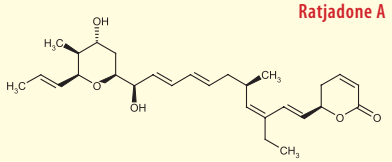
Synthetic. Represents a new class of natural compounds, which inhibit proliferation in eukaryotes by blocking nuclear export. As potent as leptomycin B (Prod. No. ALX-380-100) and specific for G1/S checkpoint. Cytotoxic secondary metabolite (IC_{50}=50pg/ml in mouse cell line L929) that arrests tumor cells in the G1 phase at remarkably low concentrations (50pg/ml in HeLa cell line KB3.1). Inhibits the binding between the nuclear export signal (NES) of proteins and the chromosome maintenance region protein (CRM1). Anticancer compound. Belongs to the family of orphan ligands which include polyketides like leptomycin B, callystatin A and other related compounds.

LIT: Antibiotics from gliding bacteria, LXIII. Ratjadone: a new antifungal metabolite from Sorangium cellulosum: D. Schummer, et al.; Liebigs Ann. **1995,** 685 ▪ Ratjadon: a new antifungal compound from Sorangium cellulosum (myxobacteria) production, physio-chemical and biological properties: J. Gerth, et al.; J. Antibiot. (Tokyo) **48,** 973 (1995) ▪ The chemistry and biology of ratjadone: M. Kalesse, et al.; ChemBioChem. **9,** 709 (2001) ▪ The chemistry and biology of the leptomycin family: M. Kalesse & M. Christmann; Synthesis **8,** 981 (2002) ▪ Ratjadone and leptomycin B block CRM1-dependent nuclear export by identical mechanisms: T. Meissner, et al.; FEBS Lett. **576,** 27 (2004) ▪ Nuclear targeting of adenovirus type 2 requires CRM1-mediated nuclear export: S. Strunze, et al.; Mol. Biol. Cell **16,** 2999 (2005)

CAS: 163564-92-9



Ratjadone A



Ratjadone C

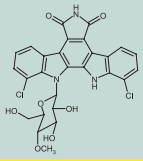
Ratjadone C (native)

ALX-270-369-C005 5 µg

Isolated from *Sorangium cellulosum.* Cytotoxic secondary metabolite that inhibits cell growth of mammalian cell lines in the picomolar range (IC_{50}=0.2ng/ml with L929 mouse cells) including multidrug (MDR) resistant HeLa cells (IC_{50}=0.1ng/ml with KB-V1). Like leptomycin B (Prod. No. ALX-380-100), ratjadone C binds covalently to the nuclear export protein CRM1. It inhibits cargo protein binding to the leucine-rich nuclear export sequence and thereby blocks nuclear export.

LIT: Antibiotics from gliding bacteria, LXIII. Ratjadone: a new antifungal metabolite from Sorangium cellulosum: D. Schummer, et al.; Liebigs Ann. **1995,** 685 (1995) ▪ Ratjadon: a new antifungal compound from Sorangium cellulosum (myxobacteria) production, physico-chemical and biological properties: K. Gerth, et al.; J. Antibiot. (Tokyo) **48,** 973 (1995) ▪ The chemistry and biology of the leptomycin family: M. Kalesse & M. Christmann; Synthesis **8,** 981 (2002) ▪ Ratjadones inhibit nuclear export by blocking CRM1/exportin 1: M. Koster, et al.; Exp. Cell. Res. **286,** 321 (2003)

CAS: 93908-02-2



Rebeccamycin

Technical Note Page 102

Rebeccamycin

ALX-380-079-C250 250 µg
ALX-380-079-M001 1 mg

Antibiotic. Isolated from *Streptomyces sp.* Weak topoisomerase I inhibitor structurally similar to staurosporine (Prod. No. ALX-380-014). Does not show any inhibitory activity against protein kinases. Shows significant antitumor properties *in vitro.*

Rebeccamycin, 6-N-[2-Diethylamino)ethyl]- see Becatecarin

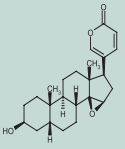
Resibufogenin

ALX-350-286-M010 10 mg

Isolated from *Bufonis venom.* Specific Na^+/K^+-ATPase inhibitor.

LIT: Effects of resibufogenin from toad venom on isolated Purkinje fibers: J.T. Xie, et al.; Am. J. Chin. Med. **28,** 187 (2000) ▪ Resibufogenin corrects hypertension in a rat model of human preeclampsia: H. Vu, et al.; Exp. Biol. Med. (Maywood) **231,** 215 (2006)

CAS: 465-39-4
MI: **14:** 8146



Resibufogenin

Technical Note Page 97

Resiniferatoxin (high purity)

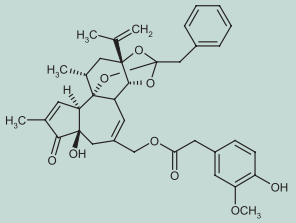
[RTX]

ALX-550-179-M001 1 mg
ALX-550-179-M005 5 mg
ALX-550-179-M050 50 mg

Isolated from *Euphorbia poisonii.* Ultrapotent capsaicin analog which stimulates protein kinase C (PKC). Potent agonist of TRPV1.

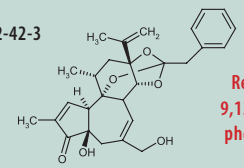
Resiniferatoxin, 5'-Iodo- see 5'-Iodo-resiniferatoxin

CAS: 57444-62-9



Resiniferatoxin

CAS: 57852-42-3



Resiniferonol 9,13,14-ortho-phenylacetate

Resiniferonol 9,13,14-ortho-phenylacetate [ROPA]

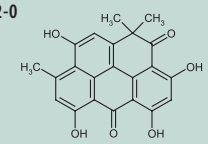
Bulk

ALX-350-074-M005 5 mg

20-Deacylated derivative of resiniferatoxin (Prod. No. ALX-550-179) and tinyatoxin. Not active as a capsaicin analog. Binds with high potency to protein kinase C (PKC). Useful as starting material for synthesis of resiniferatoxin analogs.

LIT: Cell cycle- and protein kinase C-specific effects of resiniferatoxin and resiniferonol **9,13,**14-ortho-phenylacetate in intestinal epithelial cells: M.R. Frey, et al.; Biochem. Pharmacol. **67,** 1873 (2004)

CAS: 20004-62-0



Resistomycin

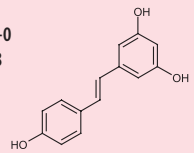
Resistomycin [Geliomycin; Heliomycin; Itamycin]

ALX-380-111-M001 1 mg

Isolated from *Streptomyces sp.* Antibacterial against Gram-positive and mycobacteria. Inhibits RNA polymerase. Induces apoptosis.

LIT: Effects of the antibiotic resistomycin on the synthesis of macromolecules: I. Haupt, et al.; Z. Allg. Mikrobiol. **156,** 411 (1975) ▪ 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) ▪ Effects of Polyphenolic Anthrone Derivatives,Resistomycin and Hypericin, on Apoptosis in Human Megakaryoblastic Leukemia CMK-7 Cell Line: Y. Shiono et al.; Z. Naturforsch. **57c,** 923 (2002)

CAS: 501-36-0
MI: **14:** 8158



Resveratrol

Technical Note Page 104

Resveratrol [*trans*-3,4′,5-Trihydroxystilbene]

Bulk

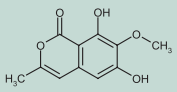
ALX-270-125-M050 50 mg
ALX-270-125-M100 100 mg
ALX-270-125-M250 250 mg

Isolated from *Polygonum cuspidatum.* 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.

Resveratrol-3β-mono-D-glucoside see Polydatin

Resveratol, Trimethoxy- see *trans*-3,4′,5-Trimethoxy-stilbene

CAS: 26246-41-3

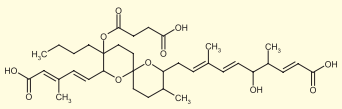


Reticulol

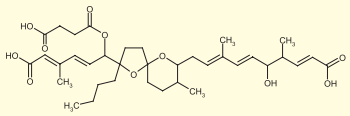
Reticulol

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

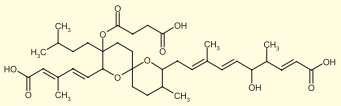
Antibiotic. Isolated from *Streptomyces sp.* Inhibitor of cyclic adenosine 3′,5′-monophosphate phosphodiesterase and topoisomerase I (Topo I). Antitumor agent.



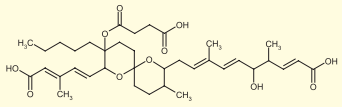
Reveromycin A



Reveromycin B



Reveromycin C



Reveromycin D

Reveromycin A

ALX-380-216-MC01 0.1 mg
ALX-380-216-MC25 0.25 mg

Antibiotic. Isolated from *Streptomyces sp.* MST-AS5344. Dominant analog of the reveromycin complex. Inhibitor of the mitogenic activity of epidermal growth factor (EGF). G1 phase cell cycle inhibitor, selectively inhibiting isoleucyl-tRNA synthetase. Displays antiproliferative as well as potent antifungal activity. Induces apoptosis in osteoclasts thus inhibiting bone resorption.

Reveromycin B

ALX-380-217-MC25 0.25 mg

Antibiotic. Isolated from *Streptomyces sp.* MST-AS5344. Much less active analog of reveromycin A (Prod. No. ALX-380-216), which is a G1 phase cell cycle inhibitor and induces apoptosis in osteoclasts. Useful negative control in resolving the mode of action of this class of compounds.

Reveromycin C

ALX-380-218-MC25 0.25 mg

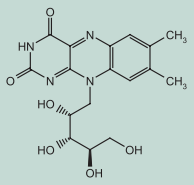
Antibiotic. Isolated from *Streptomyces sp.* MST-AS5344. Minor component of the reveromycin complex with similar biological profile as reveromycin A (Prod. No. ALX-380-216), which is a G1 phase cell cycle inhibitor and induces apoptosis in osteoclasts. Generally more potent than reveromycin A. Inhibitor of the mitogenic activity of epidermal growth factor (EGF).

Reveromycin D

ALX-380-219-MC25 0.25 mg

Antibiotic. Isolated from *Streptomyces sp.* MST-AS5344. Minor component of the reveromycin complex. Inhibitor of the mitogenic activity of epidermal growth factor (EGF). More active than reveromycin C (Prod. No. ALX-380-218).

CAS: 83-88-5
MI: **14:** 8200



Riboflavine

Riboflavine [Vitamin B2]

ALX-460-015-G010 10 g

Riboflavine-5′-phosphate . Na . $2H_2O$ [Flavine mononucleotide; FMN]

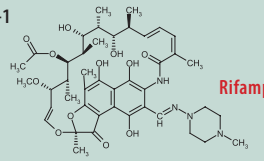
ALX-460-016-G001 1 g
ALX-460-016-G005 5 g

Rifampicin
[Rifampin; 3-(4-Methylpiperazinyl-iminomethyl)rifamycin SV]

ALX-380-071-M100 100 mg

Semisynthetic. Antibacterial (tuberculostatic). Inhibits DNA-dependent RNA polymerase. Potent inducer of hepatic cytochrome P450 enzymes.

CAS: 13292-46-1
MI: **14:** 8216



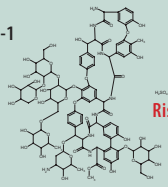
Rifampicin

Ristocetin A . sulfate
[Ristocetin; Ristomycin III; Spontin; Riston]

ALX-380-237-M010 10 mg

Isolated from *Amycolatopsis sp.* MST-AS5924. Potent antibacterial antibiotic. Induces platelet aggregation by binding to a factor absent in people suffering from von Willebrand's disease and is therefore an important diagnostic tool. Chiral selector for the separation of enantiomers by HPLC, TLC and electrophoresis.

CAS: 11140-99-1
MI: **14:** 8234

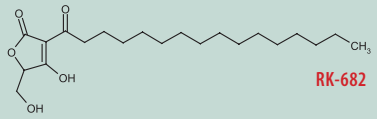


Ristocetin A . sulfate

RK-682
ALX-380-205-MC05 0.5 mg

Isolated from *Streptomyces sp.* MST-AS5358. Tetronic acid derivative with potent activity against HIV-1 protease. Inhibits protein tyrosine phosphatase and heparanase.

CAS: 154639-24-4



RK-682

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. Induces apoptosis.

Rocaglamide AL
[3',4'-Methylenedioxyrocaglamide]

ALX-350-140-C050 50 µg

For technical information and see product Rocaglamide (Prod. No. ALX-350-121).

Rocaglamide C
[3'-Hydroxyrocaglamide]

ALX-350-141-C050 50 µg

For technical information and see product Rocaglamide (Prod. No. ALX-350-121). ***Technical Note Page 97.***

Rocaglamide I
[1-Acetyl-3'-hydroxyrocaglamide]

ALX-350-142-C050 50 µg

For technical information and see product Rocaglamide (Prod. No. ALX-350-121). ***Technical Note Page 97.***

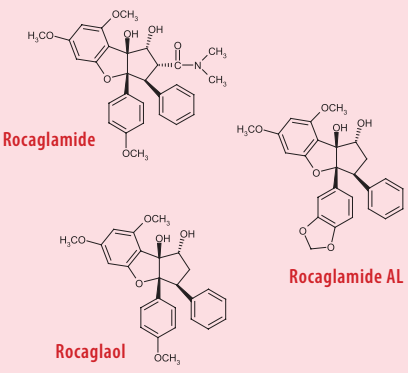
Rocaglamide J
[Aglafolin; 2-Methylrocaglate]

ALX-350-143-C050 50 µg

For technical information and see product Rocaglamide (Prod. No. ALX-350-121). ***Technical Note Page 97.***

Rocaglaol
ALX-350-135-C100 100 µg

Isolated from *Aglaia sp.* Derivative of rocaglamide (Prod. No. ALX-350-121), with similar pharmacological properties.



Rocaglamide

Rocaglamide AL

Rocaglaol

Technical Note Page 97

ROPA see Resiniferonol 9,13,14-ortho-phenylacetate

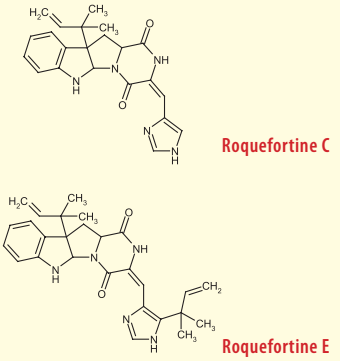
Roquefortine C
ALX-350-342-MC05 0.5 mg

Isolated from *Gymnoascus reesii* MST-FP1700. Potent neurotoxin produced by a diverse range of fungi, most notably Penicillium species. Inhibits growth of Gram-positive bacteria. Inhibits cytochrome p450.

Roquefortine E
ALX-350-343-M001 1 mg

Isolated from *Gymnoascus reesii* MST-FP1700. Analog of roquefortine C (Prod. No. ALX-350-342). Selective, albeit weakly active antitumor agent.

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



Roquefortine C

Roquefortine E

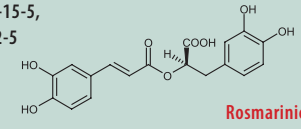
Technical Note Page 111

Rosmarinic acid
Bulk

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. Anticarcinogenic. Inhibitor of lipid peroxidation, TCR-induced T cell activation and proliferation.

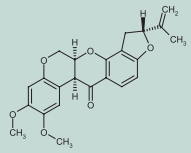
CAS: 537-15-5,
20283-92-2



Rosmarinic acid

Technical Note Page 103

CAS: 83-79-4
MI: **14:** 8271



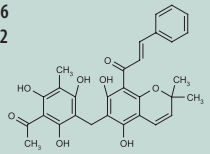
Rotenone

Rotenone

ALX-350-360-G001 1 g
ALX-350-360-G005 5 g

Isolated from *Lonchocarpus sp.* or *Derris sp.* Insecticide. Inhibitor of mitochondrial electron transport. Specifically inhibits NAD-linked substrate oxidation at the oxygen side of NADH dehydrogenase. Inhibits mammalian cell proliferation by inhibiting microtubule assembly through tubulin binding.

CAS: 82-08-6
MI: **14:** 8272



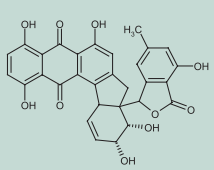
Rottlerin

Rottlerin

[Mallotoxin] Bulk

ALX-350-075-M010 10 mg
ALX-350-075-M025 25 mg

Isolated from *Mallotus philippinensis.* Mitochondrial uncoupler that depolarizes the mitochondrial membrane potential, reduces cellular ATP levels, activates 5'-AMP-activated protein kinase (AMPK) and affects mitochondrial production of reactive oxygen species (ROS). Potent activator of multiple Ca^{2+}-sensitive K^+ channels. Blocks several kinases and non-kinase proteins *in vitro.* Has been widely-used as a selective inhibitor of protein kinase Cδ (PKCδ). However, recent studies indicate that rottlerin has no direct effect on PKCδ and that it should not be used to determine the involvement of PKCδ in biological processes.



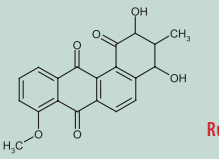
Rubellin D

Rubellin D

ALX-350-324-M001 1 mg

Isolated from fungus *Ramularia collo-cygni.* Phytotoxin. Triggers the light-dependent production of reactive oxygen species and α-linolenic acid peroxidation.

LIT: Secondary mould metabolites. XX. The structure of rubellins C and D, two novel anthraquinone metabolites from Mycosphae-rella rubella: A. Arnone et al.; Gazz. Chim. Ital. **119,** 35 (1989) ▪ Photodynamic oxygen activation by rubellin D, a phytotoxin produced by Ramularia collo-cygni (Sutton et Waller): I. Heiser et al.; Physiol. Mol. Plant Pathol. **62,** 29 (2003) ▪ The phytopathogenic fungus Ramularia collo-cygni produces biologically active rubellins on infected barley leaves: S. Miethbauer et al.; J. Phytopathol. **151,** 665 (2003) ▪ Fatty acid peroxidation by rubellin B, C, and D, phytotoxins produced by Ramularia collo-cygni (Sutton et Waller): I. Heiser et al.; Physiol. Mol. Plant Pathol. **64,** 135 (2004)



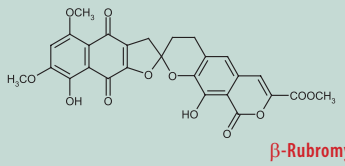
Rubiginone D2

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.

LIT: New biologically active rubiginones from Streptomyces sp.: C. Puder, et al.; J. Antibiot. (Tokyo) **53,** 329 (2000)



β-Rubromycin

β-Rubromycin

ALX-380-067-M001 1 mg
ALX-380-067-M005 5 mg

Isolated from *Streptomyces sp.* Antibiotic. Inhibitor of HIV-1 reverse transcriptase (RT). Inhibits human telomerase. Cytostatically active against different tumor cell lines.

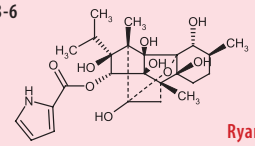
Rutin . $3H_2O$

[Quercetin-3-rutinoside; Vitamin P; 3,3',4',5,7-Pentahydroxyflavone-3-rutinoside]

ALX-460-028-G005 5 g

Antioxidant flavonoid. Nitric oxide (NO) scavenger. ***Technical Note Page 103.***

CAS: 15662-33-6
MI: **14:** 8307



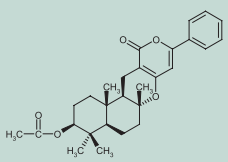
Ryanodine

Ryanodine (high purity)

Bulk

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

Isolated from *Ryania speciosa, Flacourtiaceae.* Potent neurotoxin. Blocks the release of Ca^{2+} from the sarcoplasmic reticulum. Has many complex effects on Ca^{2+} transport and action in the muscle.



S14-95

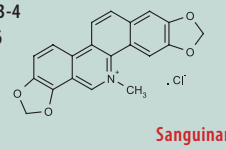
S14-95

ALX-350-299-MC05 0.5 mg

Isolated from *Penicillium sp.* Potent inhibitor of cytokine-induced activation of STAT1α leading to the inhibition of inducible expression of proinflammatory enzymes (COX-2, iNOS (NOS II)) and cytokines (TNF-α).

LIT: Sporogen, S14-**95,** and S-curvularin, three inhibitors of human inducible nitric-oxide synthase expression isolated from fungi: Y. Yao, et al.; Mol. Pharmacol. **63,** 383 (2003) ▪ S14-**95,** a novel inhibitor of the JAK/STAT pathway from a Penicillium species: G. Erkel, et al.; J. Antibiot. (Tokyo) **56,** 337 (2003)

CAS: 5578-73-4
MI: **14:** 8356



Sanguinarine chloride

Sanguinarine chloride

[Pseudochelerythrine]

ALX-350-076-M005 5 mg

Isolated from the leaves and stems of *Macleaya cordata* and *M. microcarpa.* Na^+/K^+-and Mg^{2+}-ATPase inhibitor. Antimicrobial, anti-inflammatory and antioxidant properties. Induces apoptosis. Modulates the Bcl-2 family. Shows antiplaque activity in humans.

Sapintoxin D (high purity)

[Phorbol 12-N-methylanthranilate] Bulk

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

Fluorescent, highly potent phorbol ester. Useful for membrane studies.

Sarafotoxin S6b

ALX-167-001-PC01 0.1 mg
ALX-167-001-PC05 0.5 mg
ALX-167-001-P001 1 mg

Synthetic. Originally isolated from *Atractaspis engaddensis.* Potent vasoconstrictor peptide. Causes hydrolysis of phosphoinositides in atrial and brain membranes.

Sarafotoxin S6c

ALX-167-002-PC01 0.1 mg
ALX-167-002-PC05 0.5 mg
ALX-167-002-P001 1 mg

Synthetic. Originally isolated from *Atractaspis engaddensis*. Potent vasoconstrictor peptide. Causes hydrolysis of phosphoinositides in atrial and brain membranes.

H-Cys-Ser-Cys-Lys-Asp-Met-Thr-Asp-Lys-Glu-Cys-Leu-Tyr-Phe-Cys-His-Gln-Asp-Val-Ile-Trp-OH (Disulfide bonds between Cys^{1}-Cys^{15} and Cys^{3}-Cys^{11}) **Sarafotoxin S6b**

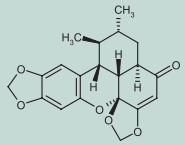
H-Cys-Thr-Cys-Asn-Asp-Met-Thr-Asp-Glu-Glu-Cys-Leu-Asn-Phe-Cys-His-Gln-Asp-Val-Ile-Trp-OH (Disulfide bonds between Cys^{1}-Cys^{15} and Cys^{3}-Cys^{11}) **Sarafotoxin S6c**

Sauchinone

ALX-350-116-M001 1 mg
ALX-350-116-M005 5 mg

Isolated from *Saururus chinensis*. Diastereomeric lignan with cytoprotective and antioxidant activities in cultured hepatocytes. Inhibitor of LPS-inducible iNOS (NOS II), TNF-α and COX-2 expression in macrophages through suppression of IκBα phosphorylation and p65 nuclear translocation and of C/EBP and/or AP-1 activation, which may have constitutive anti-inflammatory effects. Suppressor of NF-κB by inhibiting transactivation activity of the RelA subunit. Inhibits staurosporine (Prod. No. ALX-380-014)-induced apoptosis. Inhibits RANKL-induced osteoclastogenesis by reducing ROS generation.

LIT: Sauchinone, a lignan from Saururus chinensis, attenuates CCl4-induced toxicity in primary cultures of rat hepatocytes: S.H. Sung, et al.; Biol. Pharm. Bull. **23,** 666 (2000) ▪ Hepatoprotective diastereomeric lignans from Saururus chinensis herbs: S.H. Sung & Y.C. Kim; J. Nat. Prod. **63,** 1019 (2000) ▪ Sauchinone, a lignan from Saururus chinensis, suppresses iNOS expression through the inhibition of transactivation activity of RelA of NF-kappaB: B.Y. Hwang, et al.; Planta Med. **69,** 1096 (2003) ▪ Inhibition of lipopolysaccharide-inducible nitric oxide synthase, TNF-alpha and COX-2 expression by sauchinone effects on I-kappaBalpha phosphorylation, C/EBP and AP-1 activation: A.K. Lee, et al.; Br. J. Pharmacol. **139,** 11 (2003) ▪ Sauchinone, a lignan from Saururus chinensis, inhibits staurosporine-induced apoptosis in C6 rat glioma cells: H. Song, et al.; Biol. Pharm. Bull. **26,** 1428 (2003) ▪ Inhibition of osteoclast differentiation and bone resorption by sauchinone: K.Y. Han, et al.; Biochem. Pharmacol. **74,** 911 (2007)



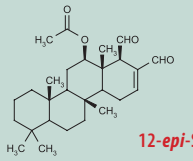
Sauchinone

12-*epi*-Scalaradial

ALX-350-234-M001 1 mg

Isolated from *Cacospongia sp.* Inhibitor of bee venom phospholipase A2 (PLA2). Inhibits Ca^{2+} mobilization induced by leukotriene B4 (LTB4) and platelet activating factor. Inhibits Ca^{2+}-dependent arachidonic acid release in human neutrophils. Inhibits epidermal growth factor (EGF)-stimulated Akt (protein kinase B; PKB) phosphorylation.

CAS: 53527-28-9



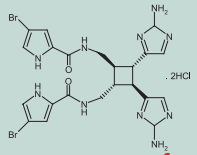
12-*epi*-Scalaradial

Sceptrin . 2HCl

ALX-350-264-M001 1 mg

Isolated from the sponge *Agelas nakamurai*. Inhibits the growth of several Gram-positive and Gram-negative bacteria. Competitively inhibits muscarinic acetylcholine receptors.

CAS: 79703-25-6



Sceptrin . 2HCl

(-)-Scopolamine . HBr

ALX-550-094-G001 1 g

Cholinergic antagonist.

Scyllatoxin

ALX-630-043-C100 100 µg

Synthetic. Originally isolated from *Leiurus quinquestriatus hebraeus*. Small conductance Ca^{2+}-activated K^{+} channel blocker.

H-Ala-Phe-Cys-Asn-Leu-Arg-Met-Cys-Gln-Leu-Ser-Cys-Arg-Ser-Leu-Gly-Leu-Leu-Gly-Lys-Cys-Lle-Gly-Asp-Lys-Cys-Glu-Gys-Val-Lys-His-NH_2 (Disulfide bonds are undetermined)

Scyllatoxin

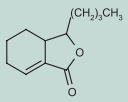
Sedanolide

ALX-350-229-M100 100 mg

Isolated from *Apium graveolens L.* Inducer of glutathione S-transferases and inhibitor of chemically induced carcinogenesis. Mosquitocidal, nematicidal and antifungal. Was shown to inhibit cyclooxygenase-1 and -2 (COX-1 and COX-2) as well as topoisomerase I and topoisomerase II.

LIT: Chemoprevention of benzo[a]pyrene-induced forestomach cancer in mice by natural phthalides from celery seed oil: G.-Q. Zheng, et al.; Nutr. Cancer **19,** 77 (1993) ▪ Mosquitocidal, nematicidal, and antifungal compounds from Apium graveolens L. seeds: R.A. Momin & M.G. Nair; J. Agric. Food Chem. **49,** 142 (2001) ▪ Sedanolide, a natural phthalide from celery seed oil: effect on hydrogen peroxide and tert-butyl hydroperoxide-induced toxicity in HepG2 and CaCo-2 human cell lines: J.A. Woods, et al.; In Vitr. Mol. Toxicol. **14,** 233 (2001) ▪ Antioxidant, cyclooxygenase and topoisomerase inhibitory compounds from Apium graveolens Linn. seeds: R.A. Momin & M.G. Nair; Phytomedicine **9,** 312 (2002)

CAS: 6415-59-4



Sedanolide

Technical Note Page 104

Silybin

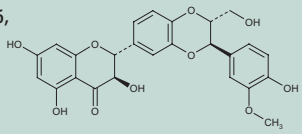
[Silibinin] Bulk

ALX-350-346-G001 1 g
ALX-350-346-G005 5 g

Flavonoid. Major active constituent of silymarin. Anti-inflammatory, cytoprotective and anti-cancer compound. Shows chemopreventive effect against skin cancer. Inhibits mitogen-activated protein kinase (MAPK). Inhibits P-glycoprotein (Pgp)-mediated cellular efflux. Inhibits cytochrome P450 enzymes. Blocks the production of superoxide in Kupffer cells (EC_{50}=100µM). Antioxidant. Free radical scavenger.

LIT: Inhibition of Kupffer cell functions as an explanation for the hepatoprotective properties of silibinin: C. Dehmlow, et al.; Hepatology **23,** 749 (1996) ▪ Silibinin upregulates the expression of cyclin-dependent kinase inhibitors and causes cell cycle arrest and apoptosis in human colon carcinoma HT-29 cells: C. Agarwal, et al.; Oncogene **22,** 8271 (2003) ▪ Epidermal growth factor receptor mediates silibinin-induced cytotoxicity in a rat glioma cell line: L. Qi, et al.; Cancer Biol. Ther. **2,** 526 (2003) ▪ Silibinin down-regulates survivin protein and mRNA expression and causes caspases activation and apoptosis in human bladder transitional-cell papilloma RT4 cells: A.K. Tyagi, et al.; BBRC **312,** 1178 (2003) ▪ Prostate cancer prevention by silibinin: R.P. Singh & R. Agarwal; Curr. Cancer Drug Targets **4,** 1 (2004) ▪ Silibinin inhibits invasion of oral cancer cells by suppressing the MAPK pathway: P.N. Chen, et al.; J. Dent. Res. **85,** 220 (2006) ▪ Effects and mechanisms of silibinin on human hepatoma cell lines: J.J. Lah, et al.; World J. Gastroenterol. **13,** 5299 (2007)

CAS: 22888-70-6, 65666-07-1
MI: 14: 8532



Silybin

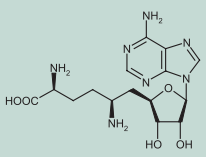
Sinefungin

[A-9145; Adenosylornithine]

ALX-380-070-M001 1 mg
ALX-380-070-M005 5 mg

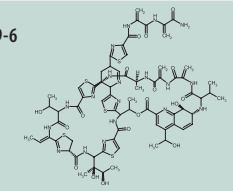
Strong competitive inhibitor of methyltransferases which uses S-adenosyl-1-methionine as the methyl group donor to yield methylated products such as 5-methylcytosine or N^{6}-methyl adenosine on DNA and RNA. In addition, sinefungin is involved in a number of physiological processes.

CAS: 58944-73-3
MI: 14: 8544



Sinefungin

CAS: 12656-09-6

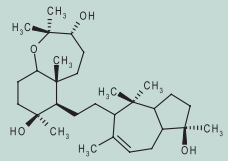


Siomycin

Siomycin [Mutabilycin; Sporangiomycin; Antibiotic 6741-21]

ALX-380-243-MC05 0.5 mg

Antibiotic. Isolated from *Streptomyces sp.* MST-AS4617. Shows potent and selective antibacterial activity. Potent inhibitor of the oncogenic transcription factor forkhead box M1 (FoxM1) that downregulates protein and mRNA levels of FoxM1. Inhibits FoxM1 induced cell growth.



Sipholenol A

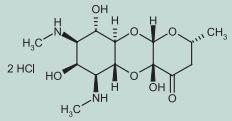
Sipholenol A

ALX-350-358-C100 100 µg

Isolated from marine sponge *Callyspongia siphonella* formerly known as *Siphonochalina siphonella.* Efficiently inhibits the function of P-glycoprotein (Pgp). A new reversing agent for treatment of multidrug resistance (MDR) in Pgp-overexpressing tumors. Antiproliferative activity. Cytotoxic.

Sirolimus see Rapamycin

CAS: 22189-32-8
MI: **14:** 8739



Spectinomycin . 2HCl . $5H_2O$

Spectinomycin . 2HCl . $5H_2O$

ALX-380-278-G005 5 g

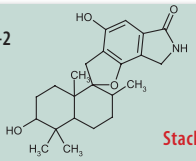
Antibiotic. Isolated from *Streptomyces sp.* Inhibits protein synthesis (elongation) by interfering with peptidyl tRNA translocation. Effective against Gram-negative and Gram-positive bacteria (*Gonnococcus* only). Mutation in rpsE (the gene for ribosomal protein S5) prevents binding of spectinomycin.

Stachybotrylactam [2-Deoxy Antibiotic F1839A]

ALX-630-112-MC05 0.5 mg

Isolated from *Stachybotrys sp.* MST-FP1752. Mycotoxin. Immunosuppressive. Weakly inhibits HIV-1 protease.

CAS: 163391-76-2



Stachybotrylactam

Technical Note Page 111

Step up to the Source™

The Staurosporine Source™

Staurosporine [Antibiotic AM-2282]

Bulk

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

Isolated from *Streptomyces staurosporeus.* Model apoptosis inducer. Potent cell permeable inhibitor of a variety of protein kinases, e.g protein kinase C (PKC) and cyclin-dependent kinases (CDKs).

Staurosporine Aglycone see K-252c

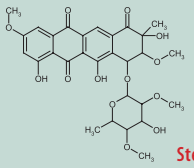
Staurosporine, 4′-N-Benzoyl- see PKC412

Staurosporine, 7-Oxo- see 7-Oxostaurosporine

Staurosporinone see K-252c

Technical Note Page 100.

CAS: 54526-94-2



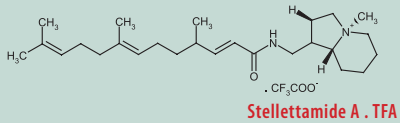
Steffimycin B

Steffimycin B [Antibiotic U-40615]

ALX-380-220-M001 1 mg

Isolated from *Streptomyces sp.* MST-AS5455. DNA-binding agent. Displays antibacterial and antineoplastic properties. Potential antitumor agent.

CAS: 129744-24-7



Stellettamide A . TFA

Stellettamide A . TFA

ALX-350-311-C100 100 µg

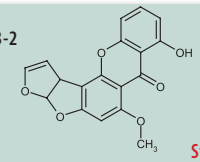
Isolated from the marine sponge *Stellata sp.* Inhibits intrinsic tyrosine fluorescence in a concentration-dependent manner. Binds to calmodulin and inhibits Ca^{2+}/calmodulin-dependent enzyme activities.

Sterigmatocystin

ALX-630-116-M001 1 mg
ALX-630-116-M005 5 mg

Mycotoxin produced by strains of the common molds. Inhibitor of DNA synthesis. Induces sister chromatid exchanges in bone marrow cells of mice. Causes necrosis.

CAS: 10048-13-2



Sterigmatocystin

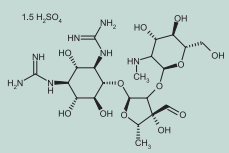
Technical Note Page 111

Stichodactyla Toxin [ShK]

ALX-630-044-C100 100 µg

Synthetic. Originally isolated from sea anemone *Stichodactyla helianthus.* Voltage-dependent K^+ channel (A channel) blocker. Inhibitor of T cell activation. Immunosuppressor.

CAS: 3810-74-0
MI: **14:** 8826



Streptomycin . sulfate

Streptomycin . sulfate

ALX-380-277-G010 10 g
ALX-380-277-G100 100 g

Antibiotic. Isolated from *Streptomyces sp.* Inhibits prokaryote protein synthesis. Binds to the S12 protein of the 30S ribosomal subunit. Effective against Gram-negative and Gram-positive bacteria. Mutation in rpsL (the gene for S12 ribosomal protein) prevents binding of streptomycin to ribosome. Inactivated by aminoglycoside phosphotransferase.

Streptonivicin see Novobiocin

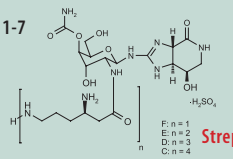
Streptothricin . sulfate

[Nourseothricin . sulfate]

ALX-380-025-M001 1 mg
ALX-380-025-M005 5 mg

Antibiotic. Isolated from *Streptomyces noursei.* Active against both Gram-positive and Gram-negative bacteria and some fungi.

CAS: 96736-11-7
MI: **14:** 8829



Streptothricin . sulfate

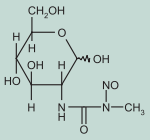
Streptozotocin

[Streptozocin] Bulk

ALX-380-010-M100 100 mg
ALX-380-010-5100 5 x 100 mg
ALX-380-010-G001 1 g

Widely used diabetes inducer in rodents. Inhibition of β-cell O-GlcNAcase by streptozotocin is the mechanism that accounts for its diabetogenic toxicity. N-nitroso-containing antibiotic, acting as a nitric oxide (NO) donor. Potent methylating agent for DNA.

CAS: 18883-66-4
MI: **14:** 8832



Streptozotocin

Strophanthin G see **Ouabain . 8H$_2$O**

DL-Sulforaphane

[R,S-Sulforaphane; (±)-1-Isothiocyanato-4-methylsulfinyl-butane]

ALX-350-232-M025 25 mg

Synthetic. Potent, selective inducer of phase II detoxification enzymes. Inhibits chemically induced mammary tumor formation in rats. Inhibits LPS-induced HMGB1 (high mobility group box 1) secretion.

L-Sulforaphane

[R-Sulforaphane; (-)-1-Isothiocyanato-(4R)-(methylsulfinyl)butane]

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.

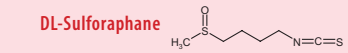
L-Sulforaphene

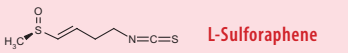
[S-Sulforaphene; (-)-4-Isothiocyanato-(1S)-(methylsulfinyl)-1-butene; Raphanin]

ALX-350-231-M010 10 mg

Chiral natural product isolated from radish seeds *(Raphanus sativus L.)* and broccoli. Shows antitumor activity.

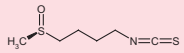
DL-Sulforaphane





L-Sulforaphene

L-Sulforaphane



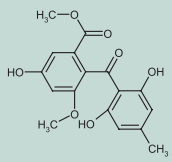
Technical Note Page 104

Sulochrin

ALX-380-221-M001 1 mg

Isolated from *Aspergillus terreus* MST-FP1370. Fungal metabolite found in a number of *Aspergillus* and *Penicillium sp.* Inhibitor of vascular endothelial growth factor (VEGF). Antiangiogenic agent. Inhibits eosinophil activation and chemotaxis.

CAS: 519-57-3



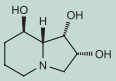
Sulochrin

Swainsonine

ALX-350-077-MC05 0.5 mg
ALX-350-077-M001 1 mg

Synthetic. Reversibly inhibits the active site of lysosomal α-mannosidase. Also inhibits the growth of tumors and prevents metastasis in murine models. Could inhibit cell proliferation *in vitro* and the growth of human gastric carcinoma *in vivo.* Blocks the processing of high mannose oligosaccharides to form complex type oligosaccharides.

CAS: 72741-87-8



Swainsonine

Swinholide A

ALX-350-088-C010 10 µg
ALX-350-088-C050 50 µg

From marine sponge *Theonella swinhoei.* Disrupts the actin cytoskeleton of cells grown in culture. Stabilizes actin dimers and severs actin filaments.

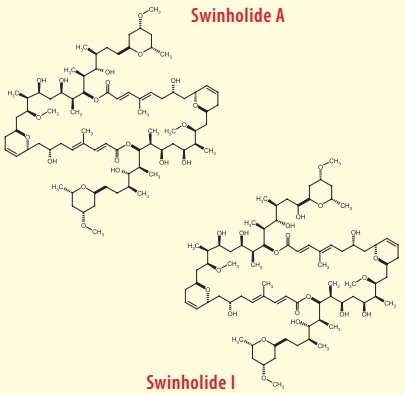
Swinholide I

ALX-350-356-C010 10 µg

Isolated from marine sponge *Theonella swinhoei.* First analog of swinholide A with a hydroxylated side-chain. It shows potent cytotoxicity against the human colon adenocarcinoma cell line HCT-116 by disruption of the actin cytoskeleton. Has antifungal activity against *Candida albicans.*

LIT: Marine natural products. XXIII. Three new cytotoxic dimeric macrolides, swinholides B and C and isoswinholide A, congeners of swinholide A, from the Okinawan marine sponge Theonella swinhoei: M. Kobayashi, et al.; Chem. Pharm. Bull. (Tokyo) **38,** 2960 (1990) ▪ Marine natural products. XXXI. Structure-activity correlation of a potent cytotoxic dimeric macrolide swinholide A, from the Okinawan marine sponge Theonella swinhoei, and its isomers: M. Kobayashi, et al.; Chem. Pharm. Bull. (Tokyo) **42,** 19 (1994) ▪ **For a comprehensive bibliography please visit our website www.alexis-biochemicals.com.**

Swinholide A



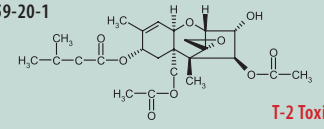
Swinholide I

T-2 Toxin

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.

CAS: 21259-20-1

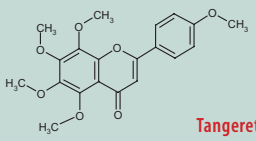


T-2 Toxin

Technical Note Page 111

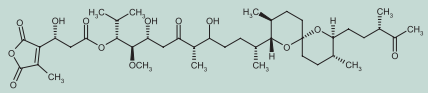
Tacrolimus see **FK506**

CAS: 481-53-8



Tangeretin

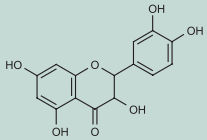
Technical Note Page 105



CAS: 109946-35-2

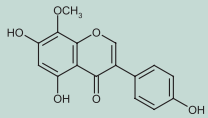
Tautomycin

CAS: 480-18-2

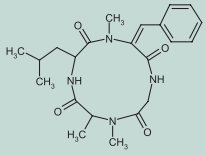


(±)-Taxifolin

Technical Note Page 108

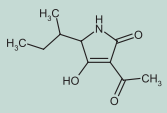


psi-Tectorigenin



Tentoxin

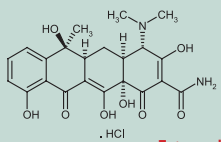
CAS: 610-88-8
MI: **14:** 9149



Tenuazonic acid

Technical Note Page 111

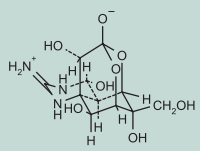
CAS: 64-75-5
MI: **14:** 9196



. HCl

Tetracycline . HCl

CAS: 4368-28-9
MI: **14:** 9246



Tetrodotoxin (citrate free)

TAN 1415A see **Asterric acid**

(-)-TAN 2162 see **Kendomycin**

Tannic acid see **Gallotannin**

Tangeretin

[4′,5,6,7,8-Pentamethoxyflavone; Ponkanetin]

ALX-385-027-M010 10 mg

Flavonoid found in the peel of citrus fruits where it provides natural resistance to fungi. Induces G1 cell cycle arrest in cancer cells. Counteracts tumor promoter-induced inhibition of intercellular communication and inhibits cell proliferation in several cancer lines. Reduces elevation of blood pressure and plasma glucose levels.

Tautomycin

ALX-380-041-C025 25 µg
ALX-380-041-C050 50 µg
ALX-380-041-C100 100 µg

Isolated from *Streptomyces spiroverticillatus*. Cell permeable, potent protein phosphatase inhibitor. Apoptosis inducer. Mixture of two isomers.

(±)-Taxifolin

[(±)-Dihydroquercetin; (±)-3,3′,4′,5,7-Pentahydroxyflavanone; Taxifoliol; Distylin]

ALX-385-006-M010 10 mg
ALX-385-006-M050 50 mg

Antioxidant flavonoid.

(+)-Taxifolin

[Dihydroquercetin; (+)-3,3′,4′,5,7-Pentahydroxyflavanone; Taxifoliol; Distylin]

ALX-385-018-M010 10 mg
ALX-385-018-M050 50 mg

Antioxidant flavonoid. Anti-inflammatory compound. Chemopreventive agent. Decreases hepatic lipid synthesis.

LIT: Structure-antioxidant activity relationships of flavonoids and phenolic acids: C.A. Rice-Evans, et al.; Free Radical Biol. & Med. **20,** 933 (1996) ▪ Modulation of hepatic lipoprotein synthesis and secretion by taxifolin, a plant flavonoid: A. Theriault, et al.; J. Lipid Res. **41,** 1969 (2000) ▪ Prevention of macrophage adhesion molecule-1 (Mac-1)-dependent neutrophil firm adhesion by taxifolin through impairment of protein kinase-dependent NADPH oxidase activation and antagonism of G protein-mediated calcium influx: Y.H. Wang, et al.; Biochem. Pharmacol. **67,** 2251 (2004) ▪ The chemopreventive effect of taxifolin is exerted through ARE-dependent gene regulation: S.B. Lee, et al.; Biol. Pharm. Bull. **30,** 1074 (2007)

TDM see **Trehalose 6,6′-dimycolate**

psi-Tectorigenin

ALX-270-123-C500 500 µg
ALX-270-123-M001 1 mg

Inhibitor of EGFR tyrosine kinase, blocking phosphatidylinositol turnover.

Tefestrol see **Ferutinin**

Tentoxin

ALX-350-132-MC05 0.5 mg

Isolated from *Alternaria alternata*. Cyclic tetrapeptide. Inhibitor of chloroplast F1-ATPase (CF1). Does not inhibit the homologous enzymes from chloroplasts of insusceptible plant species or from bacteria or mitochondria.

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. May act as a mycotoxin.

Tetracycline . HCl

ALX-380-060-G005 5 g

Broad-spectrum antibiotic with anti-inflammatory activity. Blocks bacterial protein synthesis by inhibiting binding of aminoacyl tRNA to A-site of ribosomes. Tetracycline-controlled systems are used to control gene expression on transgenic mice. Marker of bone formation.

Tetrahydrolipstatin see **Orlistat**

2′,3,4,4′-Tetrahydroxychalcone see **Butein**

3,4′,5,7-Tetrahydroxyflavone see **Kaempferol**

3′,4′,5,7-Tetrahydroxyflavone see **Luteolin**

3,4′,5,7-Tetrahydroxyflavylium chloride see **Pelargonidin chloride**

3,4′,5,7-Tetrahydroxy-3′-methoxyflavylium chloride see **Peonidin chloride**

3,4,3′,5′-Tetrahydroxy-*trans*-stilbene see **Piceatannol**

Tetrodotoxin (citrate free)

[Fugu poison; TTX]

ALX-630-002-M001 1 mg

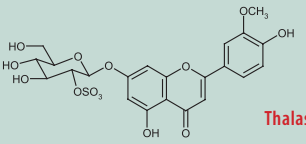
Isolated from ovaries and liver of chinese puffer fish. Potent neurotoxin. Blocks voltage-gated fast Na^+ channels in nerve cell membranes.

Thalassiolin B

ALX-350-296-MC05 0.5 mg

Isolated from *Thalassia testudianum*. Inhibitor of HIV cDNA integrase.

LIT: Thalassiolins A-C: new marine-derived inhibitors of HIV cDNA integrase: D.C. Rowley, et al.; Bioorg. Med. Chem. **10,** 3619 (2002)



Thalassiolin B

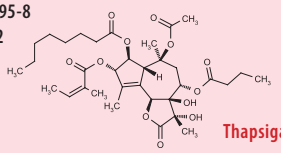
Thapsigargin

Bulk

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

Cell permeable tumor promoter by specific inhibition of the (sarco)endoplasmatic reticulum Ca^{2+}-ATPase (SERCA). Inhibition of SERCA reveals a significant change in intracellular Ca^{2+} homeostasis and pH regulation in tumor cells. Does not increase inositol phosphates. Shows no effect on protein kinase C (PKC). Increases Ca^{2+}-dependent Na^{+} influx in human platelets in a dose-dependent manner. Induces apoptosis. Stimulates nitric oxide (NO) production, contributing to hepatocyte apoptosis.

CAS: 67526-95-8
MI: **14:** 9272



Thapsigargin

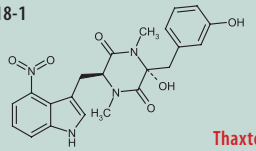
Thaxtomin A

[Thaztomin A]

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

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

CAS: 122380-18-1



Thaxtomin A

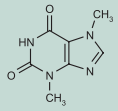
Theobromine

[3,7-Dimethylxanthine]

ALX-480-061-G005 5 g
ALX-480-061-G025 25 g

Weak phosphodiesterase inhibitor and adenosine receptor blocker. Diuretic and smooth-muscle relaxant.

CAS: 83-67-0
MI: **14:** 9282



Theobromine

Technical Note Page 105

Theonellapeptolide 1d

ALX-350-295-M001 1 mg

Isolated from sponge *Theonella swinhoei*. Cytotoxic.

cyclo-L-Val-N-Me-D-Leu-[L-Thr-βAla-D-Leu-N-Me-L-Ile-βAla-D-alle-N-Me-D-Val-N-Me-L-Ala-βAla-D-Leu-N-Me-D-alle]

Theonellapeptolide 1d

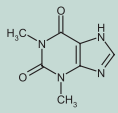
Theophylline

[1,3-Dimethylxanthine]

ALX-480-062-G005 5 g
ALX-480-062-G025 25 g

Cyclic phosphodiesterase inhibitor. Weakly inhibits alkaline phosphodiesterases and 5′-nucleotidase. Muscle relaxant, cardiac stimulant and diuretic. Used for the treatment of asthma.

CAS: 58-55-9
MI: **14:** 9285



Theophylline

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Theophylline, 7-(β-Hydroxyethyl)-

[7-(β-Hydroxyethyl)theophylline; Etofylline]

ALX-480-067-G005 5 g

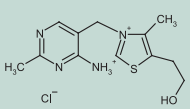
Weak phosphodiesterase inhibitor resembling theophylline (Prod. No. ALX-480-062) in its pharmacological profile. Used as an intermediate in the preparation of 7-substituted xanthines.

Thiamine . HCl

[Vitamin B1; Aneurin]

ALX-460-017-G010 10 g

CAS: 67-03-8
MI: **14:** 9295



Thiamine . HCl

Thielavin A

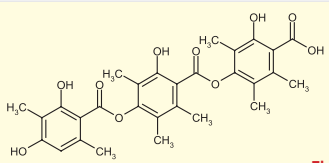
ALX-350-339-MC05 0.5 mg

Isolated from an unidentified fungus MST-FP1888. Fungal metabolite. Glucose-6-phosphatase inhibitor. Inhibitor of prostaglandin biosynthesis.

Thielavin B

ALX-350-340-MC05 0.5 mg

Isolated from an unidentified fungus MST-FP1888. Fungal metabolite. Glucose-6-phosphatase inhibitor. Potent inhibitor of phospholipase C. Inhibits telomerase, viral reverse transcriptase, peptidoglycan formation, and prostaglandin biosynthesis.



Thielavin A

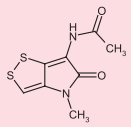
Thimerosal

[Ethyl mercurithiosalicylic acid; Mercurothiolate]

ALX-400-013-G005 5 g

Modulates thiol groups in biological systems, especially in those involving cAMP, Ca^{2+} and inositol phosphate. Causes a release of calcium from intracellular stores in many cells types. Has toxic effects on several cell types. Induces apoptosis *in vitro*.

CAS: 87-11-6
MI: **14:** 9342



Thiolutin

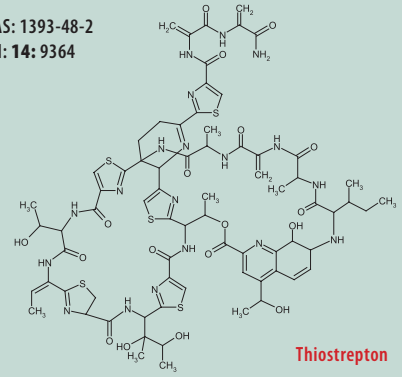
Thiolutin [Farcinicine; Acetopyrrothine]

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

Sulfur-containing antibiotic. Isolated from *Streptomyces luteosporeus.* Potent inhibitor of bacterial and yeast RNA polymerases. Inhibits mRNA chain elongation. Inhibits adhesion of human umbilical vein endothelial cells (HUVECs) to vitronectin 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) ▪ Inhibition of messenger ribonucleic acid synthesis in Escherichia coli by thiolutin: G.G. Khachatourians and D.J. Tipper; J. Bacteriol. **119,** 795 (1974) ▪ In vivo effect of thiolutin on cell growth and macromolecular synthesis in Escherichia coli: G.G. Khachatourians and D.J. Tipper; Antimicrob. Agents Chemother. **6,** 304 (1974) ▪ Cell wall synthesis regulation in Saccharomyces cerevisiae. Effect of RNA and protein inhibition: M.V. Elorza, et al.; Biochim. Biophys. Acta **454,** 263 (1976) ▪ The yeast heat shock response is induced by conversion of cells to spheroplasts and by potent transcriptional inhibitors: C.C. Adams and D.S. Gross; J. Bacteriol. **173,** 7429 (1991) ▪ 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)

CAS: 1393-48-2
MI: **14:** 9364



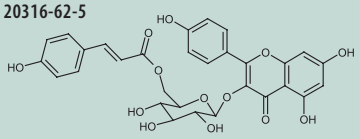
Thiostrepton

Thiostrepton

ALX-380-261-G001 1 g
ALX-380-261-G005 5 g

Antibiotic. Isolated from *Streptomyces azureus.* Inhibits protein synthesis by preventing binding of GTP to the 50S ribosomal subunit. Inhibits binding of elongation factor G (EF-G) and the dissociation of EF-G from the ribosome.

CAS: 20316-62-5



Tiliroside

Tiliroside

ALX-350-305-M001 1 mg

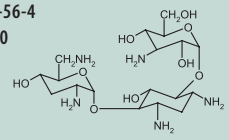
Isolated from *Tilia sp.* Flavonoid which shows anti-complement, anti-inflammatory and free radical scavenger activity. Inhibits the production of the inflammatory mediators nitric oxide (NO), TNF-α and IL-12 in activated macrophages. Shows potent activity against d-GalN-induced cytotoxicity in hepatocytes. Cytotoxic against specific leukaemic cell lines. Inhibits LDL oxidation. Antibacterial and antifungal.

Tobramycin [Deoxykanamycin B; Distobram; Gernebcin; Obramycin; Tobradistin]

ALX-380-018-M010 10 mg
ALX-380-018-M050 50 mg
ALX-380-018-M250 250 mg
ALX-380-018-G001 1 g

Isolated from *Streptomyces tenebarius.* Aminoglycoside antibiotic with similar structure to the kanamycins and the gentamycins. Used in the treatment of respiratory infection and cystic fibrosis.

CAS: 32986-56-4
MI: **14:** 9490



Tobramycin

DL-α-Tocopherol (high purity) [Vitamin E]

ALX-460-018-G001 1 g

DL-α-Tocopherol . acetate [Vitamin E]

ALX-460-019-G005 5 g

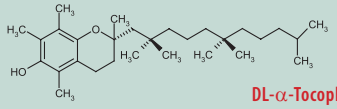
Topotecan . HCl [9-[(Dimethylamino)methyl]-10-hydroxy-(20S)-camptothecin]

Bulk

ALX-350-133-M001 1 mg
ALX-350-133-M005 5 mg
ALX-350-133-M025 25 mg

Semisynthetic. Potent antitumor agent. Inhibitor of DNA-topoisomerase. Analog of (S)-(+)-camptothecin (Prod. No. ALX-350-015). Used in chemotherapy of several different cancers.

CAS: 61512-20-7
MI: **14:** 9548



DL-α-Tocopherol

Toxin A

ALX-630-100-C002 2 µg
ALX-630-100-C100 100 µg

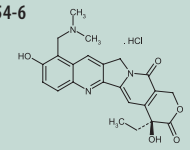
Isolated from *Clostridium difficile.*Has potent cytotoxic and enterotoxic properties. Translocates to the cytosol of target cells and glucosylates small GTP-binding proteins such as Rho, Rac, and Cdc42. Induces actin condensation, cell death and opening of the tight junctions. Triggers release of proinflammatory cytokines from intestinal epithelial cells probably via activation of MAP kinases. Each lot is tested to confirm binding activity to fresh rabbit red blood cells using a hemagglutination assay.

Toromycin B see Anandimycin B

Toyomycin see Chromomycin A_3

TPA see Phorbol 12-myristate 13-acetate

CAS: 119413-54-6
MI: **14:** 9548



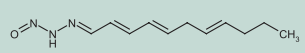
Topotecan . HCl

Trehalose 6,6′-dimycolate [Cord Factor; TDM]

ALX-581-210-M001 1 mg

Isolated from *M. tuberculosis.* Endotoxin content <0.002EU/µg (LAL test; BioWhittaker). ***Technical Note Page 95.***

CAS: 76896-80-5



Triacsin C

Triacsin C [WS1228A]

ALX-380-285-MC05 0.5 mg
ALX-380-285-M001 1 mg

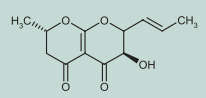
Isolated from *Streptomyces aureofaciens.* Analog of polysaturated fatty acid. Potent inhibitor of long-chain fatty acyl CoA synthetase. Selectively inhibits arachidonoyl-CoA synthetase in intact cells. Blocks β-cell apoptosis induced by fatty acids (lipoapoptosis) and synthesis of triglycerides, diglycerides and cholesterol esters. Potent vasodilator. Used in a rat model of obesity.

Trichodion

ALX-350-261-C100 100 µg
ALX-350-261-C500 500 µg

Isolated from *Trichosporiella sp.* Inhibits NF-κB, AP-1 and STAT1α mediated gene expression induced by IFN-γ resulting in inhibition of cyclooxygenase-2 (COX-2) and inducible nitric oxide synthase (iNOS; NOS II) expression.

LIT: Trichodion, a new inhibitor of inflammatory signal transduction pathways from a Trichosporiella species: G. Erkel; FEBS Lett. **477,** 219 (2000) ▪ Trichodion, a new bioactive pyrone from a Trichosporiella species: G. Erkel, et al.; J. Antibiot. (Tokyo) **53,** 1401 (2000)



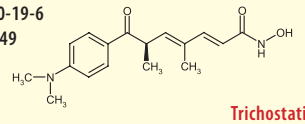
Trichodion

Trichostatin A [TSA]

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

Antibiotic. 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. May induce apoptosis in some cases. Induces acetylation of histone-3/4 and expression of p300.

CAS: 58880-19-6
MI: **14:** 9649



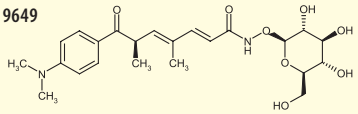
Trichostatin A

Trichostatin C [Antibiotic 145-A]

ALX-380-239-MC05 0.5 mg

Isolated from *Streptomyces sp.* MST-AS5346. Analog of trichostatin A (Prod. No. ALX-380-068). Induces acetylation of histone H4. Shows antifungal activity.

CAS: 68676-88-0
MI: **14:** 9649



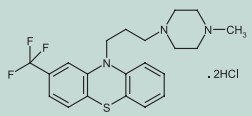
Trichostatin C

Trifluoperazine . 2HCl

ALX-550-310-G001 1 g
ALX-550-310-G005 5 g

Calmodulin inhibitor. Antipsychotic and sedative dopamine antagonist. Potent and irreversible inhibitor of cAMP-gated cationic channels. Inhibits DNA repair.

CAS: 440-17-5
MI: **14:** 9680



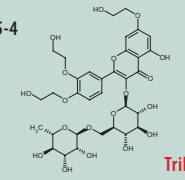
Trifluoperazine . 2HCl

Trihydroxyethylrutin [Troxerutin]

ALX-385-030-G005 5 g
ALX-385-030-G025 25 g

Isolated from *Sophora japonica L.* Flavonoid derivative. Vaso- and cardioprotective agent used clinically to treat venous disorders. Inhibits platelet aggregation. Protects biomembranes and DNA against the deleterious effects of γ-radiation. Free radical scavenger. Antioxidant.

CAS: 7085-55-4
MI: **14:** 9789



Trihydroxyethylrutin

4′,5,7-Trihydroxyflavanone see Naringenin

4′,5,7-Trihydroxyflavone see Apigenin

5,6,7-Trihydroxyflavone see Baicalein

4′,5,7-Trihydroxyisoflavone see Genistein (synthetic)

3′,5,7-Trihydroxy-4′-methoxyflavanone see Hesperetin

***trans*-3,4′,5-Trihydroxystilbene see Resveratrol**

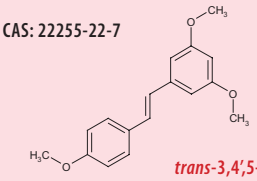
trans-3,4′,5-Trimethoxy-stilbene [Trimethoxy-resveratrol; MR-3]

ALX-350-345-M025 25 mg
ALX-350-345-M100 100 mg

Analog of resveratrol (Prod. No. ALX-270-125). Shows powerful anti-angiogenic activity.

LIT: Anti-allergic activity of stilbenes from Korean rhubarb (Rheum undulatum L.): structure requirements for inhibition of antigen-induced degranulation and their effects on the release of TNF-alpha and IL-4 in RBL-2H3 cells: H. Matsuda, et al.; Bioorg. Med. Chem. **12,** 4871 (2004) ▪ Antiangiogenic and vascular-targeting activity of the microtubule-destabilizing trans-resveratrol derivative **3,5,**4′-trimethoxystilbene: M. Belleri, et al.; Mol. Pharmacol. **67,** 1451 (2005) ▪ Synthesis and biological properties of new stilbene derivatives of resveratrol as new selective aryl hydrocarbon modulators: P. de Medina, et al.; J. Med. Chem. **48,** 287 (2005) ▪ Antitumor activity of **3,5,**4′-trimethoxystilbene in COLO 205 cells and xenografts in SCID mice: M.H. Pan, et al.; Mol. Carcinog. **Epub ahead of print,** (2007)

CAS: 22255-22-7



trans-3,4′,5-Trimethoxy-stilbene

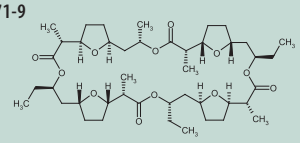
1,3,7-Trimethylxanthine see Caffeine

Trinactin [Antibiotic AKD-1D; Antibiotic S 3466B]

ALX-380-238-M001 1 mg

Isolated from *Streptomyces sp.* MST-AS5448. Ionophorous agent. Highly selective for ammonium and potassium. Immunosuppressive.

CAS: 7561-71-9



Trinactin

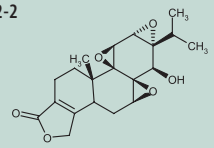
Tripterine see Celastrol

Triptolide [PG490]

ALX-350-259-M001 1 mg
ALX-350-259-M005 5 mg

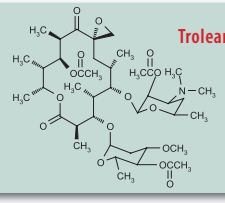
Isolated from *Tripterygium wilfordii.* Immunosuppressive agent with anti-inflammatory and antitumor properties. More effective in preventing T cell proliferation and interferon-γ production than FK506 (Prod. No. ALX-380-008). Induces apoptosis in T cells by activating DEVD cleaving caspases. Blocks TNF-α mediated induction of c-IAP1 and c-IAP2 and NF-κB activation.

CAS: 38748-32-2



Triptolide

CAS: 2751-09-9
MI: **14:** 9770



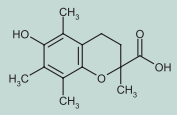
Troleandomycin

Troleandomycin [Oleandomycin triacetate ester]

ALX-380-001-G001 1 g

Semisynthetic from oleandomycin. Induces microsomal enzymes and produces an inactive cytochrome P450 Fe(II)-metabolite complex. Inhibits cytochrome P450 mediated nitric oxide (NO) release from N^G-hydroxy-L-arginine (Prod. No. ALX-106-004). Used as adjunctive therapy for the treatment of corticosteroid-dependent asthma.

CAS: 53188-07-1



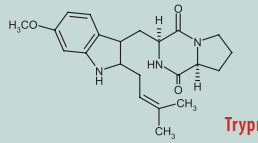
Trolox®

Trolox® [6-Hydroxy-2,5,7,8-tetramethylchroman-2-carboxylic acid]

ALX-270-267-M100 100 mg

Cell permeable derivative of vitamin E. Antioxidant. Prevents peroxynitrite-mediated oxidative stress and apoptosis in rat thymocytes.

LIT: Peroxynitrite causes DNA damage and oxidation of thiols in rat thymocytes [corrected]: M.G. Salgo, et al.; Arch. Biochem. Biophys. **322,** 500 (1995) ▪ Trolox inhibits peroxynitrite-mediated oxidative stress and apoptosis in rat thymocytes: M.G. Salgo & W.A. Pryor; Arch. Biochem. Biophys. **333,** 482 (1996)



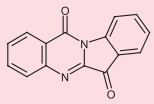
Tryprostatin A

Tryprostatin A

ALX-380-090-C500 500 µg

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

CAS: 13220-57-0



Tryptanthrin

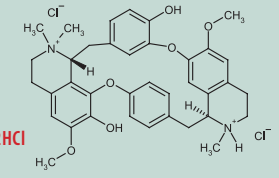
Tryptanthrin

ALX-270-360-M001 1 mg
ALX-270-360-M005 5 mg

Synthetic. Potent inhibitor of prostaglandin and leukotriene synthesis in various cell lines. Selective cyclooxygenase 2 (COX-2) inhibitor. Inhibitor of inducible nitric oxide synthase (iNOS; NOS II) expression. Inhibits the production of IFN-γ and IL-2 after stimulation of Peyer's patch lymphocytes with staphylococcal enterotoxin B (SEB). Inhibits P-glycoprotein (Pgp) (expressed by the MDR1 gene) and reverses doxorubicin (Prod. No. ALX-380-042) resistance on breast cancer cells.

LIT: H. Danz, et al.; Arch. Pharm. Suppl. I **333,** 11 (2000) ▪ Tryptanthrin inhibits nitric oxide and prostaglandin E(2) synthesis by murine macrophages: T. Ishihara, et al.; Eur. J. Pharmacol. **407,** 197 (2000) ▪ Identification and isolation of the cyclooxygenase-2 inhibitory principle in Isatis tinctoria: H. Danz, et al.; Planta Med. **67,** 411 (2001) ▪ Inhibitory activity of tryptanthrin on prostaglandin and leukotriene synthesis: H. Danz, et al.; Planta Med. **68,** 875 (2002) ▪ Tryptanthrin inhibits interferon-gamma production by Peyer's patch lymphocytes derived from mice that had been orally administered staphylococcal enterotoxin: Y. Takei, et al.; Biol. Pharm. Bull. **26,** 365 (2003) ▪ Tryptanthrin inhibits MDR1 and reverses doxorubicin resistance in breast cancer cells: S.T. Yu, et al.; BBRC **358,** 79 (2007)

CAS: 57-94-3
MI: **14:** 9807



(+)-Tubocurarine . 2HCl

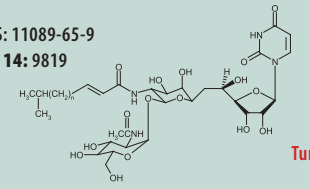
TTX see Tetrodotoxin

(+)-Tubocurarine . 2HCl

ALX-550-182-M050 50 mg

Induces neuromuscular block through interaction with acetylcholine receptor.

CAS: 11089-65-9
MI: **14:** 9819



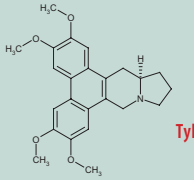
Tunicamycin

Tunicamycin

ALX-380-047-M010 10 mg
ALX-380-047-M050 50 mg

Isolated from *Streptomyces lysosuperficus.* Nucleoside antibiotic that blocks the formation of protein N-glycosidic linkages by inhibiting the transfer of N-acetylglucosamine 1-phosphate to dolichol monophosphate. Induces ER-stress following the inhibition of N-linked glycosylation.

CAS: 111408-21-0
MI: **14:** 9831



Tylophorine

Tylophorine [(-)-R-Tylophorine]

ALX-350-154-MC05 0.5 mg

Isolated from *Tylophora indica.* Phenanthroindolizidine alkaloid which shows antitumor activity. Adenylyl cyclase modulator.

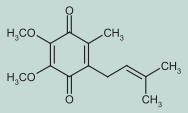
U-7984 see Decoyinine

U-22324 see Alamethicin

U-40615 see Steffimycin B

U-78548 see Borrelidin

CAS: 727-81-1



Ubiquinone-5

Ubiquinone-5 [Coenzyme Q1]

ALX-270-294-M002 2 mg

Counteracts inhibitory effects on mitochondrial permeability transition pore (MPTP) of decylubiquinone (Prod. No. ALX-270-293) and ubiquinone-10 (Prod. No. ALX-270-295).

Ubiquinone-10 [Coenzyme Q2]

ALX-270-295-M002 2 mg

Inhibitor of the mitochondrial permeability transition pore (MPTP). This inhibitory effect can be counteracted by ubiquinone-5 (Prod. No. ALX-270-294).

Decylubiquinone – For Details see Page 35

UCN-01 [7-Hydroxystaurosporine]

ALX-380-222-M001 1 mg
ALX-380-222-M005 5 mg

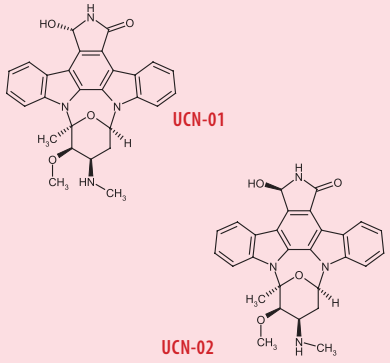
Isolated from *Streptomyces sp.* MST-AS5345. Inhibitor of protein kinase C (PKC) and cyclin-dependent kinase 2 (CDK2) resulting in accumulation of cells in the G1 phase and induction of apoptosis. Enhances the cytotoxicity of other anticancer drugs, such as DNA-damaging agents and anti-metabolite drugs through putative abrogation of G2 and/or S phase accumulation induced by these agents.

UCN-02

ALX-380-206-M001 1 mg

Isolated from *Streptomyces sp.* MST-AS5346. Inhibitor of protein kinase C (PKC) and protein kinase A (PKA). Although less selective than its isomer UCN-01 (Prod. No. ALX-380-222), UCN-02 exhibits comparable activity and probably acts by similar mechanisms.

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)



Technical Note Page 101

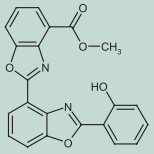
UCN-1028C see Calphostin C

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.

CAS: 151271-53-3



UK-1

Valinomycin

ALX-450-012-M005 5 mg
ALX-450-012-M025 25 mg

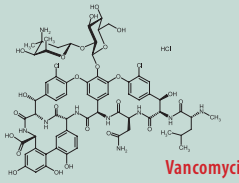
Isolated from *Streptomyces fulvissimus.* Potassium ionophore. Useful reagent for the measurement of K^+ ions by electrode-based systems. Induces apoptosis in several cell lines.

Vancomycin . HCl

ALX-380-279-M250 250 mg
ALX-380-279-G001 1 g

Antibiotic. Isolated from *Streptomyces lysosup.* Interferes with cell wall synthesis. Effective against Gram-positive bacteria.

CAS: 1404-93-9
MI: **14:** 9929



Vancomycin . HCl

N-Vanillylnonamide see Nonivamide

Venturicidin A [Aabomycin A1]

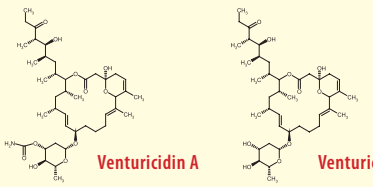
ALX-380-211-M001 1 mg

Macrolide antibiotic. Isolated from *Streptomyces sp.* MST-117594. Potent inhibitor of mitochondrial ATP synthase complex, acting on the F_0 membrane sector. Shows antifungal activity.

Venturicidin B [Aabomycin A2]

ALX-380-223-MC25 0.25 mg

For technical information and literature references see Venturicidin A (Prod. No. ALX-380-211).



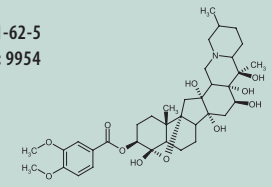
Venturicidin A Venturicidin B

Veratridine

ALX-550-307-M005 5 mg
ALX-550-307-M025 25 mg

Activates Na^+ channels. Increases intracellular Ca^{2+} levels without affecting Na^+-Ca^{2+} exchange. Acts at neurotoxin receptor site 2 and preferentially binds to activated Na^+ channels causing persistent activation. Induces cell death in bovine chromaffin cells.

CAS: 71-62-5
MI: **14:** 9954



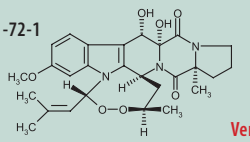
Veratridine

Verruculogen

ALX-380-056-M001 1 mg
ALX-380-056-M005 5 mg

Isolated from *Penicillium verruculosum.* Neurotoxin that acts as an inhibitor of the M phase of the mammalian cell cycle. Inhibits Ca^{2+}-activated K^+ channels. Decreases GABA levels in CNS.

CAS: 12771-72-1



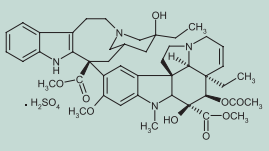
Verruculogen

Vinblastine . sulfate [VLB; Vincaleukoblastine . sulfate]

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

Semisynthetic from catharanthine or vindoline. 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.

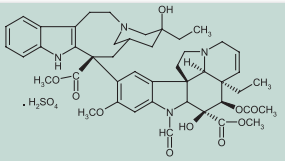
CAS: 143-67-9
MI: **14:** 9982



Vinblastine . sulfate

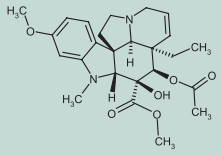
Vincamone see (-)-Eburnamonine

CAS: 2068-78-2
MI: **14:** 9986



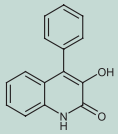
Vincristine . sulfate

CAS: 2182-14-1
MI: **14:** 9988



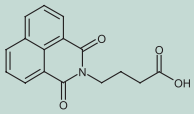
Vindoline

CAS: 129-24-8



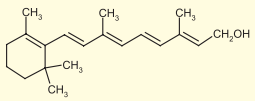
Viridicatin

CAS: 88909-96-0



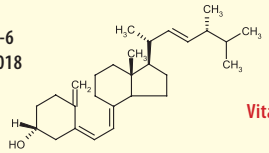
Virstatin

CAS: 68-26-8
MI: **14:** 10013



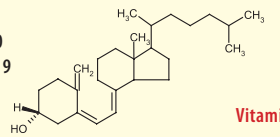
Vitamin A

CAS: 50-14-6
MI: **14:** 10018



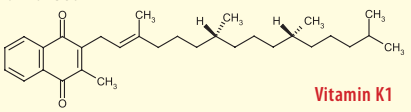
Vitamin D2

CAS: 67-97-0
MI: **14:** 10019



Vitamin D3

CAS: 84-80-0
MI: **14:** 7380



Vitamin K1

Vincristine . sulfate

[VCR . sulfate; Leukocristine . sulfate]

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

Semisynthetic from catharanthine or vindoline. 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.

Vindoline

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

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

Virenomycin M see Chrysomycin B

Virenomycin V see Chrysomycin A

Viridicatin

ALX-350-136-M001 1 mg

Antibiotic. Isolated from *Penicillium sp.* Metabolic product of *Penicillium viridicatum*. Exhibits strong antibiotic activity against *M. tuberculosis* and also against *B. subtilis, S. aureus* and *S. cerevisiae*.

Virosin see Antimycin A

Virstatin

ALX-430-147-M010 10 mg
ALX-430-147-M050 50 mg

Inhibits virulence regulation in *V. cholerae*. Prevents expression of cholera toxin and the toxin coregulated pilus (TCP) by inhibiting the transcriptional regulator ToxT. Effectively protects infant mice against TCP-dependent *V. cholerae* intestinal colonization *in vivo*. Displays little toxicity towards mammalian cells (up to 2mM for Hep2 cells).

LIT: Small-molecule inhibitor of Vibrio cholerae virulence and intestinal colonization: D.T. Hung, et al.; Science **310,** 670 (2005) ▪ Virstatin inhibits dimerization of the transcriptional activator ToxT: E. A. Shakhnovich, et al.; PNAS **104,** 2372 (2007)

Vitamin A

[Retinol (all-trans)]

ALX-460-021-G001 1 g
ALX-460-021-G005 5 g

Synthetic.

Vitamin B see Nicotinic acid

Vitamin B1 see Thiamine

Vitamin B2 see Riboflavine

Vitamin B6 see Pyridoxol

Vitamin B12

ALX-460-024-G001 1 g
ALX-460-024-G005 5 g

Synthetic.

Vitamin C see L-(+)-Ascorbic acid

Vitamin D2

[Calciferol; Ergocalciferol]

ALX-460-025-G001 1 g
ALX-460-025-G005 5 g

Synthetic.

Vitamin D3

[Cholecalciferol; Colecalciferol]

ALX-460-026-G001 1 g
ALX-460-026-G005 5 g

Synthetic.

Vitamin D3, 1α,25-Dihydroxy- see Calcitriol

Vitamin E see DL-α-Tocopherol

Vitamin H see D-(+)-Biotin

Vitamin K1

[Phytomenadione; Phylloquinone; 2-Methyl-3-phytyl-1,4-naphthoquinone]

ALX-460-027-G005 5 g

Synthetic.

Vitamin P see Rutin

Vitamin PP see Nicotinamide

VP-16-213 see Etoposide

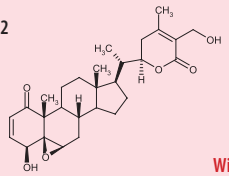
Withaferin A

ALX-350-153-M001 1 mg
ALX-350-153-M005 5 mg

Isolated from *Withania somnifera*. Cell permeable and potent angiogenesis inhibitor from the family of withanolides. Inhibits endothelial cells (HUVEC) sprouting *in vitro* and *in vivo*. Exhibits antitumor, anti-inflammatory, radiosensitizing, and immunosuppressive properties. Potently inhibits NFκB activation by preventing the TNF-induced activation of IκB kinase β (IKKβ). Affects AP-1 transcription and induces cell death. Alters cytoskeletal architecture by covalently binding annexin II and stimulating its basal F-actin cross-linking activity which inhibits the migratory and invasive capability of endothelial cells. Targets the intermediate filament protein vimentin. Displays neuronal regenerative properties.

LIT: Tumor inhibitors. XXXIX. Active principles of Acnistus arborescens. Isolation and structural and spectral studies of withaferin A and withacnistin: S.M. Kupchan, et al.; JOC **34,** 3858 (1969) ▪ In vivo growth inhibitory and radiosensitizing effects of withaferin A on mouse Ehrlich ascites carcinoma: P.U. Devi, et al.; Cancer Lett. **95,** 189 (1995) ▪ Growth inhibition of human tumor cell lines by withanolides from Withania somnifera leaves: B. Jayaprakasam, et al.; Life Sci. **74,** 125 (2003) ▪ Withaferin A is a potent inhibitor of angiogenesis: R. Mohan, et al.; Angiogenesis **7,** 115 (2004) ▪ Neuritic regeneration and synaptic reconstruction induced by withanolide: A: T. Kuboyama, et al.; Br. J. Pharmacol. **144,** 961 (2005) ▪ Actin microfilament aggregation induced by withaferin A is mediated by annexin II: R.R. Falsey, et al.; Nat. Chem. Biol. **2,** 33 (2006) ▪ Withaferin a strongly elicits IkappaB kinase beta hyperphosphorylation concomitant with potent inhibition of its kinase activity: M. Kaileh, et al.; J. Biol. Chem. **282,** 4253 (2007)

CAS: 5119-48-2
MI: **14:** 10048



Withaferin A

Wogonin

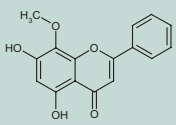
[5,7-Dihydroxy-8-methoxyflavone]

ALX-385-033-M005 5 mg
ALX-385-033-M025 25 mg

Isolated from *Scutellaria baicalensis*. Cell permeable and orally available flavonoid. Induces apoptosis in tumor cells but not in healthy cells by increasing peroxide production. Displays anti-inflammatory properties. Suppresses the release of nitric oxide (NO) by inducible nitric oxide synthase (iNOS; NOS II), PGE2 by cyclooxygenase-2 (COX-2), proinflammatory cytokines, MCP-1 gene expression and NF-κB activation.

LIT: Chinese herbal remedy wogonin inhibits monocyte chemotactic protein-1 gene expression in human endothelial cells: Y.L. Chang, et al.; Mol. Pharmacol. **60,** 507 (2001) ▪ Anti-inflammatory plant flavonoids and cellular action mechanisms: H.P. Kim, et al.; J. Pharmacol. Sci. **96,** 229 (2004) ▪ Wogonin sensitizes resistant malignant cells to TNFalpha- and TRAIL-induced apoptosis: S.C. Fas, et al.; Blood **108,** 3700 (2006) ▪ Wogonin suppresses TNF-alpha-induced MMP-9 expression by blocking the NF-kappaB activation via MAPK signaling pathways in human aortic smooth muscle cells: S.O. Lee, et al.; BBRC **351,** 118 (2006) ▪ Wogonin preferentially kills malignant lymphocytes and suppresses T-cell tumor growth by inducing PLC{gamma}1- and Ca2+-dependent apoptosis: S. Baumann, et al.; Blood **111,** 2354 (2007) ▪ Wogonin prevents glucocorticoid-induced thymocyte apoptosis without diminishing its anti-inflammatory action: R. Enomoto, et al.; J. Pharmacol. Sci. **104,** 355 (2007)

CAS: 632-85-9



Wogonin

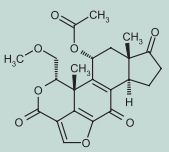
Wortmannin

[KY 12420] Bulk

ALX-350-020-M001 1 mg
ALX-350-020-M005 5 mg
ALX-350-020-M025 25 mg

Isolated from *Talaromyces wortmannin* KY 12420. Potent and specific inhibitor of phosphoinositide 3-kinase (PI(3)K), myosin light chain kinase and of neutrophil and formyl-Met-Leu-Phe-mediated phospholipase D activation. Strongly inhibits autophagy (proteolysis). Markedly potentiates the LPS-induced nitric oxide (NO) production from macrophages. Induces *in vivo* Alzheimer-like hyperphosphorylation in tau.

CAS: 19545-26-7
MI: **14:** 10053



Wortmannin

WP631 . 2HCl

[Desmethylalborixin]

ALX-380-064-C100 100 µg
ALX-380-064-M001 1 mg

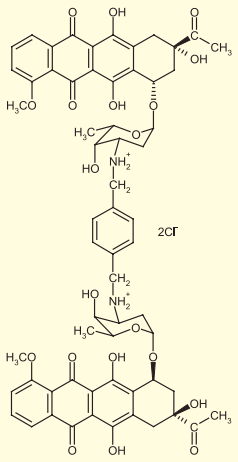
Synthetic fluorescent bisintercalating anthracycline antibiotic with ultratight binding properties to DNA. Inhibits Sp1-initiated transcription at nanomolar concentrations. Appears to overcome MRP-mediated multidrug resistance. Induces apoptosis.

Licenced product covered by US Patent 5,874,412. Sold with permission of Houston Pharmaceuticals, Inc.

WP631 . dimethanesulfonate

ALX-380-074-C500 500 µg

For technical information see product WP631 . 2HCl (Prod. No. ALX-380-064).



WP631 . 2HCl

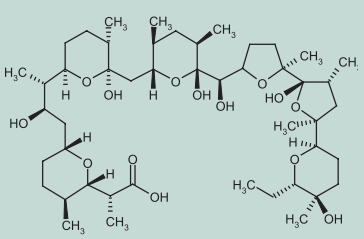
X-206

ALX-380-087-M001 1 mg
ALX-380-087-M005 5 mg

Isolated from *Streptomyces sp.* Ionophoric. Chelates monovalent cations, preferably sodium ions and transports them passively through biological membranes. Displays antimicrobial and cytotoxic properties and selective and potent antimalarial activity.

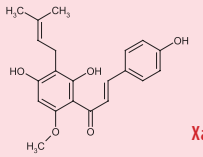
LIT: Potent antimalarial activities of polyether antibiotic, X-206: K. Otoguro, et al.; J. Antibiot. (Tokyo) **54,** 658 (2001)

CAS: 36505-48-3



X-206

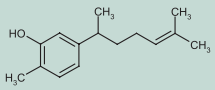
CAS: 6754-58-1



Xanthohumol

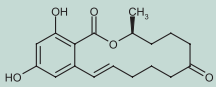
Technical Note Page 106

CAS: 30199-26-9



Xanthorrhizol

CAS: 17924-92-4
MI: **14:** 10116



Zearalenone

Technical Note Page 111

Xanthohumol

Bulk

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. Inhibits the expression of HIF-1α and VEGF under hypoxic conditions. Induces apoptosis in mature adipocytes.

LIT: Xanthohumols, diacylglycerol acyltransferase inhibitors, from Humulus lupulus: N. Tabata, et al.; Phytochemistry **46,** 683 (1997) ▪ Antiproliferative and cytotoxic effects of prenylated flavonoids from hops (Humulus lupulus) in human cancer cell lines: C.L. Miranda, et al.; Food Chem. Toxicol. **37,** 271 (1999) ▪ Prenylated chalcones and flavanones as inducers of quinone reductase in mouse Hepa 1c1c7 cells: C.L. Miranda, et al.; Cancer Lett. **149,** 21 (2000) ▪ In vitro inhibition of human P450 enzymes by prenylated flavonoids from hops, Humulus lupulus: M.C. Henderson, et al.; Xenobiotica **30,** 235 (2000) ▪ Cancer chemopreventive activity of Xanthohumol, a natural product derived from hop: C. Gerhauser, et al.; Mol. Cancer Ther. **1,** 959 (2002) ▪ Xanthohumol and related prenylflavonoids from hops and beer: to your good health!: J.F. Stevens & J.E. Page; Phytochemistry **65,** 1317 (2004) (Review) ▪ Effect of xanthohumol and isoxanthohumol on 3T3-L1 cell apoptosis and adipogenesis: J.Y. Yang, et al.; Apoptosis **12,** 1953 (2007)

Xanthohumol, Iso- see Isoxanthohumol

Xanthorrhizol

ALX-350-263-M001 1 mg

Isolated from *Curcuma xanthorrhiza.* Antibacterial and anti-inflammatory compound. Apoptosis inducer.

LIT: Effect of xanthorrhizol, xanthorrhizol glycoside and trachylobanoic acid isolated from Cachani complex plants upon the contractile activity of uterine smooth muscle: H. Ponce-Monter, et al.; Phytother. Res. **13,** 202 (1999) ▪ Xanthorrhizol: a potential antibacterial agent from Curcuma xanthorrhiza against Streptococcus mutans: J.K. Hwang, et al.; Planta Med. **66,** 196 (2000) ▪ Xanthorrhizol induces apoptosis via the up-regulation of bax and p53 in HeLa cells: N. Ismail, et al.; Anticancer Res. **25,** 2221 (2005) ▪ Regulation of p53-, Bcl-2- and caspase-dependent signaling pathway in xanthorrhizol-induced apoptosis of HepG2 hepatoma cells: T. Handayani, et al.; Anticancer Res. **27,** 965 (2007) ▪ Xanthorrhizol inhibits 12-O-tetradecanoylphorbol-13-acetate-induced acute inflammation and two-stage mouse skin carcinogenesis by blocking the expression of ornithine decarboxylase, cyclooxygenase-2 and inducible nitric oxide synthase through mitogen-acti: W.Y. Chung, et al.; Carcinogenesis **28,** 1224 (2007)

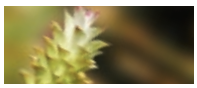
XK-213 see Echinosporin

Zearalenone

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

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

Technical Notes


Curcumin Page 86

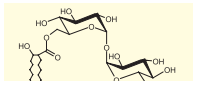

Ecdysteroids Page 87


Microcystins [Toxins from Cyanobacteria] Page 88 – 90

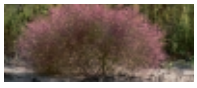

Epigallocatechin gallate [EGCG] Page 91


Leptomycins Page 92 – 93


LPS [Lipopolysaccharides] & Lipid A Page 94 – 95


Cord Factor [Trehalose 6,6'-dimycolate] Page 95


Madindoline A Page 96


Compound A Page 96


Rocaglamides Page 97


Bufadienolides Page 97


Geldanamycin & Related Products Page 98


Floxacins Page 99


Staurosporine & Related Products Page 100 – 101


Becatecarin Page 102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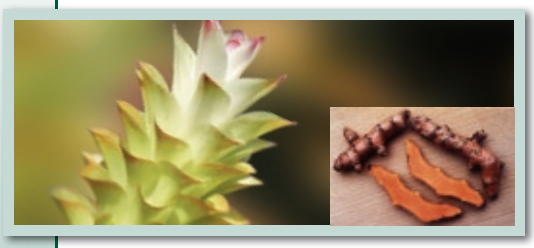
Active Substances from Fruits and Vegetables Page 103 – 108


Mycotoxins Page 109 – 111



Curcumin

[Diferuloylmethane]

Curcuminoids, a group of phenolic compounds isolated from the roots of *Curcuma longa (Zingiberaceae)*, exhibit a variety of beneficial effects on health and events that help in preventing certain diseases. A majority of these studies were carried out with curcumin (diferuloylmethane), which is a major curcuminoid. The traditional uses of curcuminoids in folk medicine are multiple and some of these therapeutic effects have been confirmed by scientific research. As a result of extensive research on the therapeutic properties of curcumin, some understanding on the cellular, molecular and biochemical mechanisms of action of curcumin is emerging (Figure). Curcumin has been shown to attack multiple molecular targets including growth factors and receptors, transcription factors, cytokines, enzymes and genes regulating apoptosis. The nuclear transcription factor NF-κB is a key molecular target of curcumin. Curcumin inhibits the degradation of IκBα and subsequently inactivates NF-κB. NF-κB is crucial to innate and adaptive immunity and plays an important role in inflammation, apoptosis, angiogenesis, autoimmune diseases and cancer.

Curcumin (high purity)

[1,7-*bis*(4-Hydroxy-3-methoxyphenyl)-1,6-heptadiene-3,5-dione; Diferuloylmethane]

ALX-350-028-M010	10 mg
ALX-350-028-M050	50 mg
ALX-350-028-M250	250 mg

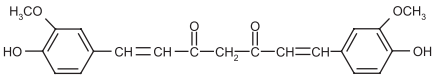
CAS NUMBER: 458-37-7

SOURCE/HOST: Isolated from turmeric *(Curcuma longa)*.

PURITY: ≥98.5% (Note: This highly purified product does not contain 30-40% bioactive impurities)

SOLUBILITY: Soluble in acetic acid or 100% ethanol.

LIT: For a comprehensive bibliography please visit our website.



Latest Insight

Curcumin possesses histone acetyltransferase (HAT) inhibitory activity with specificity for the p300/CREB-binding protein. Recently, T. Morimoto, et al., showed that curcumin inhibited the hypertrophy-induced acetylation and DNA-binding abilities of GATA4, a hypertrophy-responsive transcription factor, in rat cardiomyocytes. Curcumin also disrupted the p300/GATA4 complex and repressed agonist and p300-induced hypertrophic responses in these cells. Both the acetylated form of GATA4 and the relative levels of the p300/GATA4 complex markedly increased in rat hypertensive hearts *in vivo*. Therefore, inhibition of p300 HAT activity by the nontoxic dietary compound curcumin may provide a novel therapeutic strategy for heart failure in humans.

LIT: The dietary compound curcumin inhibits p300 histone acetyltransferase activity and prevents heart failure in rats: T. Morimoto, et al.; J. Clin. Invest. **118,** 868 (2008)

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Modification of certain inflammation-induced biochemical changes by curcumin: R. Srivastava & R.C. Srimal; Indian J. Med. Res. **81,** 215 (1985) ▪ Inhibition of 5-hydroxy-eicosatetraenoic acid (5-HETE) formation in intact human neutrophils by naturally-occurring diarylheptanoids: inhibitory activities of curcuminoids and yakuchinones: D.L. Flynn, et al.; Prostagl. Leukotr. Med. **22,** 357 (1986) ▪ Inhibitory effect of curcumin on epidermal growth factor receptor kinase activity in A431 cells: L. Korutla & R. Kumar; Biochim. Biophys. Acta **1224,** 597 (1994) ▪ Curcumin, an anti-tumour promoter and anti-inflammatory agent, inhibits induction of nitric oxide synthase in activated macrophages: I. Brouet & H. Okshima; BBRC **206,** 533 (1995) ▪ Cytotoxicity and cytoprotective activities of natural compounds. The case of curcumin: J.N. Commandeur & N.P. Vermeulen; Xenobiotica **26,** 667 (1996) ▪ Nitric oxide scavenging by curcuminoids: Sreejayan & M.N. Rao; J. Pharm. Pharmacol. **49,** 105 (1997) ▪ Inhibitory effects of curcumin on tumorigenesis in mice: M.T. Huang, et al.; J. Cell. Biochem. (Suppl.) **27,** 26 (1997) ▪ In vivo inhibition of nitric oxide synthase gene expression by curcumin, a cancer preventive natural product with anti-inflammatory properties: M.M. Chan, et al.; Biochem. Pharmacol. **55,** 1955 (1998) ▪ Effect of curcumin on the production of nitric oxide by cultured rat mammary gland: M. Onoda & H. Inano; Nitric Oxide **4,** 505 (2000) ▪ Suppression of nitric oxide oxidation to nitrite by curcumin is due to the sequestration of the reaction intermediate nitrogen dioxide, not nitric oxide: B.D. Johnston & E.G. DeMaster; Nitric Oxide **8,** 231 (2003) ▪ Biological properties of curcumin-cellular and molecular mechanisms of action: B. Joe, et al.; Crit. Rev. Food Sci. Nutr. **44,** 97 (2004) (Review) ▪ Curcumin, a major constituent of turmeric, corrects cystic fibrosis defects: M.E. Egan, et al.; Science **304,** 600 (2004) ▪ Inhibition of NAD(P)H:quinone oxidoreductase 1 activity and induction of p53 degradation by the natural phenolic compound curcumin: P. Tsvetkov, et al.; PNAS **102,** 5535 (2005) ▪ Immunomodulatory effects of curcumin: V.S. Yadav, et al.; Immunopharmacol. Immunotoxicol. **27,** 485 (2005) ▪ Curcumin, an atoxic antioxidant and natural NFkappaB, cyclooxygenase-2, lipooxygenase, and inducible nitric oxide synthase inhibitor: a shield against acute and chronic diseases: S. Bengmark; JPEN J. Parenter. Enteral. Nutr. **30,** 45 (2006) (Review) ▪ Curcumin is an inhibitor of p300 histone acetyltransferase: M.G. Marcu, et al.; Med. Chem. **2,** 169 (2006) ▪ Multiple biological activities of curcumin: a short review: R.K. Maheshwari, et al.; Life Sci. **78,** 2081 (2006) (Review) ▪ Curcumin inhibits hypoxia-induced angiogenesis via down-regulation of HIF-1: M.K. Bae, et al.; Oncol. Rep. **15,** 1557 (2006) ▪ Notch-1 down-regulation by curcumin is associated with the inhibition of cell growth and the induction of apoptosis in pancreatic cancer cells: Z. Wang, et al.; Cancer **106,** 2503 (2006) ▪ Curcumin improves wound healing by modulating collagen and decreasing reactive oxygen species: M. Panchatcharam, et al.; Mol. Cell Biochem. **290,** 87 (2006) ▪ Inhibitory effect of curcumin on nitric oxide production from lipopolysaccharide-activated primary microglia: K.K. Jung, et al.; Life Sci. **79,** 2022 (2006)

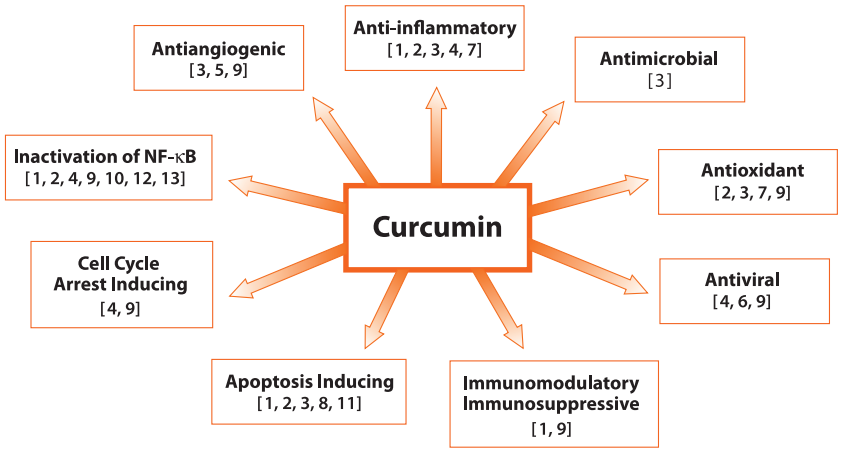

FIGURE: Cellular, Molecular & Biochemical Actions of Curcumin.

LIT: [1] „Spicing up" of the immune system by curcumin: G.C. Jagetia & B.B. Aggarwal; J. Clin. Immunol. **27,** 19 (2007) ▪ [2] Multiple molecular targets in cancer chemoprevention by curcumin: R.L. Thangapazham, et al.; AAPS J. **8,** E443 (2006) ▪ [3] Multiple biological activities of curcumin: R.K. Maheseari, et al.; Life Sci. **78,** 2081 (2006) ▪ [4] Biological properties of curcumin - cellular and molecular mechanisms of action: B. Joe, et al.; Crit. Rev. Food Sci. Nutr. **44,** 97 (2004) ▪ [5] Curcumin as an inhibitor of angiogenesis: S.S. Bhandarkar & J.L Arbiser; Adv. Exp. Med. Biol. **595,** 185 (2007) ▪ [6] Modulation of transcription factors by curcumin: S. Shishodia, et al.; Adv. Exp. Med. Biol. **595,** 127 (2007) ▪ [7] Antioxidant and anti-inflammatory properties of curcumin; V.P. Menon & A.R. Sudherr; Adv. Exp. Med. Biol. **595,** 105 (2007) ▪ [8] Induction of apoptosis by curcumin and its implications for cancer therapy: D. Karunagaran, et al.; Curr. Cancer Drug Targets **5,** 117 (2005) ▪ [9] Curcumin - biological and medicinal properties: B.B. Aggarwal, et al.; Tumeric: The genus Curcuma, 297 (2006) ▪ [10] Modulation of human multidrug-resistance MDR-1 gene by natural curcuminoids: P. Limtrakul, et al.; BMC Cancer **4,** 1 (2006) ▪ [11] Curcumin induces pro-apoptotic endoplasmic reticulum stress in human leukemia HL-60 cells: H.O. Pae, et al.; BBRC **353,** 1040 (2007) ▪ [12] Activation of transcription factor NF-kappaB is suppressed by curcumin (diferuloylmethane): S. Singh & B.B. Aggarwal; J. Biol. Chem. **270,** 24995 (1995) ▪ [13] Molecular targets of curcumin: J.K. Lin; Adv. Exp. Med. Biol. **595,** 227 (2007)

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 MurA 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.

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Ecdysone

[α-Ecdysone]

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

20-Hydroxyecdysone

[β-Ecdysone; Ecdysterone]

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

Makisterone A

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

Muristerone A

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

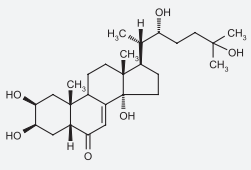
Step up to the Source™

Ponasterone A

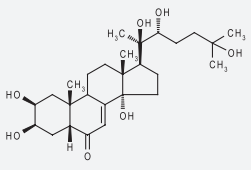
[25-Deoxy-20-hydroxyecdysone; 25-Deoxy-ecdysterone]

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

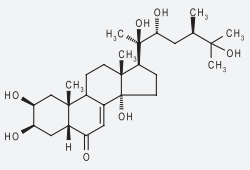
For BULK quantities please inquire!



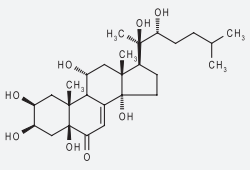
Ecdysone



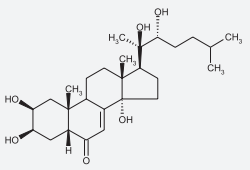
20-Hydroxyecdysone



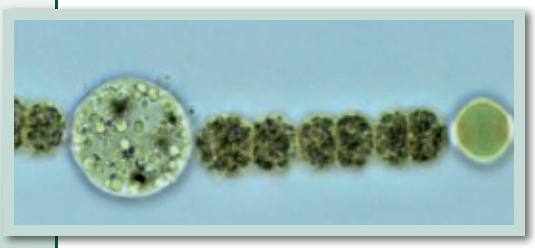
Makisterone A



Muristerone A



Ponasterone A



Toxins from Cyanobacteria – Microcystins

Cyanobacteria (blue-green algae) are a diverse group of photo-autotrophic organisms which are found in terrestrial and aquatic environments. They are an essential component of the food chain in many ecosystems, however, they can often form dense scums or blooms which have been shown to be hazardous to humans and animals. Routes of exposure may be via direct ingestion or inhalation during recreation, bathing or irrigation, whereas, indirect exposure is most likely to occur via ingestion of contaminated drinking water, vegetables or fish/shellfish. The apparent increase in the occurrence of blooms and associated toxic events has been associated with eutrophication and global warming. The ecological function of cyanobacterial toxins remains under investigation. The toxic mechanisms to vertebrates are used to classify them into hepatotoxins (microcystins and nodularins), neurotoxins (anatoxin and saxitoxins), cytotoxins (cylindrospermopsin), dermatotoxins (lyngbyatoxin), and irritant toxins (lipopolysaccharide endotoxins). The microcystins are the most commonly encountered cyanotoxins and it is obvious that the detection of microcystins is a crucial factor of major public interest. Many regulatory authorities are now setting guidelines and accepted levels for drinking water/recreational water, etc. monitoring programs. Additional concern on the occurrence and importance of cyanobacterial toxins is reflected by inclusion in the US Environmental Protection Agency (USEPA) drinking water contaminant list and by appearing in major reviews along with chemical warfare agents [1].

Microcystins

Microcystins comprises a group of toxic, cyclic heptapeptides produced by several genera of cyanobacteria, most commonly, *Microcystis, Anabaena and Planktothrix*. They are characterized by a unique (2S,3S,8S,9S)-3-amino-9-methoxy-2,6,8-trimethyl-10-phenyldeca-4,6-dienoic acid (Adda) as shown in the general structure in Figure 2. Variation of amino acids at positions 2 and 4 (X and Z) provide the basis for microcystin nomenclature, for example, microcystin-LR has leucine (L) at position 2 and arginine (R) at position 4. Other variants are characterized by minor modifications such as methylation. The number of variants/congeners is over 70, creating a challenge for selection/development of robust methods for their detection.

Microcystins – Molecular Mechanism

Microcystins are potent inhibitors of the serine/threonine protein phosphatases type 1 (PP1) and 2A (PP2A) [2, 3], mediated through the Adda domain (Figure 1). PP1 and PP2A are two major protein phosphatases in eukaryotic cells which have been shown to be important in tumor suppression. PP2A is inhibited 1000-fold less potently, while six other phosphatases are unaffected. These results are strikingly similar to those obtained with the tumor promoter okadaic acid. The action of microcystin in inhibiting such enzymes might suggest that they act as tumor promoters [4]. All structural congeners of microcystin act as hepatotoxins [5, 6]. After accumulated in the liver they are involved in cytoskeletal disorganization, lipid peroxidation, loss of membrane integrity, DNA fragmentation, cell blebbing, apoptosis, cellular disruption, and necrosis.

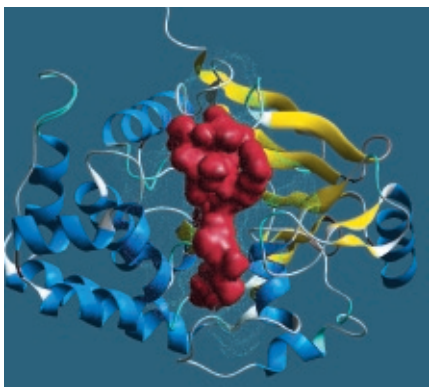


FIGURE 1: 3D-structure of microcystin-LR/PP1A-crystalline complex. *Courtesy of Prof. Marcel Jaspars, Marine Natural Products Laboratory, Department of Chemistry, University of Aberdeen.*

Microcystins – Toxicology

Microcystins have been responsible for many acute poisonings, most famously the fatal intoxication of 50 dialysis patients in Brazil in 1996, whose water was contaminated by high concentrations of microcystins [7]. Epidemiological studies have shown that long term exposure to microcystins via drinking water supplies has been associated with primary liver cancer. Potential chronic toxicity from microcystins led the WHO to establish a guideline of 1 µg/l as a maximum concentration of microcystin-LR in drinking water [8]. In 2006, microcystin-LR, was classified as a carcinogen according to the International Agency for Research on Cancer (IARC) [9].

Nodularin & Variants Thereof

Nodularin, produced by brackish and freshwater species of *Nodularia* (most commonly *N. spumigena*), is a cyclic pentapeptide, similar to microcystin-LR, also possessing a characteristic Adda amino acid [10], but with increased water solubility. Nodularin is a potent inhibitor of the serine/threonine protein phosphatases type 1 (PP1) and 2A (PP2A) [11]. Several variants of nodularin have been characterized [12]. Whilst toxicity and mode of action of nodularin is similar to that of microcystins, a major difference is that the binding to protein phosphatases is irreversible. Nodularin is a great complimentary tool to microcystins for studying cellular processes.

Cylindrospermopsin

Cylindrospermopsin is a cyanobacterial cytotoxin comprising a tricyclic guanidine moiety combined with a hydroxymethyl uracil. It is produced by species of several genera, *Cylindrospermopsis raciborskii, Umezakia natans* and *Aphanizomenon ovalisporum*, in temperate and tropical regions and exhibits a completely different mechanism of toxicity than microcystins [13,14]. Cylindrospermopsin inhibits plant protein synthesis [15].

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Microcystin-LR – *The Standard*

ALX-350-012-C050 50 µg
ALX-350-012-C100 100 µg
ALX-350-012-C500 500 µg
ALX-350-012-M001 1 mg

Isolated from *Microcystis aeruginosa*. Heptapeptide ester hepatotoxin. Tumor promoter. Equally potent and selective inhibitor of protein phosphatase 1 (PP1) and 2A (PP2A). Has no effect on protein kinases. Is less toxic than the more hydrophobic analogs microcystin-LY, -LW and -LF. Ozonation did lead to complete loss of toxicity and toxins from contaminated samples.

LIT: Structural studies on cyanoginosins-LR, -YR, -YA, and -YM, peptide toxins from Microcystis aeruginosa: D.P. Botes et al.; JCS Perkin Trans. **I,** 2747 (1985) ▪ Nodularin, microcystin, and the configuration of Adda: K.L. Rinehart, et al.; JACS **110,** 8557 (1988) ▪ Cyanobacterial microcystin-LR is a potent and specific inhibitor of protein phosphatases 1 and 2A from both mammals and higher plants: C. MacKintosh, et al.; FEBS Lett. **264,** 187 (1990) ▪ Characterization of microcystin-LR, a potent inhibitor of type 1 and type 2A protein phosphatases: R.E. Honkanen, et al.; J. Biol. Chem. **265,** 19401 (1990) ▪ Protein phosphatase 2A is a specific protamine-kinase-inactivating phosphatase: G.D. Amick, et al.; Biochem. J. **287,** 1019 (1992) ▪ Liver tumor promotion by the cyanobacterial cyclic peptide toxin microcystin-LR: R. Nishiwaki-Matsushima, et al.; J. Cancer Res. Clin. Oncol. **118,** 420 (1992) ▪ Two significant aspects of microcystin-LR: specific binding and liver specificity: R. Nishiwaki, et al.; Cancer Lett. **83,** 283 (1994) ▪ Negative regulation of ERK and Elk by protein kinase B modulates c-Fos transcription: I. Galetic, et al.; J. Biol. Chem. **278,** 4416 (2003) ▪ **For a comprehensive bibliography please visit our website.**

Microcystin-LA

ALX-350-096-C025 25 µg
ALX-350-096-C100 100 µg

Isolated from *Microcystis aeruginosa*. Analog of microcystin-LR (Prod. No. ALX-350-012) with methyl substituted in place of Ala. Inhibits protein phosphatase 2A (PP2A) and protein phosphatase 3 (PP3) more potently than protein phosphatase 1 (PP1).

LIT: The structure of cyanoginosin-LA, a cyclic heptapeptide toxin from the cyanobacterium Microcystis aeruginosa: D.P. Botes et al.; J. Chem. Soc. **1,** 2311 (1984) ▪ Microcystin composition of an axenic clonal strain of Microcystis viridis and Microcystis viridis - containing waterblooms in Japanese freshwaters: K. Kaya & M.M. Watanabe; J. App. Phycol. **2007,** 173 (1990)

Microcystin-LF

ALX-350-081-C025 25 µg
ALX-350-081-C100 100 µg

Isolated from *Microcystis aeruginosa*. Analog of microcystin-LR (Prod. No. ALX-350-012) with Phe substituted in place of Arg. Hydrophobic and believed to be more cell permeable than other microcystins.

LIT: Extraction and high-performance liquid chromatographic method for the determination of microcystins in raw and treated waters: L.A. Lawton, et al.; Analyst **119,** 1525 (1994) ▪ First report of microcystins from a Brazilian isolate of the cyanobacterium Microcystis aeruginosa: S.M.F.O. Azevedo, et al.; J. Appl. Phycology **6,** 261 (1994) ▪ Isolation and characterization of microcystins from laboratory cultures and environmental samples of Microcystis aeruginosa and from an associated animal toxicosis: L.A. Lawton, et al.; Nat. Toxins **3,** 50 (1995)

HPLC Profile

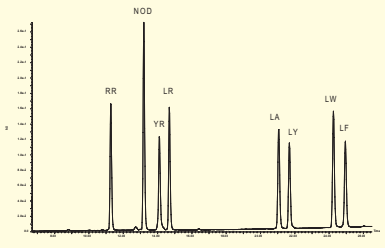


FIGURE: Microcystins/nodularin were separated by HPLC on a Waters Sunfire™ C18 column (2.1 mm ID x 150 mm long; 5 µm particle size) maintained at 40 °C. Mobile phase was Milli-Q water (A) and acetonitrile (B) both containing 0.05% TFA. Components were eluted using a linear gradient from 15% to 65% B over 25 minutes at a flow of 0.3 ml/min.

Microcystin-LW

ALX-350-080-C025 25 µg
ALX-350-080-C100 100 µg

Isolated from *Microcystis aeruginosa*. Analog of microcystin-LR (Prod. No. ALX-350-012) with Trp substituted in place of Arg. Microcystin-LW has a characteristically different absorption spectrum compared to other microcystins, making it a useful reference compound for HPLC analysis. The Trp confers an absorption maximum at 222nm, whereas most microcystins have a characteristic maximum at 239nm. Hydrophobic and believed to be more cell permeable than other microcystins. May prove useful in biochemical studies in intact cells.

LIT: Mass spectral analyses of microcystins from toxic cyanobacteria using on-line chromatographic and electrophoretic separations: K.P. Bateman, et al.; J. Chromatog. A, **712,** 253 (1995) ▪ Extraction and high-performance liquid chromatographic method for the determination of microcystins in raw and treated waters: L.A. Lawton, et al.; Analyst **119,** 1525 (1994) ▪ Isolation and characterization of microcystins from laboratory cultures and environmental samples of Microcystis aeruginosa and from an associated animal toxicosis: L.A. Lawton, et al.; Nat. Toxins **3,** 50 (1995).

Microcystin-RR

ALX-350-043-C050 50 µg
ALX-350-043-C100 100 µg
ALX-350-043-C250 250 µg
ALX-350-043-C500 500 µg
ALX-350-043-M001 1 mg

Isolated from *Microcystis aeruginosa*. Arg-Arg analog of microcystin-LR (Prod. No. ALX-350-012).Hepatotoxic, although found to be up to 10-fold less toxic than microcystin-LR on i.p. injection in mice. Potent inhibitor of protein phosphatase 2A (PP2A).

LIT: The structure of a cyclic peptide toxin, cyanogenosin-RR from Microcystis aeruginosa: P. Painuly, et al.; THL, **29**, 11 (1988) ▪ Toxicity and toxins of natural blooms and isolated strains of Microcystis spp. (Cyanobacteria) and improved procedure for purification of cultures: M. Shirai, et al.; Appl. Environ. Microbiol. **57,** 1241 (1991) ▪ Inhibition of protein phosphatases activates glucose-6-phosphatase in isolated rat hepatocytes: S. Claeyssens, et al.; FEBS Lett. **315,** 7 (1993) ▪ Extraction and high-performance liquid chromatographic method for the determination of microcystins in raw and treated waters: L.A. Lawton, et al.; Analyst **119,** 1525 (1994) ▪ Determination of some physicochemical parameters of microcystins (cyanobacterial toxins) and trace level analysis in environmental samples using liquid chromatography: C. Rivasseau, et al.; J. Chromatogr. A **799,** 155 (1998)

Microcystin-LY

ALX-350-148-C025 25 µg
ALX-350-148-C100 100 µg

Isolated from *Microcystis aeruginosa*. Analog of microcystin-LR (Prod. No. ALX-350-012) with Tyr substituted in place of Arg.

LIT: The effects of single L-amino acid substitutions on the lethal potencies of the microcystins: R.D. Stoner, et al.; Toxicon **27,** 825 (1989) ▪ Identification and characterization of microcystin-LY from Microcystis aeruginosa (strain 298): S. Rudolph-Bohner, et al.; Biol. Chem. Hoppe Seyler **374,** 635 (1993)

Microcystin-YR

ALX-350-044-C025 25 µg
ALX-350-044-C100 100 µg

Isolated from *Microcystis aeruginosa*. Analog of microcystin-LR (Prod. No. ALX-350-012) with Tyr substituted in place of Leu. As for all microcystins the conjugated double bonds in the ADDA moiety cause a characteristic absorption maximum at 238nm. The Tyr residue in position 2 of microcystin-YR confers an absorption maximum at 232nm. Useful as a reference compound in environmental analysis. The hydroxyl group of the Tyr residue may prove useful for linking microcystin-YR via conjugation to other chemicals. Potent inhibitor of eukaryotic protein phosphates 1 and 2A.

LIT: Structural studies on cyanoginosins-LR, -YR, -YA, and -YM, peptide toxins from Microcystis aeruginosa: D.P. Botes et al.; J. Chem. Soc., Perkin Transactions, I, 2747 (1985) ▪ Cyanobacteria secondary metabolites - the cyanotoxins: W.W. Carmichael; J. Appl. Bacteriol. **72,** 445 (1992) ▪ Characterization of natural toxins with inhibitory activity against serine/threonine protein phosphatases: R.E. Honkanen, et al.; Toxicon **32,** 339 (1994) ▪ Extraction and high-performance liquid chromatographic method for the determination of microcystins in raw and treated waters: L.A. Lawton, et al.; Analyst **119,** 1525 (1994) ▪ Isolation and characterization of microcystins from laboratory cultures and environmental samples of Microcystis aeruginosa and from an associated animal toxicosis: L.A. Lawton, et al.; Nat. Toxins **3,** 50 (1995) ▪ The cyanotoxins: W.W. Carmichael; Adv. Bot. Res. **27,** 211 (1997) ▪ The toxicology of microcystins: R.M. Dawson; Toxicon **36,** 953 (1998) ▪ Molecular mechanisms underlying inhibition of protein phosphatases by marine toxins: J.F. Dawson and C.F. Holmes; Front. Biosci. **4,** D646 (1999) ▪ Isolation and detection of microcystins and nodularins, cyanobacterial peptide hepatotoxins: J. Meriluoto, et al.; Methods Mol. Biol. **145,** 65 (2000) ▪ Toxicology and evaluation of microcystins: P.K. Lam, et al.; Ther. Drug. Monit. **22,** 69 (2000)

Chemical Structure of Microcystins

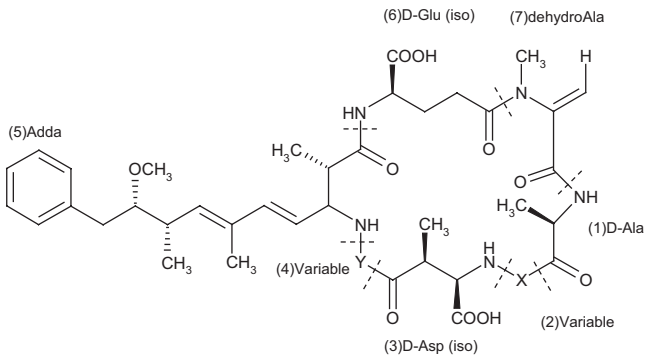


FIGURE 2

Overview on Selected Microcystin Derivatives

Prod. No.	Name	Monoisotopic Mass	MW	LD_{50} (Mouse Intraperitoneal)	Isolated from	X (2)	Y (4)
ALX-350-096	Microcystin-LA	909	910.1	50	*M. aeruginosa*	Leu	Ala
ALX-350-081	Microcystin-LF	985	986.2	toxic	*M. aeruginosa*	Leu	Phe
ALX-350-012	Microcystin-LR	994	995.2	50	*M. aeruginosa*	Leu	Arg
ALX-350-080	Microcystin-LW	1024	1025.2	not determined	*M. aeruginosa*	Leu	Trp
ALX-350-148	Microcystin-LY	1001	1002.2	90	*M. aeruginosa*	Leu	Tyr
ALX-350-043	Microcystin-RR	1037	1038.2	600	*M. aeruginosa*	Arg	Arg
ALX-350-044	Microcystin-YR Microcystin-WR	1044 1067	1045.2 1068.2	70 150-200	*M. aeruginosa* *M. species*	Tyr Trp	Arg Arg

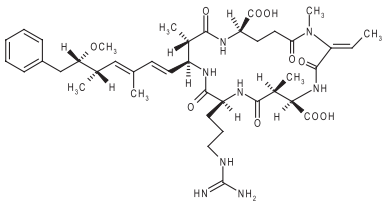
ALEXIS® BIOCHEMICALS

Other Toxins from Cyanobacteria

Nodularin

ALX-350-061-C050 50 µg
ALX-350-061-C100 100 µg
ALX-350-061-C250 250 µg
ALX-350-061-M001 1 mg

Isolated from *Nodularia spumigena*. Inhibitor of protein phosphatase 1 (PP1) (IC_{50}=1.8nM), protein phosphatase 2A (PP2A) (IC_{50}=0.026nM) and to a lesser extent protein phosphatase 2B (PP2B) (IC_{50}=8.7µm). Similar to microcystin-LR (Prod. No. ALX-350-012) but with increased water solubility.

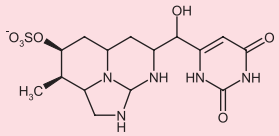


LIT: Nodularin, microcystin and the configuration of Adda: K.L. Rinehart, et al.; JACS **110,** 8557 (1988) ▪ Toxicity and partial structure of a hepatotoxic peptide produced by the cyanobacterium Nodularia spumigena Mertens emend. L575 from New Zealand: W.W. Carmichael, et al.; Appl. Environ. Microbiol. **54,** 2257 (1988) ▪ Inhibition of protein phosphatases by microcystins and nodularin associated with hepatotoxicity: S. Yoshizawa, et al.; J. Cancer Res. Clin. Oncol. **116,** 609 (1990) ▪ Rapid purification of the peptide toxins microcystin-LR and nodularin: C. Martin, et al.; FEMS Microbiol. Lett. **56,** 1 (1990) ▪ *In vitro* and *in vivo* effects of protein phosphatase inhibitors, microcystins and nodularin, on mouse skin and fibroblasts: R. Matsushima, et al.; BBRC **171,** 867 (1990) ▪ Internal surface reversed-phase high-performance liquid chromatographic separation of the cyanobacterial peptide toxins microcystin-LA, -LR, -YR, -RR and nodularin: J.A. Meriluoto, et al.; J. Chromatogr. **509,** 390 (1990) ▪ Cyanobacterial nodularin is a potent inhibitor of type 1 and type 2A protein phosphatases: R.E. Honkanen, et al.; Mol. Pharmacol. **40,** 577 (1991) ▪ Degradation of the cyanobacterial hepatotoxin, nodularin, under light and dark conditions: H. Twist & G.A. Codd; FEMS Microbiol. Lett. **151,** 83 (1997) ▪ Isolation and detection of microcystins and nodularins, cyanobacterial peptide hepatotoxins: J. Meriluoto, et al.; Methods Mol. Biol. **145,** 65 (2000) ▪ Influence of microcystin-YR and nodularin on the activity of some proteolytic enzymes in mouse liver: A. Lankoff & A. Kolataj; Toxicon **39,** 419 (2001) ▪ Nodularin-Har: a new nodularin from Nodularia: K. Saito, et al; J. Nat. Prod. **64,** 139 (2001) ▪ Detection of nodularin in flounders and cod from the Baltic Sea: V. Sipia, et al.; Environ. Toxicol. **16,** 121 (2001) ▪ **For a comprehensive bibliography please visit our website.**

NEW Cylindrospermopsin

ALX-350-149-C025 25 µg
ALX-350-149-C100 100 µg

Isolated from *Cylindrospermopsis raciborskii*. Tricyclic alkaloid cytotoxin. Exhibits a completely different mechanism of toxicity than microcystins. Protein synthesis inhibitor.



LIT: Severe hepatotoxicity caused by the tropical cyanobacterium (blue-green alga) Cylindrospermopsis raciborskii (Woloszynska) Seenaya and Subba Raju isolated from a domestic water supply reservoir: P.R. Hawkins, et al.; Appl. Environ. Microbiol. **50,** 1292 (1985) ▪ Cylindrospermopsin, a potent hepatotoxin from the blue-green alga Cylindrospermopsis raciborskii: I. Ohtani, et al.; JACS **114,** 7941 (1992) ▪ Isolation and toxicity of Cylindrospermopsis raciborskii from an ornamental lake: P.R. Hawkins, et al.; Toxicon. **35,** 341 (1997) ▪ Cylindrospermopsin, a cyanobacterial alkaloid: evaluation of its toxicologic activity: G.R. Shaw, et al.; Ther. Drug Monit. **22,** 89 (2000) ▪ Preliminary evidence for in vivo tumour initiation by oral administration of extracts of the blue-green alga cylindrospermopsis raciborskii containing the toxin cylindrospermopsin: I.R. Falconer & A.R. Humpage; Environ. Toxicol. **16,** 192 (2001) ▪ The Palm Island mystery disease 20 years on: a review of research on the cyanotoxin cylindrospermopsin: D.J. Griffiths and M.L. Saker; Environ. Toxicol. **18,** 78 (2003) ▪ The cyanobacterial toxin cylindrospermopsin inhibits pyrimidine nucleotide synthesis and alters cholesterol distribution in mice: M. Reisner, et al.; Toxicol. Sci. **82,** 620 (2004) ▪ **For a comprehensive bibliography please visit our website.**

Hepatotox Set™ 1

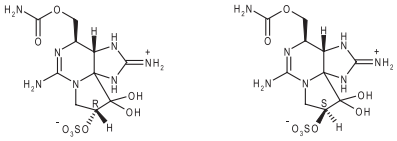
ALX-850-325-KI01 1 Set

Set of major microcystins (MC-LA (25µg); MC-LF (25µg); MC-LR (50µg); MC-LW (25µg); MC-LY (25µg); MC-PR (50µg); MC-YR (25µg) and Nodularin (50µg)).

Gonyautoxin 2/3 Epimers

ALX-350-307-C010 10 µg

Isolated from *Alexandrium tamarense*. Epimeric mixture of gonyautoxin 2 (GTX II, C-11α-hydroxysaxitoxinsulfate) and gonyautoxin 3 (GTX III, C-11β-hydroxysaxitoxinsulfate). Equally potent and selective Na^+ channel blockers. Neurotoxin.

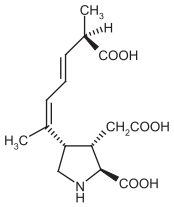


LIT: Letter: Structures of gonyautoxin II and III from the East Coast toxic dinoflagellate Gonyaulax tamarensis: Y. Shimizu, et al.; JACS **98,** 5414 (1976) ▪ Gonyautoxin associated with RNA-containing fraction in the toxic scallop digestive gland: M. Kodama, et al.; J. Biochem. **92,** 105 (1982) ▪ Structure and function of voltage-gated sodium channels: E. Marban, et al.; J. Physiol. **508 (Pt 3),** 647 (1998) ▪ Toxicokinetics and toxicodynamics of gonyautoxins after an oral toxin dose in cats: D. Andrinolo, et al.; Toxicon **40,** 699 (2002) ▪ The gonyautoxin 2/3 epimers reduces anal tone when injected in the anal sphincter of healthy adults: R. Garrido, et al.; Biol. Res. **37,** 395 (2004) ▪ Gonyautoxin: new treatment for healing acute and chronic anal fissures: R. Garrido, et al.; Dis. Colon Rectum **48,** 335 (2005)

Domoic acid

ALX-550-152-M001 1 mg

Isolated from *Nitzschia pungens f. multiseries*. Glutamate/kainate excitatory amino acid agonist with highest affinity for the kainate receptor of all known kainic acid analogs.



LIT: Structure-activity relations of excitatory amino acids on frog and rat spinal neurones: T.J. Biscoe, et al.; Br. J. Pharmacol. **58,** 373 (1976) ▪ A kainic acid receptor from frog brain purified using domoic acid affinity chromatography: D.R. Hampson & R.J. Wenthold; J. Biol. Chem. **263,** 2500 (1988) ▪ Identification of domoic acid, a neuroexcitatory amino acid, in toxic mussels from eastern Prince Edward Island: P. Wright, et al.; Can. J. Chem. **67,** 481 (1989) ▪ Domoic acid, the alleged „mussel toxin," might produce its neurotoxic effect through kainate receptor activation: an electrophysiological study in the dorsal hippocampus: G. Debonnel, et al.; Can. J. Physiol. Pharmacol. **67,** 29 (1989) ▪ Interaction of domoic acid and several derivatives with kainic acid and AMPA binding sites in rat brain: D.R. Hampson, et al.; Eur. J. Pharmacol. **218,** 1 (1992) ▪ Parenteral domoic acid impairs spatial learning in mice: B.F. Petrie, et al.; Pharmacol. Biochem. Behav. **41,** 211 (1992) ▪ **For a comprehensive bibliography please visit our website.**

Detection of Microcystins

MAb to Microcystins (Adda specific) (AD4G2)

ALX-804-585-C100 100 µg

LIT: Generic microcystin immunoassay based on monoclonal antibodies against Adda: A. Zeck, et al.; Analyst **126**, 2002 (2001) ▪ Multidimensional biochemical detection of microcystins in liquid chromatography: A. Zeck, et al.; Anal. Chem. **73,** 5509 (2001) ▪ Highly sensitive immunoassay based on a monoclonal antibody specific for [4-arginine]microcystins : A. Zeck, et al.; Anal. Chim. Acta **441,** 1 (2001) ▪ Development of a direct competitive microcystin immunoassay of broad specificity: M.G. Weller, et al.; Anal. Sci. **17,** 1445 (2005)

MAb to Microcystin-LR (MC10E7)

ALX-804-320-C200 200 µg

LIT: Highly sensitive immunoassay based on a monoclonal antibody specific for [4-arginine]microcystins: A. Zeck, et al.; Anal. Chim. Acta **441,** 1 (2001) ▪ Development of a direct competitive microcystin immunoassay of broad specificity: M.G. Weller, et al.; Anal. Sci. **17,** 1445 (2001)

Microcystins-DM ELISA Kit

ALX-850-324-KI01 1 Kit

Microcystins (Adda specific) ELISA Kit

ALX-850-319-KI01 1 Kit

LIT: Congener-independent immunoassay for microcystins and nodularins: W.J. Fischer, et al.; Environ. Sci. Technol. **35,** 4849 (2001) ▪ A review of analytical methods for assessing the public health risk from microcystin in the aquatic environment: P.R. Hawkins, et al.; J. Water Supply **54,** 509 (2005)

U.S. PATENT 6,967,240/ WOLDWIDE PATENT PCT WO 01/18059 A2

MANUFACTURED BY ABRAXIS LLC.

Epigallocatechin gallate [EGCG]

Green tea [*Camellia sinensis*, picture] is one of the most popular beverages consumed in the world and consumption of green tea has been associated with many health benefits. These benefits have been attributed to the green tea polyphenols, especially catechins. The catechins mainly consist of epicatechin, epigallocatechin, epicatechin gallate and the major component epigallocatechin-3-gallate (EGCG). EGCG was shown to have extensive cancer chemopreventive properties. Additionally, EGCG also was reported to have antibacterial, anti-HIV, anti-aging, anti-inflammatory and neuroprotective activity. It has anti-diabetic effects in animal models of insulin resistance, promotes energy expenditure and reduces obesity. Recently, it was shown that DNA and RNA served as binding targets of EGCG.

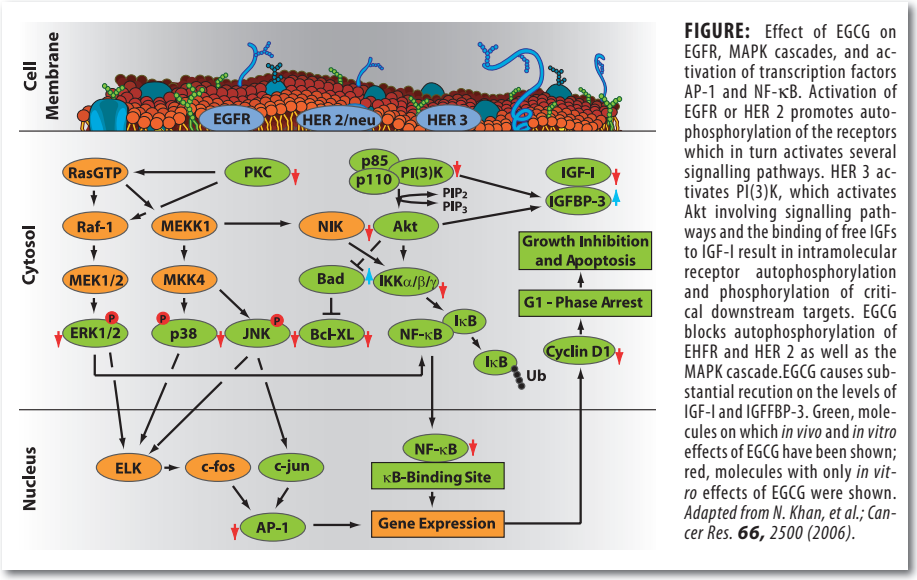


FIGURE: Effect of EGCG on EGFR, MAPK cascades, and activation of transcription factors AP-1 and NF-κB. Activation of EGFR or HER 2 promotes autophosphorylation of the receptors which in turn activates several signalling pathways. HER 3 activates PI(3)K, which activates Akt involving signalling pathways and the binding of free IGFs to IGF-I result in intramolecular receptor autophosphorylation and phosphorylation of critical downstream targets. EGCG blocks autophosphorylation of EHFR and HER 2 as well as the MAPK cascade.EGCG causes substantial recution on the levels of IGF-I and IGFFBP-3. Green, molecules on which *in vivo* and *in vitro* effects of EGCG have been shown; red, molecules with only *in vitro* effects of EGCG were shown. *Adapted from N. Khan, et al.; Cancer Res.* ***66,*** *2500 (2006).*

EGCG & Cancer

Cancer development (carcinogenesis) is a long multistage process, well-defined in three stages known as initiation, promotion, and progression. Because advanced metastasized cancers are mostly incurable, an effort to prolong or block the process of carcinogenesis through chemoprevention has become an important strategy for cancer control and management. EGCG inhibits carcinogenesis in a variety of tissues including lung, bladder, skin, small intestine, prostate and breast. It has the potential to inhibit multiple targets implicated in the initiation, promotion and progression stage of cancers.

Cancer Initiation Stage

The antioxidant EGCG neutralizes procarcinogens by inhibiting the activity of cytochrome P450 enzymes and modulating ROS through its ROS-scavenging effects.

Cancer Promotion Stage

EGCG interferes with many signalling pathway molecules and modulates cell cycle proteins, that are involved in the reversible and long-term process of the cancer promotion stage.

Intracellular Signalling Pathways (FIGURE)

- EGCG blocks the autophosphorylation of EGFR and HER2 downstream signalling pathways.
- By blocking of the autophosphorylation of EGFR and HER2, EGCG blocks phosphorylation of ERK1/2, JNK and p38.
- The NF-κB signalling pathway plays a critical role in the control of cell growth and apoptosis. EGCG was shown to down-regulate the expression of COX-2 and iNOS (NOS II) by suppressing the activity of the transcription factor NF-κB.
- EGCG inhibits AP-1 transcription, another important transcription factor in cancer development.
- EGCG inhibits VEGF expression.

Cell Cycle Modulation

- EGCG prevents cancer progession by up-regulating cyclin-dependent kinase inhibitors (CDKI), e.g. p16, p21 and p27. It also inhibits the activities of cyclin D1 and cyclin-dependent kinases (CDKs) such as CDK1 and CDK2.
- EGCG selectively inhibits the activity of topoisomerase I, which plays a role in DNA replication, transcription, and chromosome condensation in human cancer cell lines. EGCG strongly inhibits telomerase activity, and thus induces senescence, and limited life span of cancer cells, in both leukemias and solid tumors.

Cancer Progression Stage

Apoptosis and enzymes such as urokinase and MMPs play a key role during the process of cancer progression. EGCG inhibits growth of malignant cells by inducing apoptosis and inhibiting the activity of these enzymes.

- EGCG inhibits PI(3)K/Akt activation, which has an effect on Bcl-2 family proteins.
- EGCG induces apoptosis by activating caspase-8, -9 and-3 by down-regulation of Bcl-2α and Bcl-XL.
- p73 and p53 play an important role for the anticancer function of EGCG.
- EGCG inhibits urokinase plasminogen activator (uPA) which is important for its anti-invasive function of cancer.
- MMPs contribute to the maintenance of tumor growth. EGCG inhibits the activity and expression of membrane-type matrix metalloproteinase 1-MMP (MT1-MMP), a protein responsible for MMP activation.
- EGCG was shown to induce tumor cell apoptosis by blocking the catalytic activities of the 20S/26S proteasome complex.

Due to its effect on several cancer stages and targets, EGCG is a lead compound for the development of new anti-cancer compounds.

(-)-Epigallocatechin gallate [EGCG]

ALX-270-263-M010	10 mg
ALX-270-263-M050	50 mg

Related Compounds

(+)-Catechin . H_2O

ALX-385-017-G001	1 g

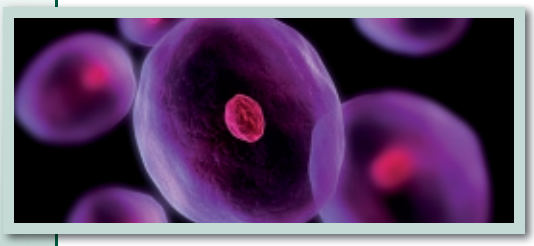
(±)-Catechin

ALX-385-002-G001	1 g

Theophylline

[1,3-Dimethylxanthine]

ALX-480-062-G005	5 g
ALX-480-062-G025	25 g



Leptomycins

Inhibitors of Nuclear-Cytoplasmic Transport

Nuclear Transport

In eukaryotic cells, the enclosure of genetic information by the nucleus allows the spatial and temporal separation of DNA replication and transcription in the nucleus from cytoplasmic protein synthesis. This compartmentalization permits a high level of regulation of these processes, but at the same time necessitates a system of selective macromolecular transport between the nucleus and cytoplasm [1, 2]. The term nuclear-cytoplasmic transport refers to the movement of a large variety of macromolecules both into and out of the nucleus. A single type of channel, the nuclear pore complex (NPC), mediates all movement across the nuclear envelope. The NPC is a massive structure, completely spanning the two membranes that separate the nucleus from the cytoplasm and housing a central 65nm long aqueous channel. Transport occurs by a variety of different pathways, defined by individual receptors and accessory soluble factors. Soluble factors selectively target substrates/cargo for import and export as well as deliver them to their appropriate intracellular destination. Macromolecules (cargo) transported through these channels include proteins and RNA, as individual entities or as part of larger complexes such as the ribosomal subunits. While small molecules such as ions and proteins of up to 60kDa can diffuse through the NPC, small proteins actively cross the NPC in a carrier-mediated fashion [3, 4]. Proteins to be imported into the nucleus contain sequences termed nuclear localization sequences (NLS), and proteins to be exported from the nucleus contain nuclear export sequences (NES). These signals are recognized by soluble factors that work with the RanGTPase cycle to coordinate import or export from nucleus [5, 6]. Protein import process: The NLS is a protein motif containing a cluster of basic residues that is recognized by soluble adapter proteins known as importins. The importin proteins, also termed karyopherins (Table 1), is one member of a conserved family of transport receptors. Each member of this conserved family recognizes a distinct NLS. Through a cascade of associations with other components within the nuclear translocation process, the importins ultimately interact with the phenylalanine-glycine (FG) repeat regions of the nucleoporins (a protein subunit of the nuclear pore complex) and with the cofactor Ran-GTP (the GTP-bound form of the RanGTPase) to discharge the cargo in the nucleus. Alternatively, an importin-independent pathway also exists. In this case, the cargos contain several HEAT-like repeats and can associate directly with the nucleo-porins [5-10]. Mechanism for nuclear export: Studies of the HIV Rev and the cellular PKI (protein kinase A inhibitor) proteins led to the discovery of the leucine-rich nuclear export signal (NES) and the very well characterized CRM1/exportin-1 (chromosome region maintenance 1) pathway of nuclear export. CRM1 is a karyopherin specific for nuclear export (exportin 1). The CRM1 protein directly binds proteins that contain a leucine-rich NES. In addition, the export mechanism appears to involve CRM1 binding to both Ranγ-GTP and nucleoporins (Figure 1) [11-14]. Nuclear-cytoplasmic transport is an important aspect of normal cell function. Defects in this process have been detected in many different types of cancer cells. These defects can occur in the signal transduction pathways that regulate the transfer of factors such as p53 and β-catenin in and out of the nucleus, or in the general nucleus import and export machinery itself [15].

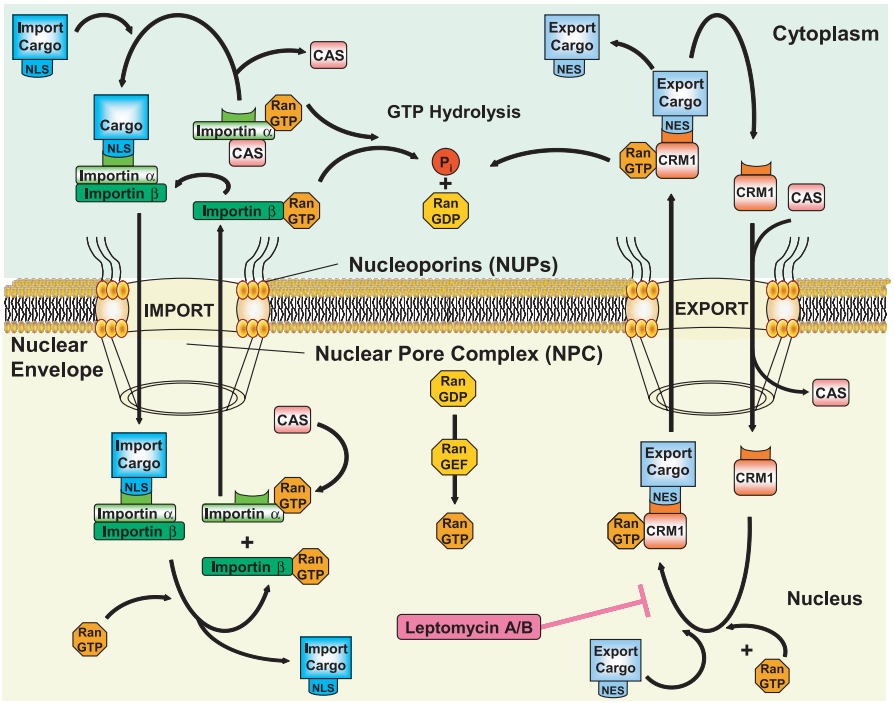


FIGURE 1: Classical nuclear-cytoplasmic transport

Import	Cargo
Importin-β1	Many Cargos,Cargos with basic NLSs via Karyopherin α, UsnRNPs via Snurportin
Karyopherin-β2	hnRNPA1, Histones, Ribosomal Proteins
Transportin SR1	SR Proteins
Transportin SR2	HuR
Importin-4	Histones, Ribosomal Proteins
Importin-5	Histones,Ribosomal Proteins
Importin-7	HIV RTC, Glucocorticoid Receptor
Importin-8	SRP19
Importin-9	Histones, Ribosomal Proteins
Importin-11	UbcM2, rpL12
Export	**Cargo**
CRM1 (Exportin-1)	Leucine rich NES Cargos
Exportin-T	tRNA
CAS	Karyopherin α
Exportin-4	eIF-5A
Exportin-5	microRNA Precursors
Exportin-6	Profilin, Actin
Exportin-7	p50Rho-GAP, 14-3-38
Import/Export	**Cargo**
Importin 13	Rbm8, Ubc9, Pax6 (import), eIF-1A (export)

TABLE 1: Human Karyopherins

Selected Review Articles

Highway to the inner nuclear membrane: rules for the road: C.P. Lusk, et al.; Nat. Rev. Mol. Cell Biol. **8,** 414 (2007) ▪ Nuclear transport: target for therapy: R.S. Faustino, et al.; Clin. Pharmacol. Ther. **81,** 880 (2007) ▪ Targeted delivery to the nucleus: C.W. Pouton, et al.; Adv. Drug Deliv. Rev. **59,** 698 (2007) ▪ The nuclear pore complex: oily spaghetti or gummy bear?: K. Weis; Cell **130,** 405 (2007) ▪ Crossing the nuclear envelope: hierarchical regulation of nucleocytoplasmic transport: L.J. Terry, et al.; Science **318,** 1412 (2007)

Leptomycin B: A Well Established Standard

Leptomycin B (LMB) is an antibiotic with anti-fungal and antitumor activity that was first discovered and purified from the fermentation broth and mycelia of *Streptomyces*. LMB ($C_{33}H_{48}O_6$) is an unsaturated, branched chain fatty acid with a terminal lactone ring (Figure 2). Later, this drug was shown to inhibit the G1 and G2 phases of the cell cycle, and other cellular functions. These pleotropic effects led to the study of the mechanisms by which leptomycin B influences intracellular processes. One of these studies involved a screen of leptomycin B resistance genes in fission yeast. In this screen it was found that leptomycin B targets CRM1 (exportin-1), a fission yeast nuclear protein, which was thought to be involved in the control of gene expression [16-19]. Leptomycin B forms a covalent complex with the sulfhydryl group of a conserved cysteine residue in CRM1, thereby inhibiting CRM1 interaction with the nuclear export signal (NES) of targeted export proteins. The ability of leptomycin B to inhibit nuclear export has made it a useful tool in the study of the subcellular localization of many regulatory proteins. Leptomycin B blocks the nuclear export of many proteins including HIV-1 Rev (the human immunodeficiency virus type 1 regulatory protein), MAPK/ERK, and NF-κB/IκB. Additionally, it also stabilizes the expression of p53 by protecting p53 from Mdm2-mediated degradation and inducing p53 transcriptional activity. Leptomycin B also inhibits the export and translation of many RNAs, including COX-2 and c-Fos mRNAs, by inhibiting export of ribonucleoproteins. Other proteins that have been shown to be influenced by leptomycin B, include actin, c-Abl, cyclin B1, MPF, PKA and many others [20-29]. Export of mRNA and certain proteins from the nucleus is a key step in protein production, proliferation, and apoptosis. Therefore, this antibiotic has become an important tool for studying nuclear localization and trafficking in eukaryotic cells.

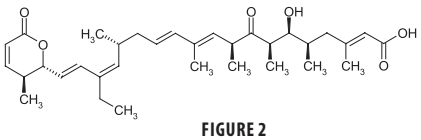


FIGURE 2

Leptomycin A: The Unexplored Alternative!

Leptomycin A (LMA) (Figure 3) is an antifungal antibiotic that inhibits nucleo-cytoplasmic translocation of Rev and MAPK/ERK, by inhibiting their export. LMA belongs to a defined panel of nuclear export inhibitors, including leptomycin and ratjadones. Although most of research done on leptomycin was done on leptomycin B, the specifications for leptomycin A indicate similiar blocking potential of the nuclear export system by leptomycin A [16-18, 30, 31]. Due to the lack of supply, leptomycin A is still unexplored.

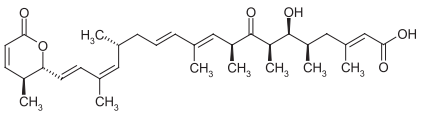


FIGURE 3

Literature References

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Leptomycin A [LMA]

ALX-380-101-C050 50 µg
ALX-380-101-C100 100 µg

Isolated from *Streptomyces sp.* Antifungal antibiotic that acts as an inhibitor of nuclear export by interacting with CRM1/exportin-1.

LIT: For a comprehensive bibliography please visit our website.

Leptomycin B [LMB]

ALX-380-100-C100 100 µg

Isolated from *Streptomyces sp.* Antifungal antibiotic that acts as an inhibitor of nuclear export by interacting with CRM1/exportin-1.

LIT: For a comprehensive bibliography please visit our website.

NEW Anguinomycin A

[5-Demethylleptomycin A]

ALX-380-202-MC01 0.1 mg

Isolated from *Streptomyces sp.* MST-AS5546. Antitumor antibiotic. Displays nanomolar cytotoxicity to murine P388 leukemia cells. Analog of leptomycin B, an inhibitor of nuclear protein export.

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 Kazusamycin A

[Hydroxyleptomycin B]

ALX-380-230-MC01 0.1 mg

Isolated from *Streptomyces sp.* MST-AS4898. Shows potent antitumor activity *in vitro* and *in vivo* against several tumor cell lines, including L1210 and P388 leukemia cells. Has antibacterial and antifungal activities. Inhibitor of nuclear export.

LIT: A new antitumor antibiotic, kazusamycin: I. Umezawa, et al.; J. Antibiot. (Tokyo) **37,** 706 (1984) ▪ Antitumor activity of a new antibiotic, kazusamycin: K. Komiyama, et al.; J. Antibiot. (Tokyo) **38,** 224 (1985) ▪ Novel antitumor antibiotics, CI-940 (PD 114,720) and PD 114,721. Taxonomy, fermentation and biological activity: J.B. Tunac, et al.; J. Antibiot. (Tokyo) **38,** 460 (1985) ▪ In vivo and in vitro anticancer activity of the structurally novel and highly potent antibiotic CI-940 and its hydroxy analog (PD 114,721): B.J. Roberts, et al.; Cancer Chemother. Pharmacol. **16,** 95 (1986) ▪ Leptomycin B is an inhibitor of nuclear export: inhibition of nucleo-cytoplasmic translocation of the human immunodeficiency virus type 1 (HIV-1) Rev protein and Rev-dependent mRNA: B. Wolff, et al.; Chem. Biol. **4,** 139 (1997)

NEW Kazusamycin B

[Hydroxyleptomycin A]

ALX-380-231-MC01 0.1 mg

Isolated from *Streptomyces sp.* MST-AS4898. Shows potent antitumor activity *in vitro* and *in vivo* against several tumor cell lines, including L1210 and P388 leukemia cells. Has antibacterial and antifungal activities. Inhibitor of nuclear export.

LIT: PD 124, 895 and PD 124, 966, two new antitumor antibiotics: T.R. Hurley, et al.; J. Antibiot. (Tokyo) **39,** 1651 (1986) ▪ Kazusamycin B, a novel antitumor antibiotic: K. Funaishi, et al.; J. Antibiot. (Tokyo) 40, 778 (1987) ▪ Antitumor effect of kazusamycin B on experimental tumors: E. Yoshida, et al.; J. Antibiot. (Tokyo) **40,** 1596 (1987) ▪ The effect of kazusamycin B on the cell cycle and morphology of cultured L1210 cells: K. Takamiya, et al.; J. Antibiot. (Tokyo) **41,** 1854 (1988) ▪ Leptomycin B is an inhibitor of nuclear export: inhibition of nucleo-cytoplasmic translocation of the human immunodeficiency virus type 1 (HIV-1) Rev protein and Rev-dependent mRNA: B. Wolff, et al.; Chem. Biol. **4,** 139 (1997)

Leptomycin Set I

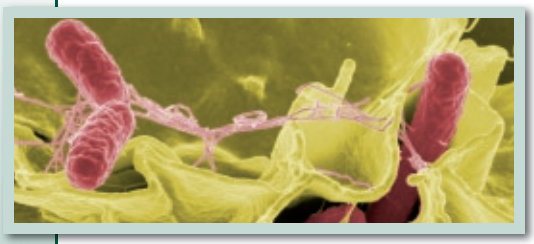
ALX-850-313-KI01 1 Set

The Set contains 1x100µg each of Leptomycin A (Prod. No. ALX-380-101) and Leptomycin B (Prod. No. ALX-380-100).

Leptomycin Set II

ALX-850-316-KI01 1 Set

The Set contains 1x100µg each of Leptomycin A (Prod. No. ALX-380-101) and Leptomycin B (Prod. No. ALX-380-100) and 1 x 5µg Ratjadone C (native) (Prod. No. ALX-270-369).



TLR*grade*™ – LPS [Lipopolysaccharide] & Lipid A Reagents

All the TLRgrade™ LPS (lipopolysaccharide) and Lipid A preparations are specific activators of Toll-like receptor (TLR) 4 and do not activate TLR2 or other TLRs as determined with splenocytes and macrophages from TLR4 deficient mice (see Figure 1).

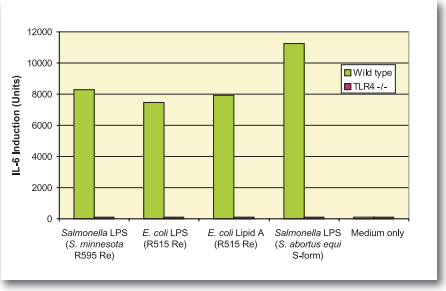


Figure 1: Activation of macrophages from TLR4 wild type compared to TLR4 deficient mice by TLR*grade*™ LPS and TLR*grade*™ Lipid A from ALEXIS® Biochemicals. Lipid A or LPS concentrations, which induced maximal activation of TLR4 wild type mouse macrophages, were also applied to TLR4 deficient mouse macrophages (105) as follows: 80ng Salmonella LPS (*S. minnesota* R595 Re), 80ng *E. coli* LPS (R515 Re), 400ng E. coli Lipid A (R515 Re) and 400ng Salmonella LPS (*S. abortus equi* S-form). 10 units of IL-6 correspond to the detection limit of the IL-6 ELISA.

TECHNICAL NOTE

Contaminated TLR Ligands

The delicate and specific recognition of different PAMPs by TLRs revealed that only the purest ligands, free of any other immunostimulatory contamination, allow to successfully elucidate the role of each TLR. While LPS was thought to not only activate TLR4 but also TLR2, repurification of commercial preparations of both *E. coli* and *Salmonella minnesota* showed that LPS no longer induces cellular activation through TLR2 [1-5]. On the other hand highly purified HSP60 [6-7] and HSP70 [8] do not stimulate TLR4 as previously reported [9]. Furthermore it has been shown that purified peptidoglycans activate Nod1 and does not involve TLR2 or TLR4 [10, 11]. Even synthetic CpG ODNs show different activation of certain immune cell subsets when highly purified (TLR*grade*™ CpG ODNs).

LIT: [1] Lipopolysaccharides (LPS) of oral black-pigmented bacteria induce tumor necrosis factor production by LPS-refractory C3H/HeJ macrophages in a way different from that of Salmonella LPS: T. Kirikae, et al.; Infect. Immun. **67,** 1736 (1999) ▪ **[2]** Repurification of lipopolysaccharide eliminates signalling through both human and murine toll-like receptor 2: M. Hirschfeld, et al.; J. Immunol. **165,** 618 (2000) ▪ **[3]** Toll-like receptor 4, but not toll-like receptor 2, is a signalling receptor for Escherichia and Salmonella lipopolysaccharides: R.I. Tapping, et al.; J. Immunol. **165,** 5780 (2000) ▪ **[4]** Two lipoproteins extracted from Escherichia coli K-12 LCD25 lipopolysaccharide are the major components responsible for Toll-like receptor 2-mediated signalling: H.K. Lee, et al.; J. Immunol. **168,** 4012 (2002) ▪ **[5]** Murein lipoprotein, peptidoglycan-associated lipoprotein, and outer membrane protein A are present in purified rough and smooth lipopolysaccharides: J. Hellman, et al.; J. Infect. Dis. **188,** 286 (2003) ▪ **[6]** Recombinant human heat shock protein 60 does not induce the release of tumor necrosis factor alpha from murine macrophages: B. Gao & M.F. Tsan; J. Biol. Chem. **278,** 22523 (2003) ▪ **[7]** Endotoxin-free heat-shock protein 70 fails to induce APC activation: H. Bausinger, et al.; Eur. J. Immunol. **32,** 3708 (2002) ▪ **[8]** Endotoxin contamination in recombinant human heat shock protein 70 (Hsp70) preparation is responsible for the induction of tumor necrosis factor alpha release by murine macrophages: B. Gao & M.F. Tsan; J. Biol. Chem. **278,** 174 (2003) ▪ **[9]** Interaction of TLR2 and TLR4 ligands with the N-terminal domain of Gp96 amplifies innate and adaptive immune responses: T. Warger, et al.; J. Biol. Chem. **281,** 22545 (2006) ▪ **[10]** Nod1 detects a unique muropeptide from gram-negative bacterial peptidoglycan: S.E. Girardin, et al.; Science **300,** 1584 (2003) ▪ **[11]** Toll-like receptor 2-dependent bacterial sensing does not occur via peptidoglycan recognition: L. H. Travassos, et al.; EMBO Rep. **5,** 1000 (2004)

Overview on LPS-forms – "R versus S"

Colony morphology is indicative of the O-glycosylation status. Wild-type bacteria form smooth colonies, synthesize "smooth" or S-form LPS that contain O-polysaccharide chains. S-form LPS also contain R-form LPS molecules in variable proportion depending on culture conditions. So-called "rough-mutants" of Gram-negative bacteria synthesize "rough" or R-form LPS. These R-forms lack the O-polysaccharide chains and the core saccharide chain may be present in different stages of completion, giving rise to defined R-classes (e.g. Ra, Rb, Rc, Rd, Re). All R-form LPS are devoid of any S-form LPS [1]. The S-form LPS are commonly the preferred choice for whole animal studies, activating TLR4-positive cells strictly dependent on the presence of membrane-anchored or soluble CD14. They also activate the TLR4/MyD88-independent pathway (TRAM/TRIF: type I IFN) and are therefore selective for classical APC expressing CD14 (e.g. monocytes, macrophages, DC) *in vivo*. The *in vivo* activity of S-form LPS may be modulated by increased levels of LBP (LPS-binding protein) during inflammation [2]. The R-form LPS and Lipid A are primarily used in cellular *in vitro* activation studies. They activate TLR4-positive cells independent of the presence of membrane-anchored or soluble CD14. They do not activate the TLR4/MyD88-independent pathway (TRAM/TRIF: type I IFN), but they also activate non-classical APC (PMN/mast cells) *in vivo*. They are very useful for *in vitro* cellular activation assays, where CD14/LBP may be absent or only available in limited amounts. A nontoxic nonpyrogenic derivative of Lipid A, is Monophosphoryl Lipid A (MPL-A) exhibiting adjuvant properties that may be used in vaccine development [3].

LIT: [1] R-form LPS, the master key to the activation ofTLR4/MD-2-positive cells: M. Huber, et al.; Eur. J. Immunol. **36,** 701 (2006) ▪ **[2]** CD14 is required for MyD88-independent LPS signaling: Z. Jiang, et al.; Nat. Immunol. **6,** 565 (2005) ▪ **[3]** Role of innate immune factors in the adjuvant activity of monophosphoryl lipid A: M. Martin, et al.; Infect. Immun. **71,** 2498 (2003)

TECHNICAL NOTE

LPS are amphipatic molecules whose hydrophobicity increases with decreasing length of the polysaccharide chain. Therefore Re class LPS and Lipid A are more hydrophobic than Ra class or S-form LPS. The use of Ca^{2+} and Mg^{2+}-free buffers is recommended for the preparation of diluted solutions in order to avoid precipitation and loss of activity for Re-LPS, Lipid A and MLP-A. For *in vivo* applications prepare solutions in glucose instead of PBS.

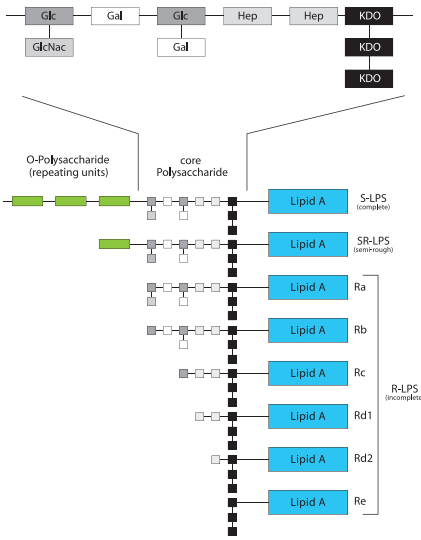


FIGURE 2: Schematic representation of the different LPS chemotypes: GlcNAc = N-AcetylglucosaMine; Glc = Glucose; Gal = Galactose; Hep = Heptose; KDO = 2-Keto-3-desoxyoctonate. Adapted from M. Huber, et al.; Eur. J. Immunol. **36,** 701 (2006) [1].

In vivo & *in vitro* Biological Properties of *Salmonella minnesota* & *E. coli* LPS

Salmonella minnesota

Product No.	LPS-form	Constituents	Mac	Dend	B Cells	PMN	Mast
ALX-581-009	S-form	O-polysaccharides-Core-Lipid A	++	++	++	+/-	+/-
ALX-581-011	S-form	O-polysaccharides-Core-Lipid A	++	++	++	+/-	+/-
ALX-581-016	R-form (Ra)	GlcNAc-Glc-Gal-(Glc-Gal)-$(Hep)_{1-2}$-Hep-$(KDO)_{2-3}$-Lipid A	++	++	+++	+++	+++
ALX-581-015	R-form (Rb)	Glc-Gal-(Glc-Gal)-$(Hep)_{1-2}$-Hep-$(KDO)_{2-3}$-Lipid A	++	++	+++	+++	+++
ALX-581-017	R-form (Rc)	Glc-$(Hep)_{1-2}$-Hep-$(KDO)_{2-3}$-Lipid A	++	++	+++	+++	+++
ALX-581-018	R-form (Rd)	Hep-$(KDO)_{2-3}$-Lipid A	++	++	+++	+++	+++
ALX-581-008	R-form (Re)	$(KDO)_{2-3}$-Lipid A	++	++	+++	+++	+++
ALX-581-201	–	Lipid A	++	++	+++	+++	+++
ALX-581-202	–	Monophosphoryl Lipid A (MPL-A)	++	++	+++	+++	+++

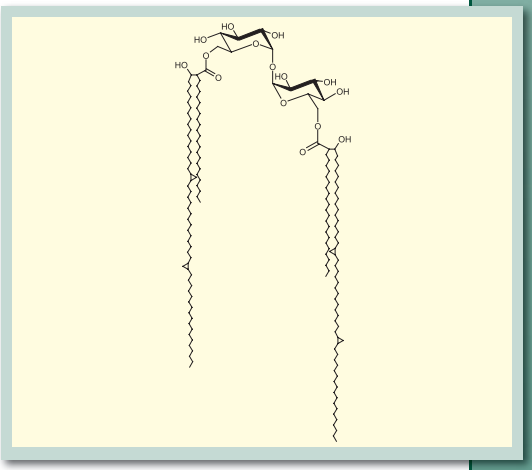
E. coli

Product No.	LPS-form	Constituents	Mac	Dend	B Cells	PMN	Mast
ALX-581-012	S-form	O-polysaccharides-Core-Lipid A	++	++	++	+/-	+/-
ALX-581-013	S-form	O-polysaccharides-Core-Lipid A	++	++	++	+/-	+/-
ALX-581-010	R-form (Ra)	Complete *E.coli*-core (type II)-Lipid A	++	++	+++	+++	+++
ALX-581-014	R-form (Rc)	Glc-$(Hep)_{1-2}$-Hep-$(KDO)_{2-3}$-Lipid A	++	++	+++	+++	+++
ALX-581-007	R-form (Re)	$(KDO)_{2-3}$-Lipid A	++	++	+++	+++	+++
ALX-581-200	–	Lipid A	++	++	+++	+++	+++

CHART LEGEND: Mac = Macrophages, Monocytes ▪ Dend = Dendritic Cells (monocyte-derived) ▪ PMN = Polymorphonuclear Leukocytes (PMN) ▪ B Cells (mouse only) ▪ Mast = Mast Cells ▪ +/- = Weak/Absent activation ▪ ++ = Strong activation ▪ +++ = Very strong activation

Cord Factor

[Trehalose 6,6'-dimycolate; TDM]



While *M. tuberculosis* or its cell wall components have been shown to activate macrophages via TLR2 and TLR4. A recent study demonstrates that cord factor-induced activation of macrophages is independent of both of these TLRs [1].

Cord factor has also been implicated in enhancing survival of mycobacteria by its ability to inhibit (auto)phagosome-lysosome fusion and trafficking events during infection [2].

Literature References

[1] In vivo activity of released cell wall lipids of Mycobacterium bovis bacillus Calmette-Guerin is due principally to trehalose mycolates: R.E. Geisel, et al.; J. Immunol. **174,** 5007 (2005) ▪ [2] Influence of trehalose 6,6'-dimycolate (TDM) during mycobacterial infection of bone marrow macrophages: J. Indrigo, et al.; Microbiology **148,** 1991 (2002)

Cord Factor (endotoxin-free *grade*)

[Trehalose 6,6'-dimycolate; TDM]

ALX-581-210-M001 1 mg

CAS NUMBER: 61512-20-7

SOURCE/HOST: Isolated from *M. tuberculosis*

PURITY: Single spot (TLC)

ENDOTOXIN CONTENT: <0.002 EU/µg (LAL test)

FORMULATION: Lyophilized

SOLUBILITY: Soluble in chloroform:methanol:water (90:10:1), hexane or isopropanol

LIT: The chemical structure of the cord factor of Mycobacterium tuberculosis: H. Noll, et al.; Biochim. Biophys. Acta **20,** 299 (1956) ▪ Development of a trehalose 6,6'-dimycolate model which explains cord formation by Mycobacterium tuberculosis: C.A. Behling, et al.; Infect. Immun. **61,** 2296 (1993) ▪ **For a comprehensive bibliography please visit our website.**

Madindoline A

A Potent Inhibitor of Interleukin-6 [IL-6]

NEW (+)–Madindoline A

[[(2R), 3aR, 8aS]-8-[4-(n-Butyl)-2,5-dimethyl-1, 3-dioxo-2-(4-cyclopentyl) methyl]-3, 3a, 8, 8a-tetrahydro-3a-hydroxy-2*H*-furo[2,3-*b*] indole]

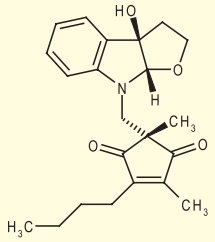
ALX-350-328-MC05 0.5 mg
ALX-350-328-M001 1 mg

FORMULA: $C_{22}H_{27}NO_4$

MW: 370.2

PURITY: ≥97%

SOLUBILITY: Soluble in methanol or 100% ethanol; insoluble in hexane.



Manufactured by The Kitasato Institute, Tokyo.

Madindolines are noncytotoxic indole alkaloids originally isolated from a fermentation broth of *Streptomyces nitrosporeus* K93-0711 [1, 2]. (+)-Madindoline A (MadA; MDL-A) and (+)-Madindoline B (MadB; MDL-B) are diastereomers with MadA being the more potent compound. MadA 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 [4]. MadA inhibits IL-6 and IL-11-induced osteoclastogenesis *in vitro* in a dose dependent manner and postmenopausal osteoporosis *in vivo*, by a mechanism different from that of 17β-estradiol [5]. IL-6 activity is known to cause various diseases such as cancer cachexia [6], Castleman's disease [7], Crohn's disease [8], rheumatoid arthritis [9], hypercalcemia [10], and multiple myeloma [11]. Madindolines are no longer available from natural sources due to mutation of the originating bacterial strain. Thus, synthetic routes have been developed to produce madindolines [12]. Recently analogs of madindolines have been synthesized as potent IL-6 inhibitors [13,14].

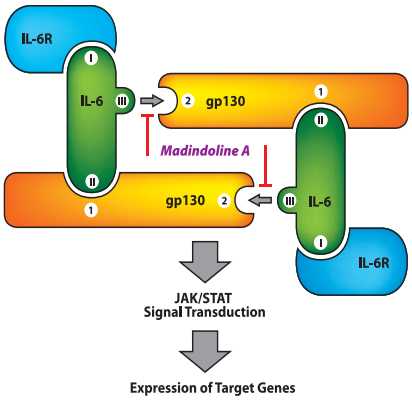
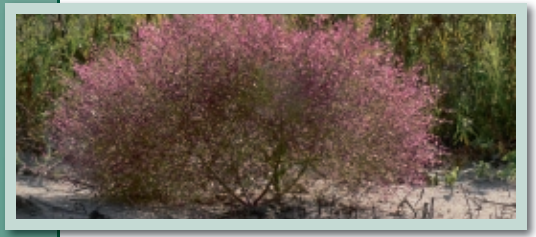


FIGURE 1: Madindoline A inhibits homodimerization of the two trimeric IL-6 / IL-6R / gp130 complexes by binding to site 2 of gp130.

Literature References

[1] 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) ▪ **[2]** 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) ▪ **[3]** Binding of madindoline A to the extracellular domain of gp130: A.Z. Saleh, et al.; Biochemistry **44,** 10822 (2005) **[4]** Association of transcription factor APRF and protein kinase Jak1 with the interleukin-6 signal transducer gp130: C. Lutticken, et al.; Science **263,** 89 (1994) ▪ **[5]** Suppression of bone resorption by madindoline A, a novel nonpeptide antagonist to gp130: M. Hayashi, et al.; PNAS **99,** 14728 (2002) ▪ **[6]** Mechanisms of experimental cancer cachexia. Local involvement of IL-1 in colon-26 tumor: G. Strassmann, et.al.; J. Immunol. **150,** 2341 (1993) **[7]** Pathogenic significance of interleukin-6 (IL-6/BSF-2) in Castleman's disease: K. Yoshizaki, et al.; Blood **74,** 1360 (1989) ▪ **[8]** Inhibition of IL-6 for the treatment of inflammatory diseases: N. Nishimoto & T. Kishimoto; Curr. Opin. Pharmacol. **4,** 386 (2004) ▪ **[9]** Blockage of interleukin-6 receptor ameliorates joint disease in murine collagen-induced arthritis: N. Takagi, et al.; Arthritis Rheum. **41,** 2117 (1998) ▪ **[10]** Interleukin-6 enhances hypercalcemia and bone resorption mediated by parathyroid hormone-related protein in vivo: J. de la Mata, et al.; J. Clin. Invest. **95,** 2846 (1995) ▪ **[11]** Granulocyte-macrophage colony-stimulating factor synergizes with interleukin-6 in supporting the proliferation of human myeloma cells: X.G. Zhang, et al.; Blood **76,** 2599 (1990) ▪ **[12]** Synthesis of (+)-madindoline A and (+)-madindoline B: L. Wan & M.A. Tius; Org. Lett. **9,** 647 (2007) ▪ **[13]** Design, synthesis, and biological activities of madindoline analogues: D. Yamamoto, et al.; Bioorg. Med. Chem. Lett. **16,** 2807 (2006) ▪ **[14]** Efficient total synthesis of novel bioactive microbial metabolites: T. Sunazuka, et al.; Acc. Chem. Res. **41,** 302 (2008)



Compound A

A Potent Anti-Inflammatory Molecule

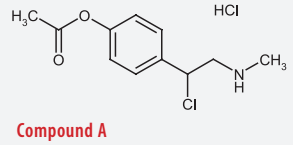
Compound A

[CpdA; 2-((4-Acetophenyl)-2-chloro-N-methyl)ethyl-ammonium chloride]

ALX-550-516-M005 5 mg
ALX-550-516-M025 25 mg

Cell permeable, nonsteroidal glucocorticoid receptor modulator with high binding affinity. Exerts anti-inflammatory potential by down-modulating TNF-induced pro-inflammatory gene expression, such as IL-6 and E-selectin. Unlike dexamethasone (Prod. No. ALX-370-002) it does not enhance glucocorticoid response element (GRE)-driven gene expression or induce glucocorticoid receptor (GR) binding to GRE-dependent genes *in vivo*.

LIT: A fully dissociated compound of plant origin for inflammatory gene repression: K. De Bosscher, et al.; PNAS **102,** 15827 (2005) ▪ A plant-derived ligand favoring monomeric glucocorticoid receptor conformation with impaired transactivation potential attenuates collagen-induced arthritis: P. Dewint, et al.; J. Immunol. **180,** 2608 (2008)



Compound A

Rocaglamides

Nuclear factor of activated T cells (NF-AT) was originally identified as an inducible nuclear transcription factor that could bind to the interleukin-2 promoter in activated T cells [1]. NF-AT is a multigene family containing five members: NF-ATc1, NF-ATc2, NF-ATc3, NF-ATc4, and NF-AT5. Except for NF-AT5, which is activated in response to osmotic stress [2], all NF-AT family members are regulated by the calcium-activated protein phosphatase calcineurin [3, 4]. In immune cells NF-AT controls both lymphocyte activation and tolerance. Recently, it has been shown that T_R function depends on the interaction of FOXP3 with NF-AT [5]. Rocaglamide derivatives target NF-AT activity in T cells [6].

Literature References

[1] Identification of a putative regulator of early T cell activation genes: J. P. Shaw, et al.; Science **241**, 202 (1988) ▪ **[2]** Tonicity-responsive enhancer binding protein, a rel-like protein that stimulates transcription in response to hypertonicity: H. Miyakawa, et al.; PNAS **96,** 2538 (1999) ▪ **[3]** Transcriptional regulation by calcium, calcineurin, and NFAT: P. G. Hogan, et al.; Genes Dev. **17,** 2205 (2003) ▪ **[4]** Induction and activation of the transcription factor NFATc1 (NFAT2) integrate RANKL signaling in terminal differentiation of osteoclasts: H. Takayanagi, et al.; Dev. Cell **3,** 889 (2002) ▪ **[5]** FOXP3 controls regulatory T cell function through cooperation with NFAT: Y. Wu, et al.; Cell **126,** 375 (2006) ▪ **[6]** Rocaglamide derivatives are immunosuppressive phytochemicals that target NF-AT activity in T cells: P. Proksch, et al.; J. Immunol. **174**, 7075 (2005)

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. Induces apoptosis in leukemia cells by modulation of MAPK activities.

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) ▪ Potential of cyclopenta[b]benzofurans from Aglaia species in cancer chemotherapy: S. Kim, et al.; Anticancer Agents Med. Chem. **6,** 319 (2006) (Review) ▪ The traditional Chinese herbal compound rocaglamide preferentially induces apoptosis in leukemia cells by modulation of mitogen-activated protein kinase activities: J.Y. Zhu, et al.; Int. J. Cancer **121,** 1839 (2007)

Rocaglamide Derivatives

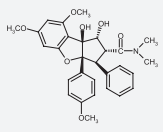
Rocaglaol
ALX-350-135-C100 100 µg

Rocaglamide AL
ALX-350-140-C050 50 µg

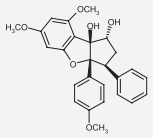
Rocaglamide C
ALX-350-141-C050 50 µg

Rocaglamide I
ALX-350-142-C050 50 µg

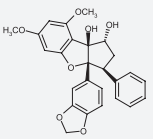
Rocaglamide J
ALX-350-143-C050 50 µg



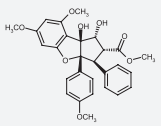
Rocaglamide



Rocaglaol



Rocaglamide AL



Rocaglamide J

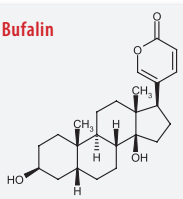
Bufadienolides

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). Recently, several studies described that bufalin exerts potent antitumor activities by inducing apoptosis and inhibiting proliferation in several tumor cell lines [5, 6].

Literature References

[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) (Review) ▪ **[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) ▪ **[5]** Effects of bufalin and cinobufagin on the proliferation of androgen dependent and independent prostate cancer cells: J.Y. Yeh, et al.; Prostate **54,** 112 (2003) (Review) ▪ **[6]** Endogenous and exogenous cardiac glycosides: their roles in hypertension, salt metabolism, and cell growth: W. Schoner & G. Scheiner-Bobis; Am. J. Physiol. Cell Physiol. **293,** C509 (2007) (Review)

Bufalin



Bufalin
ALX-350-281-M005 5 mg

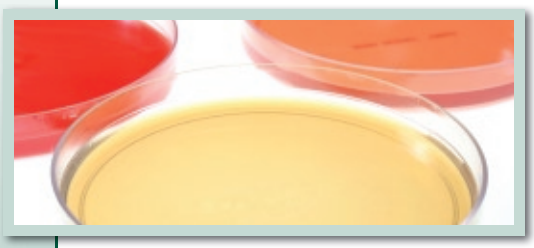
Bufotalin
ALX-350-282-M005 5 mg

Cinobufagin
ALX-350-283-M005 5 mg

Cinobufotalin
ALX-350-284-M005 5 mg

Proscillaridin A
ALX-350-285-M005 5 mg

Resibufogenin
ALX-350-286-M010 10 mg



Geldanamycin

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

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.

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)

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

Products

17-AAG

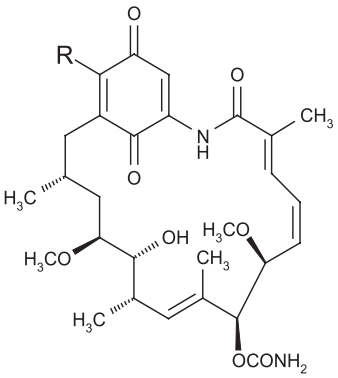
ALX-380-091-C100	100 µg
ALX-380-091-M001	1 mg

17-DMAG

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



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

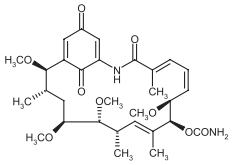
Other HSP90 Inhibitors

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) ▪ For a comprehensive bibliography please visit our website.

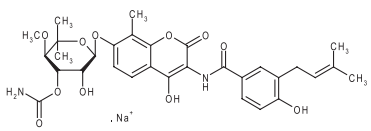


Novobiocin . sodium salt

ALX-380-093-G001	1 g

Inhibitor of HSP90. Interacts with the C-terminal ATP-binding domain of HSP90.

LIT: Novobiocin-a specific inhibitor of semiconservative DNA replication in permeabilized Escherichia coli cells: W.L. Staudenbauer; J. Mol. Biol. **96,** 201 (1975) ▪ For a comprehensive bibliography please visit our website.

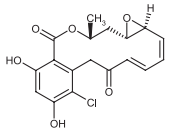


Radicicol

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

Potent inhibitor of HSP90. 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) ▪ For a comprehensive bibliography please visit our website.



Floxacins – Wide Panel of Synthetic Antibiotics

Floxacins are quinolones which comprise a relatively large group of synthetic antibiotics. The first of these compounds was the naphthyridine agent, nalidixic acid, an antibacterial by-product of chloroquine synthesis [1]. Two major structures have been developed from the basic compound: the quinolones with a carbon and associated group at position 8 [2, 3] and the naphthyridones with nitrogen at position 8 [4].

The addition of a fluorine molecule at position 6 was one of the earliest changes to the basic structure and led to the first generation fluoroquinolones and naphthyridones such as norfloxacin, ofloxacin and ciprofloxacin. This single alteration provides a more than 10-fold increase in gyrase inhibition and up to 100-fold improvement in minimal inhibitory concentration. The fluorinated quinolones were further enhanced by the addition of groups to the N1, C-5 and C-7 positions of their respective basic molecules. The addition of piperazine or a pyrrolidine ring to the C-7 position improves activity against Gram-negative organisms. Subsequent second generation fluoroquinolones such as sparfloxacin, temafloxacin and gatifloxacin [5], have shown increased Gram-positive activity.

The third generation of fluoroquinolones are compounds such as clinafloxacin. Substituents at position 8 impact good anaerobic activity. Halogens at C-8 are associated with poor stability to UV-light and phototoxicity. Better results were obtained with a methoxy group at C-8. Toxicity and side-effects such as allergies and gastrointestinal problems have resulted in the withdrawal of some promising compounds. Positive features of the new generation fluoroquinolones are:

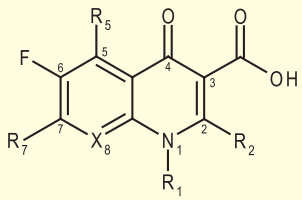
- High bioavailability, better pharmacokinetics and tissue penetration
- Low protein binding
- Longer half-lives
- Higher activities against Gram-positive cocci (especially pneumococci) and against anaerobes.

The mechanism of fluoroquinolone action is targeted to the DNA gyrase and topoisomerase IV [6-8]. The fluoroquinolones penetrate extremely well into tissues and mammalian cells. For a selected review article see [9].

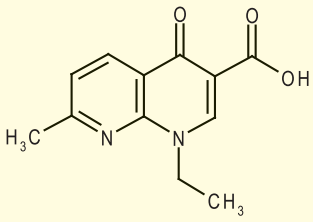
Literature References

[1] 1,8-Naphthyridine Derivatives. A New Class of Chemotherapeutic Agents: G.Y. Lesher, et al.; J. Med. Pharm. Chem. **91,** 1063 (1962) ▪ [2] Quinolone generations: natural history or natural selection?: P. Ball; J. Antimicrob. Chemother. **46 Suppl T1**, 17 (2000) ▪ [3] Development of the quinolones: M.I. Andersson & A.P. MacGowan; J. Antimicrob. Chemother. **51 Suppl 1**, 1 (2003) ▪ [4] Structure-activity and structure-side-effect relationships for the quinolone antibacterials: J.M. Domagala; J. Antimicrob. Chemother. **33,** 685 (1994) [5] Fluoroquinolone antimicrobial agents: J.S. Wolfson & D.C. Hooper; Clin. Microbiol. Rev. **2,** 378 (1989) ▪ [6] The DNA gyrase-quinolone complex. ATP hydrolysis and the mechanism of DNA cleavage: S.C. Kampranis & A. Maxwell; J. Biol. Chem. **273,** 22615 (1998) ▪ [7] The mechanism of inhibition of topoisomerase IV by quinolone antibacterials: A.B. Khodursky & N.R. Cozzarelli; J. Biol. Chem. **273,** 27668 (1998) ▪ [8] DNA gyrase and topoisomerase IV: biochemical activities, physiological roles during chromosome replication, and drug sensitivities: C. Levine, et al.; Biochim. Biophys. Acta **1400**, 29 (1998) ▪ [9] The fluoroquinolone antibacterials: past, present and future perspectives: P.C. Appelbaum & P.A. Hunter; Int. J. Antimicrob. Agents **16,** 5 (2000)

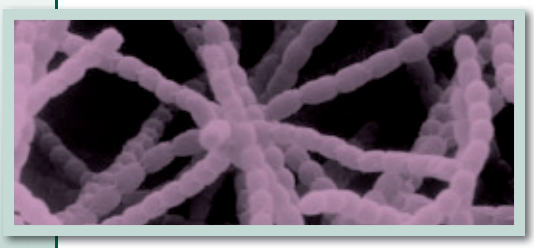
Product Name	CAS No.	MI 14:	Prod No.	Size
Ciprofloxacin	85721-33-1	2314	ALX-380-287-G005 ALX-380-287-G025	5 g 25 g
Ciprofloxacin . HCl	86393-32-0	2314	ALX-380-288-G005 ALX-380-288-G025	5 g 25 g
Clinafloxacin . HCl	105956-97-6	2355	ALX-380-289-M250 ALX-380-289-G001	250 mg 1 g
Enrofloxacin	93106-60-6	3592	ALX-380-290-G005 ALX-380-290-G025	5 g 25 g
Gatifloxacin	112811-59-3	4376	ALX-380-291-G001 ALX-380-291-G005	1 g 5 g
Levofloxacin . HCl	100986-85-4	4376	ALX-380-292-G001 ALX-380-292-G005	1 g 5 g
Lomefloxacin . HCl	98079-51-7	5562	ALX-380-293-G001 ALX-380-293-G005	1 g 5 g
Nadifloxacin	124858-35-1	6345	ALX-380-294-M250 ALX-380-294-G001	250 mg 1 g
Norfloxacin	70458-96-7	6700	ALX-380-295-G001 ALX-380-295-G005	1 g 5 g
Norfloxacin nicotinate	118803-81-9	6700	ALX-380-296-G001 ALX-380-296-G005	1 g 5 g
Ofloxacin	82419-36-1	6771	ALX-380-297-G005	5 g
Pefloxacine . mesylate . $2H_2O$	149676-40-4	7066	ALX-380-298-G005	5 g
Prulifloxacin	123447-62-1	7908	ALX-380-299-M250 ALX-380-299-G001	250 mg 1 g
Rufloxacin . HCl	106017-08-7	8294	ALX-380-300-M050 ALX-380-300-M250	50 mg 250 mg
Sarafloxacin . HCl	91296-87-6	8370	ALX-380-301-G005 ALX-380-301-G025	5 g 25 g
Sparfloxacin	11087186-8	8735	ALX-380-302-G001 ALX-380-302-G005	1 g 5 g
Tosulfloxacin tosylate	115964-29-9	9555	ALX-380-303-M250 ALX-380-303-G001	250 mg 1 g



Naphthyridone: X=N
Quinolone: X=CH



Nalidixic acid



Staurosporine & Related Products

Staurosporine was first isolated from *Streptomyces staurosporeus* and is a potent cell permeable inhibitor of protein kinase C (PKC). The PKC family consists of multiple isoforms and is involved in cell proliferation, differentiation and malignant transformation. Therefore PKCs inhibitors have attracted much attention because of their potential benifical effect on cancer. Staurosporine is a potent but nonselective inhibitor of PKC, capable of inhibiting all the isoforms. In addition to PKC, staurosporine inhibits a variety of other protein kinases including mitogen-activated protein (MAP) kinases and cyclin-dependent kinases (CDKs). Based predominantly on its anti-PKC activities and its ability to induce cell cycle arrest and apoptosis, staurosporine and its analogs are being tested in clinical trials, and have shown some promise as anticancer agents.

LIT: Staurosporine, a potent inhibitor of phospholipid/Ca++dependent protein kinase: T. Tamaoki, et al.; BBRC **135,** 397 (1986) ▪ Staurosporine, K-252 and UCN-01: potent but nonspecific inhibitors of protein kinases: U.T. Ruegg & G.M. Burgess; TIPS **10,** 218 (1989) (Review) ▪ Staurosporine: a prototype of a novel class of inhibitors of tumor cell invasion?: C.A. O'Brian & N.E. Ward; J. Natl. Cancer Inst. **82,** 1734 (1990) ▪ Staurosporine: an effective inhibitor for Ca2+/calmodulin-dependent protein kinase II: N. Yanagihara, et al.; J. Neurochem. **56,** 294 (1991) ▪ Staurosporine reduces P-glycoprotein expression and modulates multidrug resistance: K.E. Sampson, et al.; Cancer Lett. **68,** 7 (1993) ▪ Induction of a common pathway of apoptosis by staurosporine: R. Bertrand, et al.; Exp. Cell Res. **211,** 314 (1994) ▪ Differing effects of staurosporine and UCN-01 on RB protein phosphorylation and expression of lung cancer cell lines: E. Shimizu, et al.; Oncology **53,** 494 (1996) ▪ Mechanism of topoisomerase II inhibition by staurosporine and other protein kinase inhibitors: P. Lassota, et al.; J. Biol. Chem. **271,** 26418 (1996) ▪ Induction by staurosporine of nitric oxide synthase expression in vascular smooth muscle cells: role of NF-kappa B, CREB and C/EBP beta: M. Hecker, et al.; Br. J. Pharmacol. **120,** 1067 (1997) ▪ Both low and high concentrations of staurosporine induce G1 arrest through down-regulation of cyclin E and cdk2 expression: Z.P. Zong, et al.; Cell Struct. Funct. **24,** 457 (1999) ▪ Staurosporine analogues - pharmacological toys or useful antitumour agents?: A. Gescher; Crit. Rev. Oncol. Hematol. **34,** 127 (2000) ▪ Staurosporine-induced G(1) arrest in cancer cells depends on an intact pRB but is independent of p16 status: W. Zhou, et al.; Cancer Lett. **183,** 103 (2002) ▪ Staurosporine induces apoptosis of melanoma by both caspase-dependent and -independent apoptotic pathways: X.D. Zhang, et al.; Mol. Cancer Ther. **3,** 187 (2004) ▪ The differential staurosporine-mediated G1 arrest in normal versus tumor cells is dependent on the retinoblastoma protein: M. McGahren-Murray, et al.; Cancer Res. **66,** 9744 (2006)

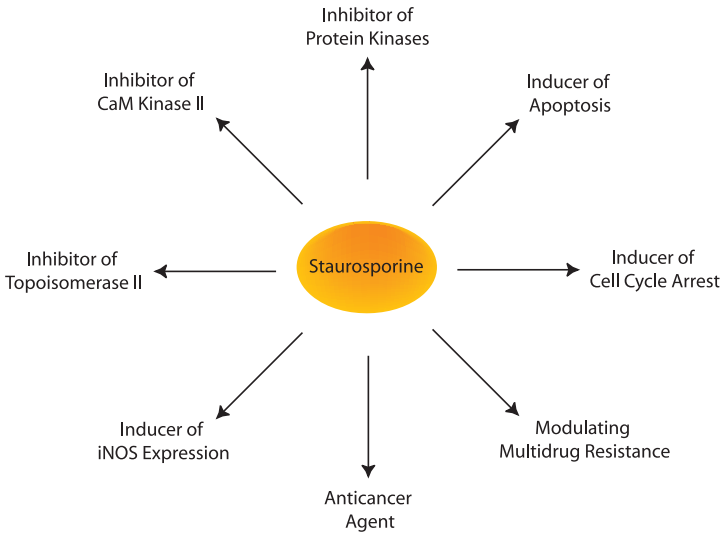


FIGURE: Selected Biological Activities of Staurosporine

Staurosporine

[Antibiotic AM-2282]

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

Model apoptosis inducer. Potent cell-permeable inhibitor of a variety of protein kinases, e.g. CDK1/cyclin B (IC_{50}~5nM), CDK2/cyclin A (IC_{50}=7nM), CDK4/cyclin D (IC_{50}=3-10µM), CDK5/p25 (IC_{50}=4nM) and GSK-3β (IC_{50}=15nM).

LIT: A new alkaloid AM-2282 of Streptomyces origin. Taxonomy, fermentation, isolation and preliminary characterization: S. Omura, et al.; J. Antibiot. (Tokyo) **30,** 275 (1977) ▪ **For a comprehensive bibliography please visit our website.**

NEW 7-Oxostaurosporine

[Antibiotic BMY 41950; Antibiotic RK 1409; LCM76-L]

ALX-380-210-M001	1 mg

Potent inhibitor of protein kinase C (PKC). Inhibits the cell cycle at the G2 stage.

LIT: A new inhibitor of protein kinase C, RK-1409 (7-oxostaurosporine). I. Taxonomy and biological activity: H. Osada, et al.; J. Antibiot. **45,** 189 (1992) ▪ A new inhibitor of protein kinase C, RK-1409 (7-oxostaurosporine). II. Fermentation, isolation, physico-chemical properties and structure: H. Koshino, et al.; J. Antibiot. **45,** 195 (1992)

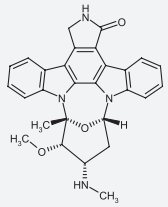
NEW PKC412

[4'-N-Benzoyl-staurosporine; Midostaurin]

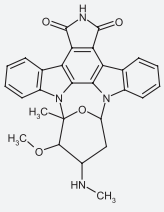
ALX-380-281-M001	1 mg
ALX-380-281-M005	5 mg

Inhibitor of a variety of serine/threonine and tyrosine kinases, like protein kinase C (PKC), cyclic AMP-dependent protein kinase (PKA), S6 kinase, Akt (protein kinase B; PKB) and epidermal growth factor receptor (EGFR) tyrosine kinase activity. Potently inhibits FLT-3 kinase *in vitro* and *in vivo*. Apoptosis inducer. Showed broad antiproliferative activity against various tumor cell lines. Selectively inhibits T lymphocyte production of TNF-α. Upregulates endothelial nitric oxide synthase (eNOS; NOSIII)

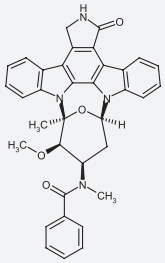
LIT: Differential inhibition of the epidermal growth factor-, platelet-derived growth factor-, and protein kinase C-mediated signal transduction pathways by the staurosporine derivative CGP 41251: E. Andrejauskas-Buchdunger & U. Regenass; Cancer Res. **52,** 5353 (1992) ▪ Inhibitors of protein kinases: CGP 41251, a protein kinase inhibitor with potential as an anticancer agent: D. Fabbro, et al.; Pharmacol. Ther. **82,** 293 (1999) ▪ N-Benzoylstaurosporine (PKC412) inhibits Akt kinase inducing apoptosis in multiple myeloma cells.: N.J. Bahlis, et al.; Leuk. Lymphoma **46,** 899 (2005) ▪ The FLT3 inhibitor PKC412 exerts differential cell cycle effects on leukemic cells depending on the presence of FLT3 mutations: T. Odgerel, et al.; Oncogene **Epub ahead of print,** (2007) ▪ PKC412 demonstrates JNK-dependent activity against human multiple myeloma cells: J. Sharkey, et al.; Blood **109,** 1712 (2007) ▪ **For a comprehensive bibliography please visit our website.**



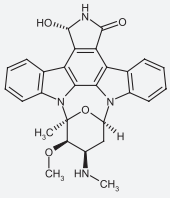
Staurosporine



7-Oxostaurosporine



PKC412



UCN-01

K-252c – A Key Aglycone for Medicinal Chemistry

K-252c: Biological Activity

The aglycone of the biologically important alkaloid staurosporine, K-252c, also termed staurosporinone, is itself a natural product. It was isolated in 1986 from the culture broth of *Nocardiopsis sp.* K-290. The structure and physico-chemical properties of this compound, as well as of the analogous K-252a, K-252b and K-252d were described in [2]. The common structure to those protein kinase C inhibitors is the same indolo[2,3-a]carbazole chromophore also found later in other natural compounds.

The indolocarbazoles all show a biological activity and display various properties ranging from antifungal, antimicrobial, and antitumor to hypertensive effects. However their activity as potent inhibitors of protein kinase C (PKC) is the property which has attracted the greatest interest. An overview of this class of alkaloids and their analogs can be found in [3].

Staurosporine, K-252a and K-252b have higher inhibitory activities than K-252c, but the latter compound has been tested and found to be active in the low µmolar range. In the original article K-252c was found to inhibit PKC with an IC_{50} value of 0.214 µM [1]. Kleinschroth, et al. found a value of 0.68 µM, thus confirming the original findings [4]. This also confirmed that the inhibitory activity resides in the indolocarbazole moiety. S. Fabre, et al. determined an IC_{50} value of 2.45 µM [5]. K-252c exhibited a more potent inhibitory activity (about 10-fold) against PKC than against PKA. In other investigations K-252c inhibited cell-adhesion of the EL-4. IL-2 cell line and expressed activity in the K562 bleb and neutrophil assays, in addition to showing micromolar and submicromolar inhibition of enzyme activity against seven PKC isoenzymes [6]. Finally, K-252c was found to inhibit three diverse non-kinase enzymes (β-lactamase, chymotrypsin, and malate dehydrogenase). Inhibition was time-dependent and sensitive to the enzyme concentration [7].

Literature References

[1] K-252b, c and d, potent inhibitors of protein kinase C from microbial origin: S. Nakanishi, et al.; J. Antibiot. **39,** 1066 (1986) ▪ **[2]** The structures of the novel protein kinase C inhibitors K-252a, b, c and d: T. Yasuzawa, et al.; J. Antibiot. **39,** 1072 (1986) ▪ **[3]** Advances in indolo[2,3-a]carbazole chemistry: design and synthesis of protein kinase C and topoisomerase I inhibitors: U. Pindur, et al.; Curr. Med. Chem. **6,** 29 (1999) ▪ **[4]** Non-glycosidic/non-aminoalkyl-substituted indolocarbazoles as inhibitors of protein kinase C: J. Kleinschroth, et al.; Bioorg. Med. Chem. Lett. **3,** 1959 (1993) ▪ **[5]** Protein kinase C inhibitors; structure-activity relationships in K252c-related compounds: S. Fabre, M. Prudhomme and M.Rappas; Bioorg. Med. Chem. **1,** 193 (1993) ▪ **[6]** Staurosporine aglycone (K252-c) and arcyriaflavin A from the marine ascidian, Eudistoma sp: P. A. Horton, et al.; Experientia **50,** 843 (1994). ▪ **[7]** Kinase inhibitors: not just for kinases anymore: S. L. McGovern & B. K. Shoichet; J. Med. Chem. **46,** 1478 (2003)

K-252c

[Staurosporinone; Staurosporine Aglycone]

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

Weak inhibitor of protein kinase C (PKC). Aglycone of staurosporine.

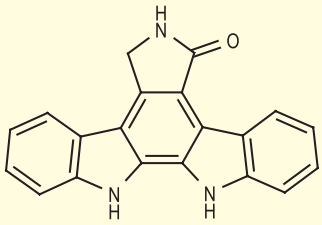
FORMULA: $C_{20}H_{13}N_3O$

MW: 311.15

CAS NUMBER: 85753-43-1

PURITY: ≥95%

For BULK quantities please inquire!



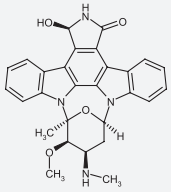
Examples of use:

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

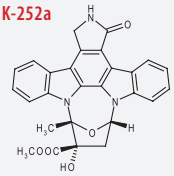
LIT: Non-glycosidic/non-aminoalkyl-substituted indolocarbazoles as inhibitors of protein kinase C: J. Kleinschroth, et al.; Bioorg. Med. Chem. Lett. **3,** 1959 (1993)

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

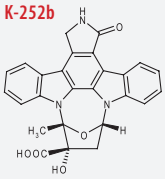
LIT: Design and implementation of an efficient synthesis approach to furanosylated indolocarbazoles: total synthesis of (+)- and (-)-K252a: J. L. Wood, et al.; JACS **119,** 9641 (1997)



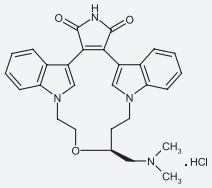
UCN-02



K-252a



K-252b



LY-333,531 . HCl

NEW UCN-01

[7-Hydroxystaurosporine]

ALX-380-222-M001 1 mg
ALX-380-222-M005 5 mg

Inhibitor of 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 anticancer drugs, such as DNA-damaging agents and anti-metabolite drugs, through putative abrogation of G2 and/or S phase accumulation induced by these agents.

LIT: UCN-01, a selective inhibitor of protein kinase C from Streptomyces: I. Takahashi, et al.; J. Antibiot. (Tokyo) **40,** 1782 (1987) ▪ 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) ▪ UCN-01 (7-hydroxystaurosporine) and other indolocarbazole compounds: a new generation of anti-cancer agents for the new century?: S. Akinaga, et al.; Anticancer Drug Des. **15,** 43 (2000) ▪ UCN-01-induced cell cycle arrest requires the transcriptional induction of p21(waf1/cip1) by activation of mitogen-activated protein/extracellular signal-regulated kinase kinase/extracellular signal-regulated kinase pathway: M.M. Facchinetti, et al.; Cancer Res. **64,** 3629 (2004)

NEW UCN-02

ALX-380-206-M001 1 mg

Inhibitor of protein kinase C (PKC) and protein kinase A (PKA). Although less selective than its isomer UCN-01 (Prod. No. ALX-380-222), UCN-02 exhibits comparable activity and probably acts by similar mechanisms.

LIT: 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)

Note: Some interconversion of UCN-02 to UCN-01 may occur under acidic HPLC conditions.

K-252a

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

General, cell permeable protein kinase inhibitor. Potent inhibitor of Ca^{2+}/calmodulin kinase II. Inhibits myosin light chain kinase, cAMP-dependent protein kinase (PKA), protein kinase C (PKC), and cGMP-dependent protein kinase (PKG). Induces apoptosis.

LIT: K-252a, a potent inhibitor of protein kinase C from microbial origin: H. Kase, et al.; J. Antibiot. **39,** 1059 (1986) ▪ The structures of the novel protein kinase C inhibitors K-252a, b, c and d: T. Yasuzawa, et al.; J. Antibiot. **39,** 1072 (1986) ▪ Staurosporine, K-252 and UCN-01: potent but nonspecific inhibitors of protein kinases: U.T. Ruegg & G.M. Burgess; TIPS **10,** 218 (1989) ▪ K252a is a potent and selective inhibitor of phosphorylase kinase: L.H. Elliott, et al.; BBRC **171,** 148 (1990) ▪ Potent and preferential inhibition of Ca2+/calmodulin-dependent protein kinase II by K252a and its derivative, KT5926: Y. Hashimoto, et al.; BBRC **181,** 423 (1991) ▪ **For a comprehensive bibliography please visit our website.**

K-252b

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

General, cell permeable protein kinase inhibitor. Potent inhibitor of Ca^{2+}/calmodulin kinase II. Inhibits myosin light chain kinase, cAMP-dependent protein kinase (PKA), protein kinase C (PKC), and cGMP-dependent protein kinase (PKG).

LIT: K-252b, c and d, potent inhibitors of protein kinase C from microbial origin: S. Nakanishi, et al.; J. Antibiot. **39,** 1066 (1986) ▪ The structures of the novel protein kinase C inhibitors K-252a, b, c and d: T. Yasuzawa, et al.; J. Antibiot. **39,** 1072 (1986) ▪ Staurosporine, K-252 and UCN-01: potent but nonspecific inhibitors of protein kinases: U.T. Ruegg & G.M. Burgess; TIPS **10,** 218 (1989) ▪ Potent and preferential inhibition of Ca2+/calmodulin-dependent protein kinase II by K252a and its derivative, KT5926: Y. Hashimoto, et al.; BBRC **181,** 423 (1991) ▪ **For a comprehensive bibliography please visit our website.**

LY-333,531 . HCl

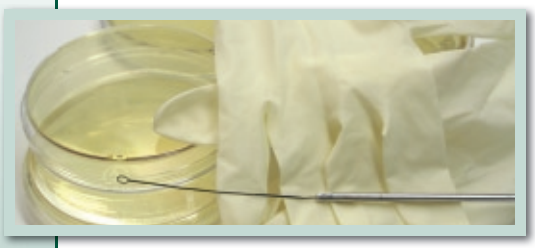
[Ruboxistaurin]

ALX-270-348-M001 1 mg
ALX-270-348-M005 5 mg

Isozyme selective inhibitor of protein kinase Cβ (PKCβ). Inhibits both the PKCβI (IC_{50}=4.7nM) and PKCβII (IC_{50}=5.9nM) isozymes. 76- and 61-fold more selective for inhibition of PKCβI and PKCβII over PKCα.

LIT: (S)-13-[(dimethylamino)methyl]-10,11,14,15-tetrahydro-4,9:16,21-dimetheno-1H, 13H-dibenzo[e,k]pyrrolo[3,4-h][1,4,13]oxadiazaclohexadecene-1,3(2H)-dione (LY333531) and related analogues: isozyme selective inhibitors of protein kinase: M.R. Jirousek, et al.; J. Med. Chem. **39,** 2664 (1996)

ALEXIS® BIOCHEMICALS



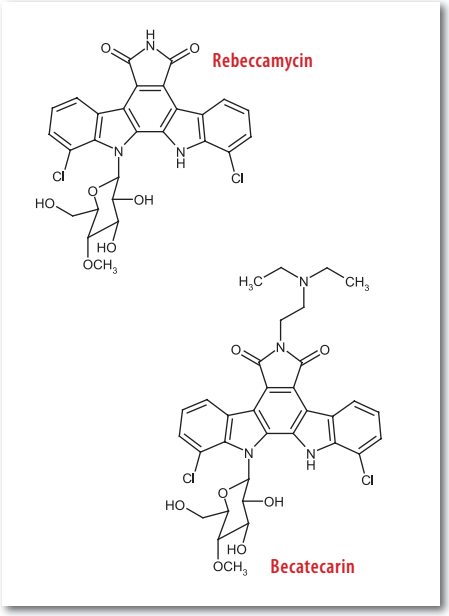
Becatecarin – A Water-soluble Derivative of Rebeccamycin

Rebeccamycin

ALX-380-079-C250 250 µg
ALX-380-079-M001 1 mg

Rebeccamycin is an indocarbazole antibiotic structurally similar to staurosporine. As an antitumor agent, rebeccamycin shows significant activity against several tumor cell lines such as mouse B16 melanoma cells (IC_{50}= 480nM) and P388 leukemia cells (IC_{50}= 500nM). Rebeccamycin intercalates into DNA and is a weak inhibitor of topoisomerase I. In contrast to several analogs, rebeccamycin itself has no inhibitory activity against protein kinases. Rebeccamycin analogs are currently in clinical trials for cancer therapy.

LIT: Production and biological activity of rebeccamycin, a novel antitumor agent: J.A. Bush, et al.; J. Antibiot. (Tokyo) **40,** 668 (1987) ▪ Structure-activity relationships in a series of substituted indolocarbazoles: topoisomerase I and protein kinase C inhibition and antitumoral and antimicrobial properties: E.R. Pereira, et al.; J. Med. Chem. **39,** 4471 (1996) ▪ Syntheses and biological activities (topoisomerase inhibition and antitumor and antimicrobial properties) of rebeccamycin analogues bearing modified sugar moieties and substituted on the imide nitrogen with a methyl group: F. Anizon, et al.; J. Med. Chem. **40,** 3456 (1997) ▪ DNA cleavage by topoisomerase I in the presence of indolocarbazole derivatives of rebeccamycin: C. Bailly, et al.; Biochemistry **36,** 3917 (1997) ▪ Semi-synthesis, topoisomerase I and kinases inhibitory properties, and antiproliferative activities of new rebeccamycin derivatives: P. Moreau, et al.; Bioorg. Med. Chem. **11,** 4871 (2003) ▪ Syntheses and biological activities of rebeccamycin analogues with uncommon sugars: G. Zhang, et al.; J. Med. Chem. **48,** 2600 (2005)



NEW Becatecarin

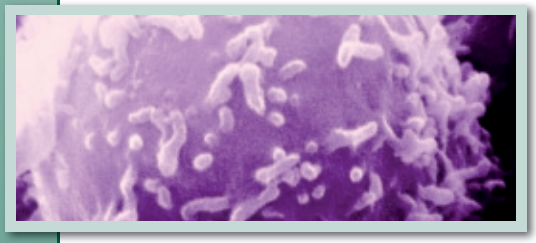
ALX-380-119-C250 250 µg
ALX-380-119-M001 1 mg

Becatecarin is a diethylaminoethyl analog of rebeccamycin (Prod. No. ALX-380-079), which makes the compound water-soluble. Strong DNA intercalation is the primary mechanism of action of becatecarin, resulting in the potent catalytic inhibition of both topoisomerases I and II. Due to its potent antitumor activities, becatecarin is currently in clinical trials for cancer therapy.

LIT: Water soluble derivatives of rebeccamycin: T. Kaneko, et al.; J. Antibiot. (Tokyo) **43,** 125 (1990) ▪ Phase I and pharmacokinetic study of sequences of the rebeccamycin analogue NSC 655649 and cisplatin in patients with advanced solid tumors: A.D. Ricart, et al.; Clin. Cancer Res. **11,** 8728 (2005)

Selected Review Articles

Discovery of antitumor indolocarbazoles: rebeccamycin, NSC 655649, and fluoroindolocarbazoles: B.H. Long, et al.; Curr. Med. Chem. Anticancer Agents **2,** 255 (2002) ▪ Rebeccamycin analogues as anti-cancer agents: M. Prudhomme; Eur. J. Med. Chem. **38,** 123 (2003)



Antimicrobial Peptides & Proteins

Antimicrobial peptides are key components of the innate immune system of most multicellular organisms. Despite broad divergences in sequence and taxonomy, most antimicrobial peptides share a common mechanism of action, like e.g. membrane permeabilization of the pathogen.

In response to pathogen-associated molecular patterns (PAMPs) or proinflammatory cytokines antimicrobial peptides are released from storage compartments by local epithelial cells or infiltrating leukocytes. These "alarmins" include defensins [1] and cathelicidins [2] which have both chemotactic and activating effects on antigen-presenting cells (APCs). Both defensins and cathelicidins have antimicrobial activity against bacteria, fungi, some viruses and parasites. They act as natural antibiotics.

Literature References

[1] Alarmins: chemotactic activators of immune responses: J.J. Oppenheim and D. Yang; Curr. Opin. Immunol. **17,** 359 (2005) ▪ **[2]** Mammalian defensins in the antimicrobial immune response: M.E. Selsted and A.J. Ouellette; Nat. Immunol. **6,** 551 (2005)

CRAMP (mouse)

[Cathelicidin-related Antimicrobial Peptide; CLP]

[H-Gly-Leu-Leu-Arg-Lys-Gly-Gly-Glu-Lys-Ile-Gly-Glu-Lys-Leu-Lys-Lys-Ile-Gly-Gln-Lys-Ile-Lys-Asn-Phe-Phe-Gln-Lys-Leu-Val-Pro-Gln-Pro-Glu-Gln-OH]

PT-PA-AMP-002-1 50 µg
PT-PA-AMP-002-2 100 µg
PT-PA-AMP-002-3 500 µg
PT-PA-AMP-002-4 1 mg

LIT: A novel murine cathelin-like protein expressed in bone marrow: A.E. Popsueva, et al.; FEBS Lett. **391,** 5 (1996)

CRAMP-18 (mouse)

[Cathelicidin-related Antimicrobial Peptide 18aa]

[H-Gly-Glu-Lys-Leu-Lys-Lys-Ile-Gly-Gln-Lys-Ile-Lys-Asn-Phe-Phe-Gln-Lys-Leu-OH]

PT-PA-AMP-003-1 50 µg
PT-PA-AMP-003-2 100 µg
PT-PA-AMP-003-3 500 µg
PT-PA-AMP-003-4 1 mg

CRAMP-18 has potent antibiotic activity without hemolytic activity.

LIT: CRAMP analogues having potent antibiotic activity against bacterial, fungal, and tumor cells without hemolytic activity: S.Y. Shin, et al.; BBRC **275,** 904 (2000) ▪ CRAMP analog having potent antibiotic activity without hemolytic activity: S.W. Kang, et al.; Protein Pept. Lett. **9,** 275 (2002)

HNP 1-3 (Mature Peptides) (human)

PT-PA-AMP-001-1 100 µg
PT-PA-AMP-001-2 500 µg

Mixture of HNP 1-3 (α-1-3-defensins) in the native form isolated from human blood from healthy donors.

LIT: For a comprehensive bibliography please visit our website.

LL-37 (human)

[H-Leu-Leu-Gly-Asp-Phe-Phe-Arg-Lys-Ser-Lys-Glu-Lys-Ile-Gly-Lys-Glu-Phe-Lys-Arg-Ile-Val-Gln-Arg-Ile-Lys-Asp-Phe-Leu-Arg-Asn-Leu-Val-Pro-Arg-Thr-Glu-Ser-OH]

PT-PA-AMP-004-1 50 µg
PT-PA-AMP-004-2 100 µg
PT-PA-AMP-004-3 150 µg
PT-PA-AMP-004-4 200 µg

LL-37 is the C-terminal fragment of human cathelicidin and has broad antimicrobial activity.

LIT: For a comprehensive bibliography please visit our website.

CAP37 (human)

[Heparin-binding Protein; HBP; Azurocidin]

BC0-5016-1 50 µg

Isolated from human blood from healthy donors. **MW:** 29.5kDa. **PURITY:** >95 % (SDS-PAGE).

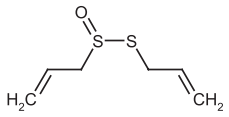
Active Substances from Fruits and Vegetables

Allicin

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)

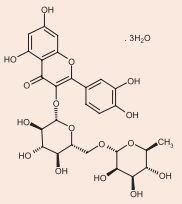


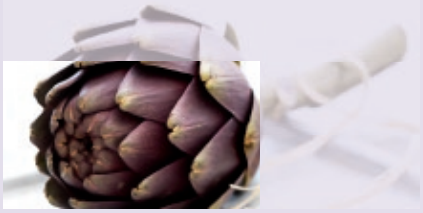
Rutin . $3H_2O$

ALX-460-028-G005 5 g

Antioxidant flavonoid. Nitric oxide (NO) scavenger.

LIT: Flavonoids as scavengers of nitric oxide radical: S.A.B.E. Acker, et al.; BBRC **214,** 755 (1995) ▪ Structure-antioxidant activity relationships of flavonoids and phenolic acids: C.A. Rice-Evans, et al.; Free Radical Biol. & Med. **20,** 933 (1996) ▪ Antimicrobial activity of flavonoids: T. P. Cushnie & A. J. Lamb; Int. J. Antimicrob. Agents **26,** 343 (2005)





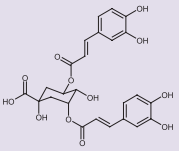
3,5-Di-O-caffeoylquinic acid

[3,5-CQA; Isochlorogenic acid]

ALX-350-320-M001 1 mg
ALX-350-320-M005 5 mg

Isolated from *Cynara scolymus*. Antioxidant. Shows antiproliferative activity.

LIT: Biochemistry on postharvest metabolism and deterioration of some tropical tuberous crops: I. Uritani; Bot. Bull. Acad. Sinica **40,** 177 (1999) ▪ In vitro antioxidative effects and tyrosinase inhibitory activities of seven hydroxycinnamoyl derivatives in green coffee beans: K. Iwai, et al.; J. Agric. Food Chem. **52,** 4893 (2004) ▪ Changes in caffeic acid derivatives in sweet potato (Ipomoea batatas L.) during cooking and processing: M. Takenaka, et al.; Biosci. Biotechnol. Biochem. **70,** 172 (2006)

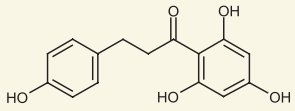


Phloretin

ALX-270-113-M100 100 mg

Protein kinase C (PKC) inhibitor. $PGF_2\alpha$ receptor antagonist. In astrocytes, these receptors are linked to phospholipase C, thus affecting phosphoinositide hydrolysis and intracellular Ca^{2+} levels. Also inhibits myo-inositol uptake and inhibits 5'-iodothyronine deiodinase. Prevents TNF-α stimulated upregulation of VCAM-1, ICAM-1 and E-selectin. Enhances adiponectin expression.

LIT: Effects on water diffusion of inhibitors affecting various transport processes in human red blood cells: G. Benga, et al.; Eur. J. Cell Biol. **59,** 219 (1992) ▪ Phloretin as an antagonist of prostaglandin F2 alpha receptor in cultured rat astrocytes: J. Kitanaka, et al.; J. Neurochem. **60,** 704 (1993) ▪ Activating effect of the flavonoid phloretin on Ca(2+)-activated K+ channels in myelinated nerve fibers of Xenopus laevis: D.S. Koh, et al.; Neurosci. Lett. **165,** 167 (1994) ▪ The flavonoid phloretin suppresses stimulated expression of endothelial adhesion molecules and reduces activation of human platelets: V. Stangl, et al.; J. Nutr. **135,** 172 (2005) ▪ Phloretin enhances adipocyte differentiation and adiponectin expression in 3T3-L1 cells: M. Hassan, et al.; BBRC **361,** 208 (2007)



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)

Carnosic acid

ALX-270-264-M010 10 mg
ALX-270-264-M050 50 mg

Isolated from *Rosmarinus officinalis*. Naturally occurring phenolic compound with antioxidant properties. Inhibits lipid peroxidation induced by NADH or NADPH oxidation. Anti-inflammatory. Antimicrobial.

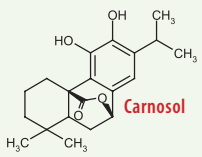
LIT: Antioxidative constituents of Rosmarinus officinalis and Salvia officinalis. II. Isolation of carnosic acid and formation of other phenolic diterpenes: K. Schwarz & W. Ternes; Z. Lebensm. Unters. Forsch. **195,** 99 (1992) ▪ Antioxidant and pro-oxidant properties of active rosemary constituents: carnosol and carnosic acid: O.I. Aruoma, et al.; Xenobiotica **22,** 257 (1992) ▪ Carnosic acid and carnosol, phenolic diterpene compounds of the labiate herbs rosemary and sage, are activators of the human peroxisome proliferator-activated receptor gamma: O. Rau, et al.; Planta Med. **72,** 881 (2006) ▪ Potentiation of antimicrobial activity of aminoglycosides by carnosol from Salvia officinalis: K. Horiuchi, et al.; Biol. Pharm. Bull. **30,** 287 (2007)

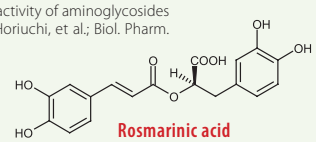
Carnosol

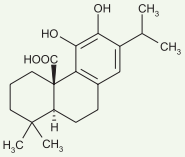
ALX-270-254-M001 1 mg
ALX-270-254-M005 5 mg

Isolated from *Rosmarinus officinalis*. Naturally occurring phenolic compound with antioxidant properties. Antimicrobial. Anticarcinogenic. Inhibits lipid peroxidation.

LIT: Antioxidant and pro-oxidant properties of active rosemary constituents: carnosol and carnosic acid: O.I. Aruoma, et al.; Xenobiotica **22,** 257 (1992) ▪ Inhibition of lipid peroxidation and superoxide generation by diterpenoids from Rosmarinus officinalis: H. Haraguchi, et al.; Planta Med. **61,** 333 (1995) ▪ Inhibition by rosemary and carnosol of 7,12-dimethylbenz[a]anthracene (DMBA)-induced rat mammary tumorigenesis and in vivo DMBA-DNA adduct formation: K. Singletary, et al.; Cancer Lett. **104,** 43 (1996) ▪ Carnosol, an antioxidant in rosemary, suppresses inducible nitric oxide synthase through down-regulating nuclear factor-kappaB in mouse macrophages: A.H. Lo, et al.; Carcinogenesis **23,** 983 (2002) ▪ Potentiation of antimicrobial activity of aminoglycosides by carnosol from Salvia officinalis: K. Horiuchi, et al.; Biol. Pharm. Bull. **30,** 287 (2007)


Carnosol


Rosmarinic acid

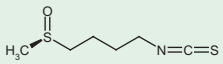

Carnosic acid

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.

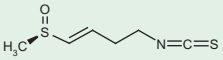


LIT: A major inducer of anticarcinogenic protective enzymes from broccoli: isolation and elucidation of structure: Y. Zhang, et al.; PNAS **89,** 2399 (1992) ▪ Sulforaphane inhibits extracellular, intracellular, and antibiotic-resistant strains of Helicobacter pylori and prevents benzo[a]pyrene-induced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

L-Sulforaphene

[S-Sulforaphene; Raphanin]

ALX-350-231-M010 10 mg



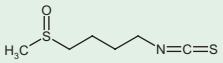
Chiral natural product isolated from radish seeds (*Raphanus sativus L.*) and broccoli. May protect from stomach ulcers induced by *Helicobacter pylori*.

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.

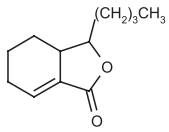


LIT: A major inducer of anticarcinogenic protective enzymes from broccoli: isolation and elucidation of structure: Y. Zhang, et al.; PNAS **89,** 2399 (1992)

Sedanolide

ALX-350-229-M100 100 mg

Isolated from *Apium graveolens* L. Inducer of glutathione S-transferases and inhibitor of chemically induced carcinogenesis. Mosquitocidal, nematicidal and antifungal. Was shown to inhibit COX-1 and COX-2 as well as topoisomerase-I and topoisomerase-II.



LIT: Chemoprevention of benzo[a] pyrene-induced forestomach cancer in mice by natural phthalides from celery seed oil: G.-Q. Zheng, et al.; Nutr. Cancer **19,** 77 (1993) ▪ Mosquitocidal, nematicidal, and antifungal compounds from Apium graveolens L. seeds: R.A. Momin & M.G. Nair; J. Agric. Food Chem. **49,** 142 (2001) ▪ Sedanolide, a natural phthalide from celery seed oil: effect on hydrogen peroxide and tert-butyl hydroperoxide-induced toxicity in HepG2 and CaCo-2 human cell lines: J.A. Woods, et al.; In Vitr. Mol. Toxicol. **14,** 233 (2001) ▪ Antioxidant, cyclooxygenase and topoisomerase inhibitory compounds from Apium graveolens Linn. seeds: R.A. Momin & M.G. Nair; Phytomedicine **9,** 312 (2002)

(E)-Capsaicin

ALX-550-066-M100 100 mg

Isolated from Capsicum fruit. Constituent of cayenne pepper. Powerful excitant of peripheral sensory nerve endings, specifically unmyelinated afferent neurons (C-fibers). Elicits pain by activating the vanilloid receptor subtype 1 (VR1). Chemoprotective against some chemical carcinogens and mutagens. Reversibly inhibits aggregation of platelets.

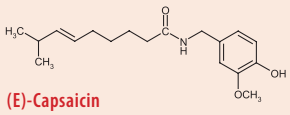
LIT: Capsaicin: identification, nomenclature, and pharmacotherapy: G.A. Cordell & O.E. Araujo; Ann. Pharmacother. **27,** 330 (1993) ▪ Capsaicin, a double-edged sword: toxicity, metabolism, and chemopreventive potential: Y. J. Surh & S. S. Lee; Life Sci. **56,** 1845 (1995) ▪ Topical capsaicin. A review of its pharmacological properties and therapeutic potential in post-herpetic neuralgia, diabetic neuropathy and osteoarthritis: C. Rains & H. M. Bryson; Drugs Aging **7,** 317 (1995) ▪ Peppers and pain. The promise of capsaicin: B. M. Fusco & M. Giacovazzo; Drugs 53, 909 (1997) ▪ Capsaicin sensitive-sensory nerves and blood pressure regulation: P. Vaishnava & D.H. Wang; Curr. Med. Chem. Cardiovasc. Hematol. Agents **1,** 177 (2003) ▪ Forty years in capsaicin research for sensory pharmacology and physiology: J. Szolcsanyi; Neuropeptides **38,** 377 (2004)

Dihydrocapsaicin

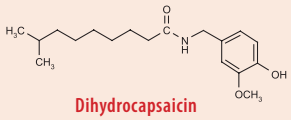
ALX-350-052-M010 10 mg
ALX-350-052-M050 50 mg

Isolated from Capsicum fruit. Dihydro-analog and congener of capsaicin (Prod. No. ALX-550-066) in chili peppers (Capsicum). Like capsaicin it is irritant. Dihydrocapsaicin accounts for about 22% of the total capsaicinoids mixture and has about the same pungency as capsaicin. Antioxidant. Reduces oxidation of serum lipids. Mutagenic.

LIT: The mutagenicity of capsaicin and dihydrocapsaicin in V79 cells: T. Lawson & P. Gannett; Cancer Lett. **48,** 109 (1989) ▪ Dihydrocapsaicin treatment depletes peptidergic nerve fibers of substance P and alters mast cell density in the respiratory tract of neonatal sheep: R. Ramirez-Romero, et al.; Regul. Pept. **91,** 97 (2000) ▪ Oxidative DNA damage by capsaicin and dihydrocapsaicin in the presence of Cu(II): S. Singh, et al.; Cancer Lett. **169,** 139 (2001) ▪ Determination of capsaicin and dihydrocapsaicin in capsicum fruits by liquid chromatography-electrospray/time-of-flight mass spectrometry: A. Garces-Claver, et al.; J. Agric. Food Chem. **54,** 9303 (2006) ▪ Effects of capsaicin, dihydrocapsaicin, and curcumin on copper-induced oxidation of human serum lipids: K.D. Ahuja, et al.; J. Agric. Food Chem. **54,** 6436 (2006)



(E)-Capsaicin



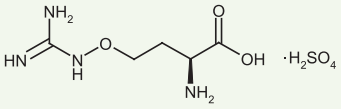
Dihydrocapsaicin

Canavanine . sulfate

ALX-350-002-M100 100 mg
ALX-350-002-M500 500 mg

The non-protein amino acid L-canavanine is an analog of L-arginine which has been shown to be a selective inhibitor of iNOS (NOS II). It induces apoptotic cell death, and shows antiproliferative and immunotoxic effects.

LIT: Inhibition of the growth of human pancreatic cancer cells by the arginine antimetabolite L-canavanine: D.S. Swaffar, et al.; Cancer Res. **54,** 6045 (1994) ▪ Inhibition of nitric oxide formation with L-canavanine attenuates endotoxin-induced vascular hyporeactivity in the rat: M. Cai, et al.; Eur. J. Pharmacol. **295,** 215 (1996) ▪ L-Canavanine modulates cellular growth, chemosensitivity and P-glycoprotein substrate accumulation in cultured human tumor cell lines: D.R. Worthen, et al.; Cancer Lett. **132,** 229 (1998) ▪ The antiproliferative and immunotoxic effects of L-canavanine and L-canaline: A.K. Bence, et al.; Anticancer Drugs **13,** 313 (2002) ▪ Arginine antimetabolite L-canavanine induces apoptotic cell death in human Jurkat T cells via caspase-3 activation regulated by Bcl-2 or Bcl-xL: M.H. Jang, et al.; BBRC **295,** 283 (2002) ▪ L-Canavanine as a radiosensitization agent for human pancreatic cancer cells: A.K. Bence, et al.; Mol. Cell Biochem. **244,** 37 (2003) ▪ Comparative effects of vasopressin, norepinephrine, and L-canavanine, a selective inhibitor of inducible nitric oxide synthase, in endotoxic shock: B. Levy, et al.; Am. J. Physiol. Heart Circ. Physiol. **287,** H209 (2004) ▪ L-arginine analogs as alternate substrates for nitric oxide synthase: S.D. Luzzi & M.A. Marletta; Bioorg. Med. Chem. Lett. **15,** 3934 (2005) ▪ Role of non-protein amino acid L-canavanine in autoimmunity: J. Akaogi, et al.; Autoimmun. Rev. **5,** 429 (2006)



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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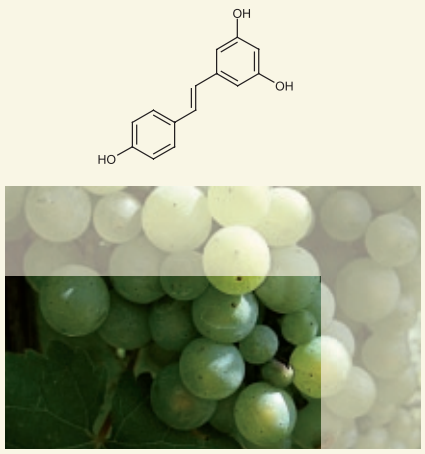


Auraptene

[7-Geranyloxycoumarin]

ALX-350-361-M005 5 mg
ALX-350-361-M025 25 mg

Isolated from citrus fruit. Anti-inflammatory and chemopreventive compound. Exerts tumor preventive effects through apoptosis. Suppresses cell proliferation and lipid peroxidation. Acts as an agonist of PPARs. Induces phase II drug-metabolizing enzymes.

LIT: Citrus auraptene exerts dose-dependent chemopreventive activity in rat large bowel tumorigenesis: the inhibition correlates with suppression of cell proliferation and lipid peroxidation and with induction of phase II drug-metabolizing enzymes: T. Tanaka, et al.; Cancer Res. **58,** 2550 (1998) ▪ Immunomodulatory action of citrus auraptene on macrophage functions and cytokine production of lymphocytes in female BALB/c mice: T. Tanaka, et al.; Carcinogenesis **20,** 1471 (1999) ▪ Synthesis and anti-inflammatory activity of natural and semisynthetic geranyloxycoumarins: M. Curini, et al.; Bioorg. Med. Chem. Lett. **14,** 2241 (2004) ▪ Citrus auraptene targets translation of MMP-7 (matrilysin) via ERK1/2-dependent and mTOR-independent mechanism: K. Kawabata, et al.; FEBS Lett. **580,** 5288 (2006) ▪ Citrus auraptene acts as an agonist for PPARs and enhances adiponectin production and MCP-1 reduction in 3T3-L1 adipocytes: K. Kuroyanagi, et al.; BBRC **366,** 219 (2008)

Diosmin

[3′,5,7-Trihydroxy-4′-methoxyflavone 7-rutinoside]

ALX-385-031-G005 5 g
ALX-385-031-G025 25 g

Isolated from *Citrus aurantium* L. and *Citrus reticulate Blanca*. Flavonoid glycoside. Main component in citrus fruits. Phlebotropic drug used to control internal symptoms of hemorrhoids and in the treatment of venous diseases. Prolongs the vasoconstrictor effect of noradrenaline on the vein wall. Reduces venous hyperpressure. Reduces capillary hyperpermeability and the expression of endothelial adhesion molecules (ICAM1, VCAM1). Effectively inhibits the P-glycoprotein (Pgp)-mediated efflux in cells. Anti-inflammatory. Inhibits lipopolysaccharide (LPS)-induced endothelial cytotoxicity.

LIT: Amine uptake inhibition by diosmin and diosmetin in human neuronal and neuroendocrine cell lines: E. Sher, et al.; Pharmacol. Res. **26,** 395 (1992) ▪ Clinical trial of oral diosmin (Daflon) in the treatment of hemorrhoids: W. Thanapongsathorn & T. Vajrabukka; Dis. Colon Rectum **35,** 1085 (1992) ▪ Antioxidant activity of micronized diosmin on oxygen species from stimulated human neutrophils: B. Cypriani, et al.; Biochem. Pharmacol. **45,** 1531 (1993) ▪ Diosmin and diosmetin are agonists of the aryl hydrocarbon receptor that differentially affect cytochrome P450 1A1 activity: H.P. Ciolino, et al.; Cancer Res. **58,** 2754 (1998) ▪ Inhibition of lipopolysaccharide (LPS)-induced endothelial cytotoxicity by diosmin: M.F. Melzig & R. Loose; Pharmazie **54,** 298 (1999) ▪ Anti-inflammatory activity of diosmin and hesperidin in rat colitis induced by TNBS: M.E. Crespo, et al.; Planta Med. **65,** 651 (1999) ▪ Treatment of metastatic melanoma B16F10 by the flavonoids tangeretin, rutin, and diosmin: C. Martinez Conesa, et al.; J. Agric. Food Chem. **53,** 6791 (2005)

(±)-Hesperetin

ALX-385-011-G001 1 g

Antioxidant flavonoid. Induces G1-phase cell cycle arrest. Anti-inflammatory. Suppresses NF-κB activation. Reduces cholesterol biosynthesis. Inhibits lipid peroxidation. Has neuroprotective effects against neuronal oxidative damage.

LIT: Structure-antioxidant activity relationships of flavonoids and phenolic acids: C.A. Rice-Evans, et al.; Free Radical Biol. & Med. **20,** 933 (1996) ▪ Antioxidant and neuroprotective effects of hesperidin and its aglycone hesperetin: J. Cho; Arch. Pharm. Res. **29,** 699 (2006) ▪ Modulation of the age-related nuclear factor-kappaB (NF-kappaB) pathway by hesperetin: J. Y. Kim, et al.; Aging Cell **5,** 401 (2006) ▪ Hesperetin Induced G1-Phase Cell Cycle Arrest in Human Breast Cancer MCF-7 Cells: Involvement of CDK4 and p21: E.J. Choi; Nutr. Cancer **59,** 115 (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)

(±)-Naringenin

[(±)-4′,5,7-Trihydroxyflavanone]

ALX-385-010-G001 1 g

Antioxidant flavonoid. Has anti-inflammatory and antitumor properties. Induces apoptosis. Stimulates DNA repair following oxidative damage. Inhibits the activity of phosphoinositide 3-kinase (PI(3)K).

LIT: Structure-antioxidant activity relationships of flavonoids and phenolic acids: C.A. Rice-Evans, et al.; Free Radical Biol. & Med. **20,** 933 (1996) ▪ Naringenin inhibits phosphoinositide 3-kinase activity and glucose uptake in 3T3-L1 adipocytes: A. W. Harmon & Y. M. Patel; BBRC **305,** 229 (2003) ▪ The citrus flavonoid naringenin stimulates DNA repair in prostate cancer cells: K. Gao, et al.; J. Nutr. Biochem. **17,** 89 (2006) ▪ Naringenin-induced apoptosis via activation of NF-kappaB and necrosis involving the loss of ATP in human promyelocytic leukemia HL-60 cells: S. Kanno, et al.; Toxicol. Lett. **166,** 131 (2006) ▪ Inhibitory effect of naringenin chalcone on inflammatory changes in the interaction between adipocytes and macrophages: S. Hirai, et al.; Life Sci. **81,** 1272 (2007)

Nomilin

ALX-350-228-M025 25 mg

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

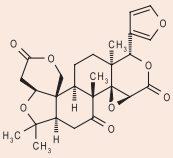
LIT: The effect of citrus limonoids on hamster buccal pouch carcinogenesis: E.G. Miller, et al.; Carcinogenesis **10,** 1535 (1989)

Tangeretin

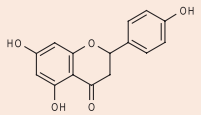
ALX-385-027-M010 10 mg

Flavonoid found in the peel of citrus fruits where it provides natural resistance to fungi. Induces G1 cell cycle arrest in cancer cells. Counteracts tumor promoter-induced inhibition of intercellular communication and inhibits cell proliferation in several cancer lines. Reduces elevation of blood pressure and plasma glucose levels.

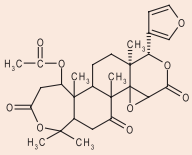
LIT: Nobiletin Is Main Fungistat in Tangerines Resistant to Mal Secco: A. Ben-Aziz; Science **155,** 1026 (1967) ▪ Flavonoids (apigenin, tangeretin) counteract tumor promoter-induced inhibition of intercellular communication of rat liver epithelial cells: C. Chaumontet, et al.; Cancer Lett. **114,** 207 (1997) ▪ Antiproliferative activity of flavonoids on several cancer cell lines: S. Kawaii; Biosci. Biotechnol. Biochem. **63,** 896 (1999) ▪ Tangeretin inhibits extracellular-signal-regulated kinase (ERK) phosphorylation: S. Van Slambrouck, et al.; FEBS Lett. **579,** 1665 (2005) ▪ Tangeretin suppresses IL-1beta-induced cyclooxygenase (COX)-2 expression through inhibition of p38 MAPK, JNK, and AKT activation in human lung carcinoma cells: K.H. Chen, et al.; Biochem. Pharmacol. **73,** 215 (2007) ▪ Tangeretin and nobiletin induce G1 cell cycle arrest but not apoptosis in human breast and colon cancer cells: K.L. Morley, et al.; Cancer Lett. **251,** 168 (2007)



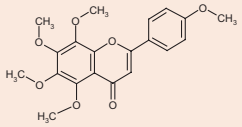
Limonin



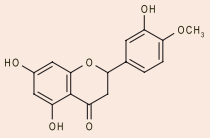
(±)-Naringenin



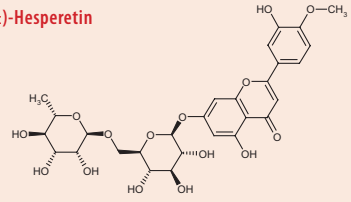
Nomilin



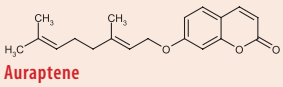
Tangeretin



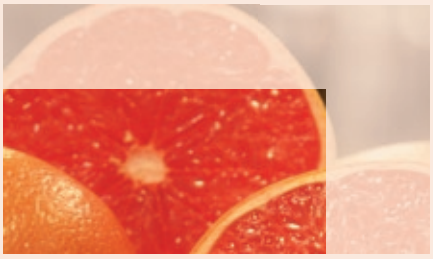
(±)-Hesperetin



Diosmin



Auraptene



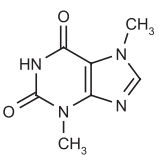
Theobromine

[3,7-Dimethylxanthine]

ALX-480-061-G005 5 g
ALX-480-061-G025 25 g

Weak phosphodiesterase inhibitor and adenosine receptor blocker. Diuretic and smooth-muscle relaxant.

LIT: Subclasses of adenosine receptors in the central nervous system: interaction with caffeine and related methylxanthines: J.W. Daly, et al.; Cell Mol. Neurobiol. **3,** 69 (1983) ▪ Characterization of the A2 adenosine receptor labeled by [3H]NECA in rat striatal membranes: R.F. Bruns, et al.; Mol. Pharmacol. **29,** 331 (1986)



Cafestol

ALX-350-220-M050 50 mg

Kahweol

ALX-350-223-M010 10 mg

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)

Caffeic acid

[3-(3,4-Dihydroxyphenyl)-2-propenoic acid]

ALX-270-231-M250 250 mg
ALX-270-231-G001 1 g

Synthetic. Naturally occuring phenolic compound found in many fruits, vegetables and herbs, including coffee. Shows anti-tumor, antiviral, antioxidant and anti-inflammatory effects. Inhibitor of 5- and 12-lipoxygenase (LO).

LIT: Caffeic acid is a selective inhibitor for leukotriene biosynthesis: Y. Koshihara, et al.; Biochim. Biophys. Acta **792,** 92 (1984) ▪ Caffeic acid derivatives: in vitro and in vivo anti-inflammatory properties: F.M. da Cunha, et al.; Free Radic. Res. **38,** 1241 (2004) ▪ Novel and therapeutic effect of caffeic acid and caffeic acid phenyl ester on hepatocarcinoma cells: complete regression of hepatoma growth and metastasis by dual mechanism: T.W. Chung, et al.; FASEB J. **18,** 1670 (2004) ▪ Anti-HIV activities of natural antioxidant caffeic acid derivatives: toward an antiviral supplementation diet: F. Bailly & P. Cotelle; Curr. Med. Chem. **12,** 1811 (2005)

Caffeine

ALX-550-322-G005 5 g

Found in tea leaves, coffee beans, cocoa beans, maté leaves, guarana paste and kola nuts. CNS stimulant. Blocks adenosine A1 and A2A receptors. cAMP phosphodiesterase inhibitor. Interferes with the uptake and storage of Ca^{2+} by the sarcoplasmic reticulum in skeletal muscle. Prevents apoptosis and cell cycle effects induced by various chemicals. Inhibits cellular DNA repair mechanisms. Anti-inflammatory.

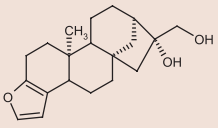
LIT: Analogues of caffeine and theophylline: effect of structural alterations on affinity at adenosine receptors: J.W. Daly, et al.; J. Med. Chem. **29,** 1305 (1986) ▪ Multiple effects of caffeine on calcium current in rat ventricular myocytes: I. Zahradnik & P. Palade; Pfluegers Arch. **424,** 129 (1993) ▪ Caffeine as an analgesic adjuvant: a review of pharmacology and mechanisms of action: J. Sawynok & T.L. Yaksh; Pharmacol. Rev. **45,** 43 (1993) ▪ Caffeine prevents apoptosis and cell cycle effects induced by camptothecin or topotecan in HL-60 cells: F. Traganos, et al.; Cancer Res. **53,** 4613 (1993) ▪ Immunomodulatory effects of caffeine: friend or foe: L. A. Horrigan, et al.; Pharmacol. Ther. **111,** 877 (2006) * Novel neuroprotection by caffeine and adenosine A(2A) receptor antagonists in animal models of Parkinson's disease: A. Kalda, et al.; J. Neurol. Sci. **248,** 9 (2006) ▪ The enigmatic effects of caffeine in cell cycle and cancer: A. M. & Bode and Z. Dong; Cancer Lett. **247,** 26 (2007)

Chlorogenic acid

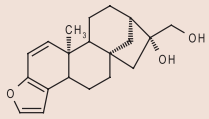
ALX-350-353-M500 500 mg
ALX-350-353-G001 1 g

Isolated from the leaves and fruits of dicotyledonous plants (e.g. coffee beans). Analog of caffeic acid (Prod. No. ALX-270-231). Shows antioxidant, analgesic, antipyretic and chemopreventive activity. Inhibits Bcr-Abl tyrosine kinase and triggers MAP kinases p38–dependent apoptosis. Inhibitor of the tumor promoting activity of phorbol esters. Does not inhibit the 5-lipoxygenase activity of ionophore-stimulated human polymorphonuclear leukocytes at concentrations as high as 100µM.

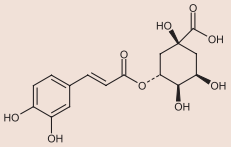
LIT: Inhibitory effect of curcumin, chlorogenic acid, caffeic acid, and ferulic acid on tumor promotion in mouse skin by 12-O-tetradecanoylphorbol-13-acetate: M.T. Huang, et al.; Cancer Res. **48,** 5941 (1988) ▪ Chlorogenic acid inhibits Bcr-Abl tyrosine kinase and triggers p38 mitogen-activated protein kinase-dependent apoptosis in chronic myelogenous leukemic cells: G. Bandyopadhyay, et al.; Blood **104,** 2514 (2004) ▪ Inhibition of activator protein-1, NF-kappaB, and MAPKs and induction of phase 2 detoxifying enzyme activity by chlorogenic acid: R. Feng, et al.; J. Biol. Chem. **280,** 27888 (2005) ▪ Evaluation of the anti-inflammatory, analgesic and antipyretic activities of the natural polyphenol chlorogenic acid: M.D. dos Santos, et al.; Biol. Pharm. Bull. **29,** 2236 (2006) ▪ Inhibition of DNA methylation by caffeic acid and chlorogenic acid, two common catechol-containing coffee polyphenols: W.J. Lee & B.T. Zhu; Carcinogenesis **27,** 269 (2006) ▪ The chemopreventive properties of chlorogenic acid reveal a potential new role for the microsomal glucose-6-phosphate translocase in brain tumor progression: A. Belkaid, et al.; Cancer Cell Int. **6,** 7 (2006)



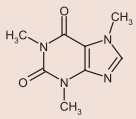
Cafestol



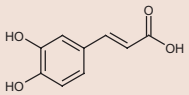
Kahweol



Chlorogenic acid



Caffeine



Caffeic acid

8-Isopentenylnaringenin

[8-Prenylnaringenin]

ALX-385-025-M005 5 mg

Isolated from hops *(Humulus lupulus L.)*. Phytoestrogen. Selective, non-steroidal estrogen receptor α (ERα) ligand. Potent inhibitor of angiogenesis *in vitro* and *in vivo*. Chemopreventive agent against cancer induced by heterocyclic amines.

LIT: Prenylflavonoids: a new class of non-steroidal phytoestrogen (Part 2). Estrogenic effects of 8-isopentenylnaringenin on bone metabolism: M. Miyamoto, et al.; Planta Med. **64,** 516 (1998) ▪ Prenylflavonoids: a new class of non-steroidal phytoestrogen (Part 1). Isolation of 8-isopentenylnaringenin and an initial study on its structure-activity relationship: M. Kitaoka, et al.; Planta Med. **64,** 511 (1998) ▪ Identification of a potent phytoestrogen in hops (Humulus lupulus L.) and beer: S.R. Milligan, et al.; J. Clin. Endocrinol. Metab. **84,** 2249 (1999) ▪ The endocrine activities of 8-prenylnaringenin and related hop (Humulus lupulus L.) flavonoids: S.R. Milligan, et al.; J. Clin. Endocrinol. Metab. **85,** 4912 (2000) ▪ Xanthohumol and related prenylflavonoids from hops and beer: to your good health!: J.F. Stevens & J.E. Page; Phytochemistry **65,** 1317 (2004) ▪ 8-prenylnaringenin, a novel phytoestrogen, inhibits angiogenesis in vitro and in vivo: M.S. Pepper, et al.; J. Cell Physiol. **199,** 98 (2004) ▪ 8-Prenylnaringenin, inhibits estrogen receptor-alpha mediated cell growth and induces apoptosis in MCF-7 breast cancer cells: E. Brunelli, et al.; J. Steroid Biochem. Mol. Biol. **107,** 140 (2007)

Isoxanthohumol

ALX-350-279-M001 1 mg

Synthetic. Prenylated chalcone. Phytoestrogen. Induces apoptosis in mature adipocytes.

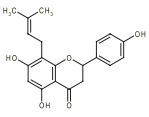
LIT: Xanthohumol and related prenylflavonoids from hops and beer: to your good health!: J.F. Stevens & J.E. Page; Phytochemistry **65,** 1317 (2004) ▪ Inhibition of endothelial cell functions by novel potential cancer chemopreventive agents: E. Bertl, et al.; BBRC **325,** 287 (2004) ▪ Metabolism of xanthohumol and isoxanthohumol, prenylated flavonoids from hops (Humulus lupulus L.), by human liver microsomes: D. Nikolic, et al.; J. Mass Spectrom. **40,** 289 (2005) ▪ Identification of human hepatic cytochrome P450 enzymes involved in the metabolism of 8-prenylnaringenin and isoxanthohumol from hops (Humulus lupulus L.): J. Guo, et al.; Drug Metab. Dispos. **34,** 1152 (2006) ▪ The prenylflavonoid isoxanthohumol from hops (Humulus lupulus L.) is activated into the potent phytoestrogen 8-prenylnaringenin in vitro and in the human intestine: S. Possemiers, et al.; J. Nutr. **136,** 1862 (2006) ▪ Effect of xanthohumol and isoxanthohumol on 3T3-L1 cell apoptosis and adipogenesis: J.Y. Yang, et al.; Apoptosis **12,** 1953 (2007)

Xanthohumol

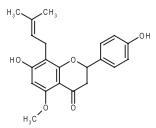
ALX-350-280-M005 5 mg

Isolated from hops *(Humulus lupulus)*. Prenylated chalcone found in beer. Potent inhibitor of diacylglycerol acetyltransferase [DGAT] [1], 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 [2]. Inhibits human P450 enzymes [3]. Induces quinone reductase in mouse Hepa 1c1c7 cells [4]. Inhibits the expression of HIF-1α and VEGF under hypoxic conditions [5]. For a review see [6]. Induces apoptosis in mature adipocytes [7].

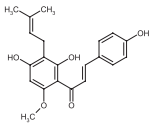
LIT: [1] Xanthohumols, diacylglycerol acyltransferase inhibitors, from Humulus lupulus: N. Tabata, et al.; Phytochemistry **46,** 683 (1997) ▪ [2] Antiproliferative and cytotoxic effects of prenylated flavonoids from hops (Humulus lupulus) in human cancer cell lines: C.L. Miranda, et al.; Food Chem. Toxicol. **37,** 271 (1999) ▪ [4] Prenylated chalcones and flavanones as inducers of quinone reductase in mouse Hepa 1c1c7 cells: C.L. Miranda, et al.; Cancer Lett. **149,** 21 (2000) ▪ [3] In vitro inhibition of human P450 enzymes by prenylated flavonoids from hops, Humulus lupulus: M.C. Henderson, et al.; Xenobiotica **30,** 235 (2000) ▪ [5] Cancer chemopreventive activity of Xanthohumol, a natural product derived from hop: C. Gerhauser, et al.; Mol. Cancer Ther. **1,** 959 (2002) ▪ [6] Xanthohumol and related prenylflavonoids from hops and beer: to your good health!: J.F. Stevens & J.E. Page; Phytochemistry **65,** 1317 (2004) ▪ Effect of xanthohumol and isoxanthohumol on 3T3-L1 cell apoptosis and adipogenesis: J.Y. Yang, et al.; Apoptosis **12,** 1953 (2007)



8-Isopentenylnaringenin



Isoxanthohumol



Xanthohumol

Daidzein

[4′,7-Dihydroxyisoflavone]

ALX-350-009-M010	10 mg
ALX-350-009-M025	25 mg
ALX-350-009-M050	50 mg

Synthetic. Inactive analog of the tyrosine kinase inhibitor genistein (Prod. No. ALX-350-006). Consumption decreases circulating levels of TNF-α in postmenopausal women. Shows antiinflammatory effect.

LIT: Genistein, a specific inhibitor of tyrosine-specific protein kinases: T. Akiyama, et al.; J. Biol. Chem. **262,** 5592 (1987) ▪ Tyrosine kinase inhibitors block calcium channel currents in vascular smooth muscle cells: S. Wijetunge, et al.; BBRC **189,** 1620 (1992) ▪ Genistein and daidzein, and their ß-glycoside conjugates: anti-tumor isoflavones in soybean foods from American and Asian diets: L. Coward, et al.; J. Agric. Food Chem. **41,** 1961 (1993) ▪ Daidzein inhibits insulin- or insulin-like growth factor-1-mediated signaling in cell cycle progression of Swiss 3T3 cells: K. Higashi and H. Ogawara; Biochim. Biophys. Acta **1221,** 29 (1994) ▪ Gut bacterial metabolism of the soy isoflavone daidzein: exploring the relevance to human health: C. Atkinson, et al.; Exp. Biol. Med. (Maywood) **230,** 155 (2005) ▪ Clinical review: a critical evaluation of the role of soy protein and isoflavone supplementation in the control of plasma cholesterol concentrations: A. Dewell, et al.; J. Clin. Endocrinol. Metab. **91,** 772 (2006)

Daidzin

[Daidzein-7-O-glucoside]

ALX-350-248-M002	2 mg
ALX-350-248-M010	10 mg

Glucoside of the isoflavone daidzein (Prod. No. ALX-350-009) found in soy beans.

LIT: Metabolism of puerarin and daidzin by human intestinal bacteria and their relation to in vitro cytotoxicity: D.H. Kim, et al.; Biol. Pharm. Bull. **21,** 628 (1998) ▪ Daidzin and its antidipsotropic analogs inhibit serotonin and dopamine metabolism in isolated mitochondria: W.M. Keung & B.L. Vallee; PNAS **95,** 2198 (1998) ▪ Daidzein and genistein but not their glucosides are absorbed from the rat stomach: M.K. Piskula, et al.; FEBS Lett. **447,** 287 (1999)

Formononetin (high purity)

ALX-270-312-M005	5 mg

Interacts with human estrogen receptors with low potency. Enhances IL-4 production in a dose-dependent manner. Inhibits lecithin peroxidation induced by hydroxyl radicals. Selective inhibitor of the γ-isoform of alcohol dehydrogenase. Antioxidant.

LIT: Proliferative response of mammary glandular tissue to formononetin: W. Wang, et al.; Nutr. Cancer **23,** 131 (1995) ▪ Isoflavonoids and lignans have different potentials to modulate oxidative genetic damage in human colon cells: B.L. Pool-Zobel, et al.; Carcinogenesis **21,** 1247 (2000) ▪ Disposition of flavonoids via enteric recycling: enzyme-transporter coupling affects metabolism of biochanin A and formononetin and excretion of their phase II conjugates: X. Jia, et al.; J. Pharmacol. Exp. Ther. **310,** 1103 (2004) ▪ Formononetin, a phyto-oestrogen, and its metabolites up-regulate interleukin-4 production in activated T cells via increased AP-1 DNA binding activity: J. Park, et al.; Immunology **116,** 71 (2005)

Genistein (synthetic)

[4′,5,7-Trihydroxyisoflavone]

ALX-350-006-M010	10 mg
ALX-350-006-M025	25 mg
ALX-350-006-M050	50 mg
ALX-350-006-M100	100 mg
ALX-350-006-G001	1 g

Synthetic. Tyrosine protein kinase inhibitor. Inhibits phosphorylation of EGF receptor kinase. Inhibits tumor cell proliferation and induces tumor cell differentiation. Inhibits topoisomerase II activity *in vivo*. Produces cell cycle arrest and apoptosis. Direct inhibitor of insulin-induced glucose uptake in adipocytes (IC_{50}=20µM). Consumption of genistein decreases circulating levels of TNF-α in postmenopausal women.

LIT: Genistein, a specific inhibitor of tyrosine-specific protein kinases: T. Akiyama, et al.; J. Biol. Chem. **262,** 5592 (1987) ▪ Mechanisms of cancer chemoprevention by soy isoflavone genistein: F.H. Sarkar & Y. Li; Cancer Metastasis Rev. **21,** 265 (2002) ▪ Soy isoflavone phytopharmaceuticals in interleukin-6 affections. Multi-purpose nutraceuticals at the crossroad of hormone replacement, anti-cancer and anti-inflammatory therapy: N. Dijsselbloem, et al.; Biochem. Pharmacol. **68,** 1171 (2004) ▪ Genistein directly inhibits GLUT4-mediated glucose uptake in 3T3-L1 adipocytes: M. Bazuine, et al.; BBRC **325,** 511 (2005) ▪ Clinical review: a critical evaluation of the role of soy protein and isoflavone supplementation in the control of plasma cholesterol concentrations: A. Dewell, et al.; J. Clin. Endocrinol. Metab. **91,** 772 (2006) ▪ The role of genistein and synthetic derivatives of isoflavone in cancer prevention and therapy: F.H. Sarkar, et al.; Mini Rev. Med. Chem. **6,** 401 (2006)

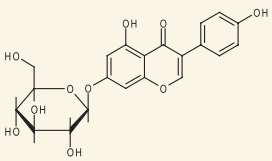
Genistin

[Genistein-7-O-glucoside]

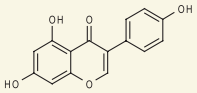
ALX-350-247-M010	10 mg

Glucoside of genistein (Prod. No. ALX-350-006) found in soy beans. Useful as a negative control for genistein and other tyrosine kinase inhibitors. Selective inhibitor of terminal deoxyribonucleotidyltransferase (TdT). Displays antioxidant and anticarcinogenic properties.

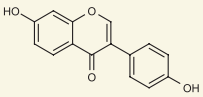
LIT: Soybean isoflavones, genistein and genistin, inhibit rat myoblast proliferation, fusion and myotube protein synthesis: S. Ji, et al.; J. Nutr. **129,** 1291 (1999) ▪ Inhibition of CYP1A1 enzyme activity in mouse hepatoma cell culture by soybean isoflavones: H.G. Shertzer, et al.; Chem. Biol. Interact. **123,** 31 (1999) ▪ Selective inhibitors of terminal deoxyribonucleotidyltransferase (TdT): baicalin and genistin: Y. Uchiyama, et al.; Biochim. Biophys. Acta **1725,** 298 (2005) ▪ Genistin inhibits UV light-induced plasmid DNA damage and cell growth in human melanoma cells: A. Russo, et al.; J. Nutr. Biochem. **17,** 103 (2006) ▪ Pro-apoptotic effect and cytotoxicity of genistein and genistin in human ovarian cancer SK-OV-3 cells: E.J. Choi, et al.; Life Sci. **80,** 1403 (2007)



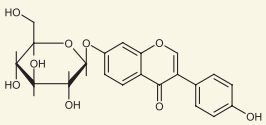
Genistin



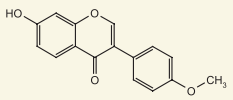
Genistein



Daidzein



Daidzin



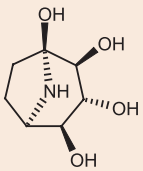
Formononetin

(+)-Calystegine B2

ALX-350-314-M001	1 mg
ALX-350-314-M005	5 mg

Isolated from *Lycopersicon sp*. Selective glycosidase inhibitor sharing such activity with other hydroxylated nitrogen containing bicyclic compounds like swainsonine (Prod. No. ALX-350-077), castanospermine (Prod. No. ALX-270-160), monocyclic deoxynojirimycin (Prod. No. ALX-580-003) or fagomine. Most abundant form is calystegine B2 occurring in almost all plants displaying calystegines. Inhibitory potency of calystegine B2 is comparable to other alkaloidal glycosidase inhibitors showing K_i values below 1µM.

LIT: Identification of the glycosidase inhibitors swainsonine and calystegine B2 in Weir vine (Ipomoea sp. Q6 [aff. calobra]) and correlation with toxicity: R.J. Molyneux, et al.; J. Nat. Prod. **58,** 878 (1995) ▪ The effects of calystegines isolated from edible fruits and vegetables on mammalian liver glycosidases: N. Asano, et al.; Glycobiology **70,** 1085 (1997) ▪ Synthesis and evaluation of calystegine B2 analoguesas glycosidase inhibitors: M.I. Garcia-Moreno, et al.; J. Org. Chem. **66,** 7604 (2001) ▪ Chemistry and biology of calystegines: B. Drager; Nat. Prod. Rep. **21,** 211 (2004) ▪ Calystegines in potatoes with genetically engineered carbohydrate metabolism: U. Richter, et al.; J. Exp. Bot. **58,** 1603 (2007)



Cinnamtannin B-1

ALX-350-365-M005 5 mg

Isolated from *Laurus nobilis* L. A-type proanthocyanidin. Has potent antioxidant activity. Protective agent against oxidative stress and apoptosis in human platelets. Reduces hyperaggregability in platelets from type 2 diabetic patients.

LIT: Pharmacological Studies on Linderae umbellatae Ramus, IV*. Effects of condensed tannin related compounds on peptic activity and stress-induced gastric lesions in mice: N. Ezaki, et al.; Planta Med. **51,** 34 (1985) ▪ Antitumor agents, 129. Tannins and related compounds as selective cytotoxic agents: Y. Kashiwada, et al.; J. Nat. Prod. **55,** 1033 (1992) ▪ Cinnamtannin B1 activity on adipocytes formation: M. Taher, et al.; Med. J. Malaysia **59,** 97 (2004) ▪ Phenolic constituents in the fruits of Cinnamomum zeylanicum and their antioxidant activity: G.K. Jayaprakasha, et al.; J. Agric. Food Chem. **54,** 1672 (2006) ▪ Cinnamtannin B-1 from bay wood reduces abnormal intracellular Ca2+ homeostasis and platelet hyperaggregability in type 2 diabetes mellitus patients: A. Bouaziz, et al.; Arch. Biochem. Biophys. **457,** 235 (2007) ▪ Cinnamtannin B-1 from bay wood exhibits antiapoptotic effects in human platelets: A. Bouaziz, et al.; Apoptosis **12,** 489 (2007) ▪ Characterization of the intracellular mechanisms involved in the antiaggregant properties of cinnamtannin B-1 from bay wood in human platelets: N. Ben Amor, et al.; J. Med. Chem. **50,** 3937 (2007)

Eugenol (high purity)

ALX-350-123-G001 1 g

Isolated from clove oil, nutmeg, cinnamon and bay leaf. TRPV1 agonist. Analgesic. Has antifungal, antimicrobial and antioxidant properties.

LIT: Activation of vanilloid receptor 1 (VR1) by eugenol: B.H. Yang, et al.; J. Dent. Res. **82,** 781 (2003) ▪ Study of anticandidal activity of carvacrol and eugenol in vitro and in vivo: N. Chami, et al.; Oral. Microbiol. Immunol. **20,** 106 (2005) ▪ A comparative study of the antioxidant/prooxidant activities of eugenol and isoeugenol with various concentrations and oxidation conditions: T. Atsumi, et al.; Toxicol. In Vitro **19,** 1025 (2005) ▪ Antimicrobial efficacy of eugenol microemulsions in milk against Listeria monocytogenes and Escherichia coli O157:H7: S. Gaysinsky, et al.; J. Food Prot. **70,** 2631 (2007)

Myristicin

ALX-350-227-M100 100 mg

Isolated from *Petroselinium hortense* Hoffmann. Natural product isolated from parsley oil. Inducer of glutathione S-transferases. Also inhibits chemical carcinogenesis. Induces rat and human cytochrome P450 enzymes. Has very potent hepatoprotective activity. Induces apoptosis.

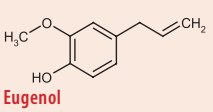
LIT: Myristicin: a potential cancer chemopreventive agent from parsley leaf oil: G.-Q. Zheng, et al.; J. Agri. Food Chem. **40,** 107 (1992) ▪ Inhibition of benzo[a]pyrene-induced tumorigenesis by myristicin, a volatile aroma constituent of parsley leaf oil: G.-Q. Zheng, et al.; Carcinogenesis **13,** 1921 (1992) ▪ Induction of rat hepatic cytochrome P450 enzymes by myristicin: H.G. Jeong & C.H. Yun; BBRC **217,** 966 (1995) ▪ Roles of human liver cytochrome P450 3A4 and 1A2 enzymes in the oxidation of myristicin: C.H. Yun, et al.; Toxicol. Lett. **137,** 143 (2003) ▪ Myristicin-induced neurotoxicity in human neuroblastoma SK-N-SH cells: B.K. Lee, et al.; Toxicol. Lett. **157,** 49 (2005)

Dihydromyristicin

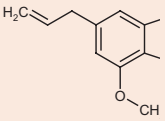
ALX-350-222-M100 100 mg

Hydrogenated product of myristicin (Prod. No. ALX-350-227), a natural constituent of parsley. Inducer of glutathione S-transferases.

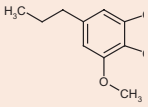
LIT: Myristicin: a potential cancer chemopreventive agent from parsley leaf oil: G.-Q. Zheng, et al.; J. Agri. Food Chem. **40,** 107 (1992) ▪ Inhibition of benzo[a]pyrene-induced tumorigenesis by myristicin, a volatile aroma constituent of parsley leaf oil: G.Q. Zheng, et al.; Carcinogenesis **13**, 1921 (1992)



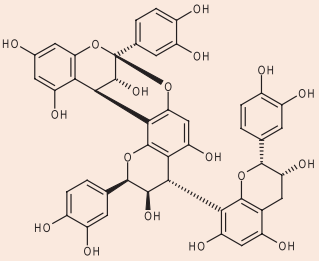
Eugenol



Myristicin



Dihydromyristicin



Cinnamtannin B-1

Delphinidin chloride (high purity)

ALX-385-028-M010 10 mg

Anthocyanidin with antioxidant effect found in pigmented fruits and vegetables. Shown to inhibit angiogenesis and endothelial cell apoptosis by stimulating nitric oxide (NO) production. Inhibits solar radiation (UVB)-mediated oxidative stress, reducing DNA damage.

LIT: Delphinidin, an active compound of red wine, inhibits endothelial cell apoptosis via nitric oxide pathway and regulation of calcium homeostasis: S. Martin, et al.; Br. J. Pharmacol. **139,** 1095 (2003) ▪ Anthocyanins induce cell cycle perturbations and apoptosis in different human cell lines: M.C. Lazzè; Carcinogenesis **25,** 1427 (2004) ▪ DNA interaction with naturally occurring antioxidant flavonoids quercetin, kaempferol, and delphinidin: C.D. Kanakis, et al.; J. Biomol. Struct. Dyn. **22,** 719 (2005) ▪ Delphinidin and cyanidin inhibit PDGF(AB)-induced VEGF release in vascular smooth muscle cells by preventing activation of p38 MAPK and JNK: M.H. Oak, et al.; Br. J. Pharmacol. **149,** 283 (2006) ▪ Delphinidin, a dietary anthocyanidin, inhibits vascular endothelial growth factor receptor-2 phosphorylation: S. Lamy, et al.; Carcinogenesis **27,** 989 (2006) ▪ elphinidin, an anthocyanidin in pigmented fruits and vegetables, protects human HaCaT keratinocytes and mouse skin against UVB-mediated oxidative stress and apoptosis: F. Afaq, et al.; J. Invest. Dermatol. **127,** 222 (2007)

Kaempferol

ALX-385-005-M010 10 mg
ALX-385-005-M050 50 mg

Antioxidant flavonoid. Apoptosis inducer. Reversible inhibitor of fatty acid synthase.

LIT: Presence of fatty acid synthase inhibitors in the rhizome of Alpinia officinarum hance: B.H. Li & W.X. Tian; J. Enzyme Inhib. Med. Chem. **18,** 349 (2003) ▪ Pharmacological inhibitors of Fatty Acid Synthase (FASN)--catalyzed endogenous fatty acid biogenesis: a new family of anti-cancer agents?: R. Lupu & J. A. Menendez; Curr. Pharm. Biotechnol. **7,** 483 (2006) (Review)

Myricetin

ALX-385-012-M010 10 mg
ALX-385-012-M050 50 mg

Antioxidant flavonoid. Has antitumor and chemopreventive properties. Anti-inflammatory. Inhibits NF-κB activation.

LIT: Biological effects of myricetin: K. C. Ong & H. E. Khoo; Gen. Pharmacol. **29,** 121 (1997) (Review) ▪ Suppression of TNFalpha-mediated NFkappaB activity by myricetin and other flavonoids through downregulating the activity of IKK in ECV304 cells: S. H. Tsai, et al.; J. Cell Biochem. **74,** 606 (1999) ▪ Mitochondrial-dependent, reactive oxygen species-independent apoptosis by myricetin: roles of protein kinase C, cytochrome c, and caspase cascade: C.H. Ko, et al.; Biochem. Pharmacol. **69,** 913 (2005) ▪ Inhibition of Mammalian thioredoxin reductase by some flavonoids: implications for myricetin and quercetin anticancer activity: J. Lu, et al.; Cancer Res. **66,** 4410 (2006) ▪ Myricetin is a novel natural inhibitor of neoplastic cell transformation and MEK1: K.W. Lee, et al.; Carcinogenesis **28,** 1918 (2007)

Quercetin . $2H_2O$

ALX-385-001-G005 5 g

Isolated from *Sophora japonica* L. Antioxidant flavonoid. Inhibitor of mitochondrial ATPase, cAMP- and cGMP-phosphodiesterases. Inhibitor of protein tyrosine kinases and protein kinase C (PKC). Induces apoptosis. Blocks cells at the G0/G1 interface. Activator of human deacetylase SIRT1. Reversible inhibitor of fatty acid synthase (FAS). Inhibits the production of the inflammatory mediators NO, TNF-α and IL-12 in activated macrophages.

LIT: Effects of quercetin and F1 inhibitor on mitochondrial ATPase and energy-linked reactions in submitochondrial particles: D.R. Lang & E. Racker; Biochim. Biophys. Acta **333,** 180 (1974) ▪ Flavonoid compounds are potent inhibitors of cyclic AMP phosphodiesterase: A. Beretz, et al.; Experientia **34,** 1054 (1978) ▪ Molecular mechanisms in the antiproliferative action of quercetin: B. Csokay, et al.; Life Sci. **60,** 2157 (1997) ▪ The effect of quercetin on induction of apoptosis: J. Rzymowska, et al.; Folia Histochem. Cytobiol. **37,** 125 (1999) ▪ Quercetin, coenzyme Q10, and L-canavanine as protective agents against lipid peroxidation and nitric oxide generation in endotoxin-induced shock in rat brain: H.M. Abd El-Gawad & A.E. Khalifa; Pharmacol. Res. **43,** 257 (2001) ▪ Pharmacological inhibitors of Fatty Acid Synthase (FASN)--catalyzed endogenous fatty acid biogenesis: a new family of anticancer agents?: R. Lupu & J. A. Menendez; Curr. Pharm. Biotechnol. **7,** 483 (2006) (Review) ▪ Onions: a source of unique dietary flavonoids: R. Slimestad, et al.; J. Agric. Food Chem. **55,** 10067 (2007)

Related Products

Cyanidin chloride

ALX-385-003-M010 10 mg
ALX-385-003-M050 50 mg

Isorhamnetin

ALX-385-024-M005 5 mg
ALX-385-024-M010 10 mg

Peonidin chloride

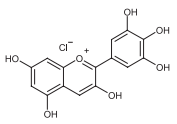
ALX-385-015-M005 5 mg

(±)-Taxifolin

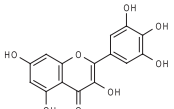
ALX-385-006-M010 10 mg
ALX-385-006-M050 50 mg

(+)-Taxifolin

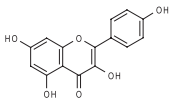
ALX-385-018-M010 10 mg
ALX-385-018-M050 50 mg



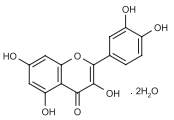
Delphinidin chloride



Myricetin



Kaempferol



Quercetin . $2H_2O$

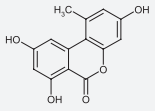
Mycotoxins

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.*

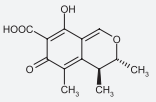
Their frequent presence in food and their severe toxic, carcinogenic and estrogenic properties have been recognized as potential threat to human health. A reliable risk assessment of mycotoxin contamination for humans and animals relies basically on their unambiguous identification and accurate quantification 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

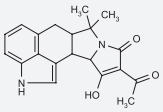
The toxicology of mycotoxins: Y. Ueno; Crit. Rev. Toxicol. **14,** 99 (1985) ▪ DNA damage by mycotoxins: J.S. Wang & J.D. Groopman; Mutat. Res. **424,** 167 (1999) ▪ Nutritional and health implications of mycotoxins in animal feeds: A review: K.E. Akande, et al.; Pakistan J. Nutr. **5,** 398 (2006) ▪ 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) ▪ Some major mycotoxins and their mycotoxicoses--an overview: J.L. Richard; Int J. Food Microbiol. **119,** 3 (2007) ▪ Mycotoxins in the food chain: human health implications: W.L. Bryden; Asia Pac. J. Clin. Nutr. **16 Suppl 1,** 95 (2007) ▪ Mixtures in the real world: the importance of plant self-defense toxicants, mycotoxins, and the human diet: J.L. Mattsson; Toxicol. Appl. Pharmacol. **223,** 125 (2007)



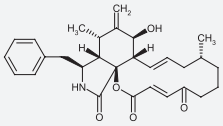
Alternariol



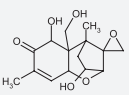
Citrinin



Cyclopiazonic acid



Cytochalasin A



Deoxynivalenol

Alternariol

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

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

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)

Cytochalasin A

ALX-380-057-M001	1 mg
ALX-380-057-M005	5 mg
ALX-380-057-M010	10 mg

Isolated from *Helminthosporium dematioideum*. Fungal toxin. Inhibits glucose transport, actin polymerisation and blocks the formation of microtubuli. Inhibits cell division. Inhibits HIV-1 protease.

LIT: The action of cytochalasin A on the in vitro polymerization of brain tubulin and muscle G-actin: R.H. Himes & L.L. Houston; J. Supramol. Struct. **5,** 81 (1976) ▪ Cytochalasin A inhibits B-lymphocyte capping and activation by antigens: G. Teti, et al.; Immunol. Lett. **3,** 151 (1981) ▪ L-696,474, a novel cytochalasin as an inhibitor of HIV-1 protease. III. Biological activity: R.B. Lingham, et al.; J. Antibiot. **45,** 686 (1992) ▪ Effect of cytochalasin A on apical growth, actin cytoskeleton organization and enzyme secretion in Aspergillus nidulans: S. Torralba, et al.; Microbiology **144 (Pt 1),** 45 (1998)

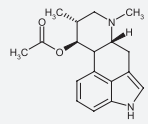
NEW Deoxynivalenol

ALX-630-115-M001	1 mg
ALX-630-115-M005	5 mg

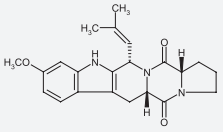
Isolated from *Trichoderma viride*. Mycotoxin found in cereals. Binds to the ribosome and inhibits protein synthesis.

LIT: Simultaneous detection of several Fusarium mycotoxins in cereals, grains, and foodstuffs: H. Kamimura, et al.; J. Assoc. Off. Anal. Chem. **64,** 1067 (1981) ▪ The ability to detoxify the mycotoxin deoxynivalenol colocalizes with a major quantitative trait locus for Fusarium head blight resistance in wheat: M. Lemmens, et al.; Mol. Plant Microbe Interact. **18,** 1318 (2005) ▪ Accumulation of deoxynivalenol and its 15-acetylated form is significantly modulated by oxidative stress in liquid cultures of Fusarium graminearum: N. Ponts, et al.; FEMS Microbiol. Lett. **258,** 102 (2006) ▪ Effect of the Fusarium toxin deoxynivalenol (DON) on IgA, IgM and IgG concentrations and proliferation of porcine blood lymphocytes: T. Goyarts, et al.; Toxicol. In Vitro **20,** 858 (2006) ▪ Deoxynivalenol transport across human intestinal Caco-2 cells and its effects on cellular metabolism at realistic intestinal concentrations: T. Sergent, et al.; Toxicol. Lett. **164,** 167 (2006) ▪ Effects of feeding deoxynivalenol contaminated wheat on growth performance, organ weights and histological parameters of the intestine of broiler chickens: W.A. Awad, et al.; J. Anim. Physiol. Anim. Nutr. (Berl) **90,** 32 (2006) ▪ Cytotoxicity, metabolism and cellular uptake of the mycotoxin deoxynivalenol in human proximal tubule cells and lung fibroblasts in primary culture: M. Königs, et al.; Toxicology **240,** 48 (2007)▪ Ribotoxic mycotoxin deoxynivalenol induces G(2)/M cell cycle arrest via p21(Cip/WAF1) mRNA stabilization in human epithelial cells: H. Yang, et al.; Toxicology **243,** 145 (2008)

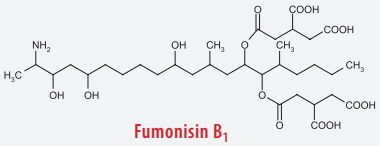
ALEXIS® BIOCHEMICALS



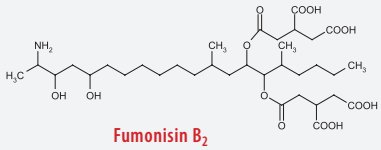
Fumigaclavine A



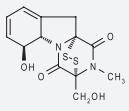
Fumitremorgin C



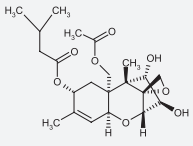
Fumonisin B_1



Fumonisin B_2

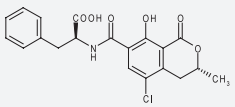


Gliotoxin

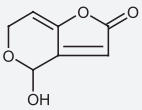


HT-2 Toxin

Moniliformin . Na

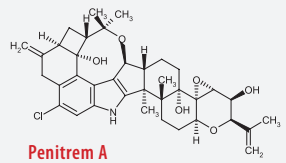


Ochratoxin A



Patulin

Paxilline



Penitrem A

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)

NEW Fumitremorgin C

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)

Gliotoxin

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 HT-2 Toxin

ALX-630-113-M001 1 mg
ALX-630-113-M005 5 mg

Semisynthetic, derived from T2 toxin from *Fusarium tricinctum*. Trichothecene group mycotoxin. Induces apoptosis

LIT: Structure-function relationship of T-2 toxin and its metabolites in inducing thymic apoptosis in vivo in mice: Z. Islam, et al.; Biosci. Biotechnol. Biochem. **62,** 1492 (1998) ▪ Mechanisms involved in the induction of apoptosis by T-2 and HT-2 toxins in HL-60 human promyelocytic leukemia cells: J.A. Holme, et al.; Cell Biol. Toxicol. **19,** 53 (2003) ▪ A practical method for measuring deoxynivalenol, nivalenol, and T-2 + HT-2 toxin in foods by an enzyme-linked immunosorbent assay using monoclonal antibodies: T. Yoshizawa, et al.; Biosci. Biotechnol. Biochem. **68,** 2076 (2004)

NEW Moniliformin . 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

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)

NEW Roquefortine C

ALX-350-342-MC05 0.5 mg

Isolated from *Gymnoascus reesii* MST-FP1700. Potent neurotoxin produced by a diverse range of fungi, most notably Penicillium species. Mycotoxin. 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) ▪ Antimicrobial action of roquefortine: B. Kopp-Holtwiesche and H.J. Rehm; J. Environ. Pathol. Toxicol. Oncol. **10,** 41 (1990) ▪ Molecular requirements for inhibition of cytochrome p450 activities by roquefortine: C. Aninat, et al.; Chem. Res. Toxicol. **14,** 1259 (2001) ▪ The effects of the Penicillium mycotoxins citrinin, cyclopiazonic acid, ochratoxin A, patulin, penicillic acid, and roquefortine C on in vitro proliferation of porcine lymphocytes: M. Keblys, et al.; Mycopathologia **158,** 317 (2004)

NEW Roquefortine E

ALX-350-343-M001 1 mg

Isolated from *Gymnoascus reesii* MST-FP1700. Mycotoxin. Analog of roquefortine C (Prod. No. ALX-350-342). Selective, albeit weakly active antitumor agent.

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

NEW Stachybotrylactam

ALX-630-112-MC05 0.5 mg

Isolated from *Stachybotrys sp*. MST-FP1752. Mycotoxin. Immunosuppressive. Weakly inhibits HIV-1 protease.

LIT: Stachybotrys toxins. 1: B.B. Jarvis, et al.; Nat. Toxins **3,** 10 (1995) ▪ Novel spirodihydrobenzofuranlactams as antagonists of endothelin and as inhibitors of HIV-1 protease produced by Stachybotrys Sp. I. Fermentation, isolation and biological activity: B.E. Roggo, et al.; J. Antibiot. (Tokyo) **49,** 13 (1996) ▪ Enantioselective total synthesis and structure revision of spirodihydrobenzofuranlactam 1. Total synthesis of stachybotrylactam: A.S. Kende, et al.; Org. Lett. **5,** 1785 (2003)

NEW Sterigmatocystin

ALX-630-116-M001 1 mg
ALX-630-116-M005 5 mg

Isolated from *Aspergillus versicolor*. Mycotoxin produced by strains of the common molds. Inhibitor of DNA synthesis. Induces sister chromatid exchanges in bone marrow cells of mice. Causes necrosis. Has an inhibitory effect on orotic acid incorporation into nuclear RNA.

LIT: Effect of sterigmatocystin on rat liver nuclear RNA: W. Nel & H.E. Pretorius; Biochem. Pharmacol. **19,** 957 (1970) ▪ Massive and single cell necrosis in the rat liver induced by aflatoxin B1 and sterigmatocystin: K. Terao; Acta Pathol. Jpn. **23,** 647 (1973) ▪ Induction of sister-chromatid exchanges in vivo in mice by the mycotoxins sterigmatocystin and griseofulvin: P.T. Curry, et al.; Mutat. Res. **137,** 111 (1984) ▪ A novel biosensor for sterigmatocystin constructed by multi-walled carbon nanotubes (MWNT) modified with aflatoxin-detoxifizyme (ADTZ): D.S. Yao, et al.; Bioelectrochemistry **68,** 126 (2006)

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: Microbial metabolites with insecticidal properties: M. Cole & G.N. Rolinson; Appl. Microbiol. **24,** 660 (1972) ▪ Microbial production of tenuazonic acid analogues: S. Gatenbeck & J. Sierankiewicz; Antimicrob. Agents Chemother. **3,** 308 (1973) ▪ Inhibition of mouse skin tumor promotion by tenuazonic acid: M. Antony, et al.; Cancer Lett. **61,** 21 (1991)

T-2 Toxin

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.

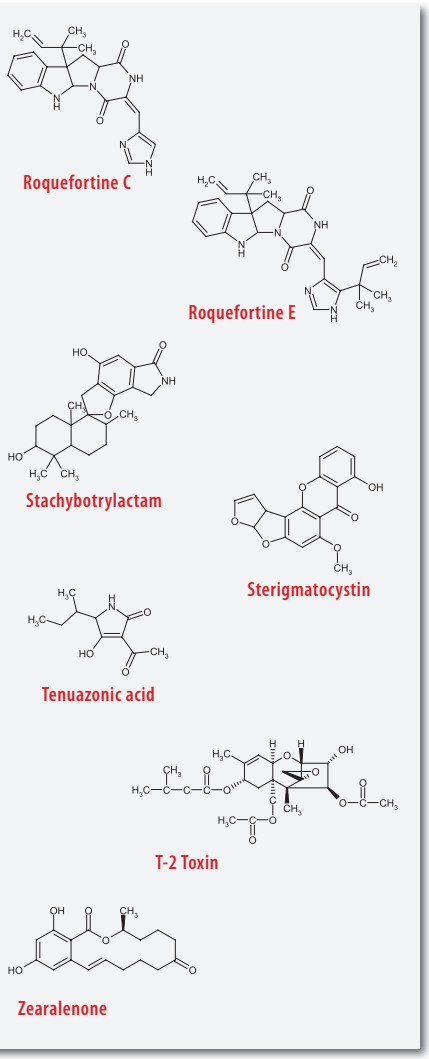
LIT: Apoptotic cellular damage in mice after T-2 toxin-induced acute toxicosis: T. Ihara, et al.; Nat. Toxins **5,** 141 (1997) ▪ T-2 toxin induces thymic apoptosis in vivo in mice: Z. Islam, et al.; Toxicol. Appl. Pharmacol. **148,** 205 (1998) ▪ T-2 toxin-induced apoptosis in hematopoietic tissues 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

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)



Aflatoxins

Aflatoxins were isolated and characterized in the early 1960s as the causative agent of turkey X disease, a hepatotoxic disease in turkey and other poultry. The main aflatoxins produced by *Aspergillus flavus* and *A. parasiticus* are B_1, B_2, G_1 and G_2, which contaminate a number of agricultural products such as peanuts, tree nuts, corn and cereal grains. Aflatoxins M_1 and M_2 are metabolites of the fungal aflatoxins found in animal tissues and fluids. Aflatoxins are hepatotoxic, immunosuppressive, carcinogenic and mutagenic. Aflatoxin B_1 (AFB_1) is the most prevalent and carcinogenic of the aflatoxins. Biotransformation plays a crucial role in the disposition, toxicity and carcinogenicity of AFB_1. Cytochrome P450, prostaglandin H synthase or lipoxygenase catalyze the formation of AFB_1-8,9-epoxide, which is capable of alkylating nucleic acids and proteins. Formation of DNA adducts subsequently leads to mutations, e. g. of the tumor suppressor gene p53.

LIT: Aflatoxin B1-induced DNA damage and its repair: L.L. Bedard and T.E. Massey; Cancer Lett. **241,** 174 (2006) ▪ Carcinogenic food contaminants: C.C. Abnet; Cancer Invest. **25,** 189 (2007) ▪ Synergistic interaction between aflatoxin B1 and hepatitis B virus in hepatocarcinogenesis: M.C. Kew; Liver Int. **23,** 405 (2003) ▪ Some major mycotoxins and their mycotoxicoses--an overview: J.L. Richard; Int. J. Food Microbiol. **119,** 3 (2007)

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

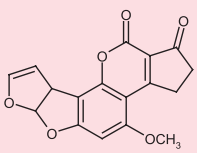
ALX-630-106-M001 1 mg
ALX-630-106-M005 5 mg

Aflatoxin M_1

ALX-630-095-MC01 0.1 mg

Aflatoxin M_2

ALX-630-114-MC01 0.1 mg



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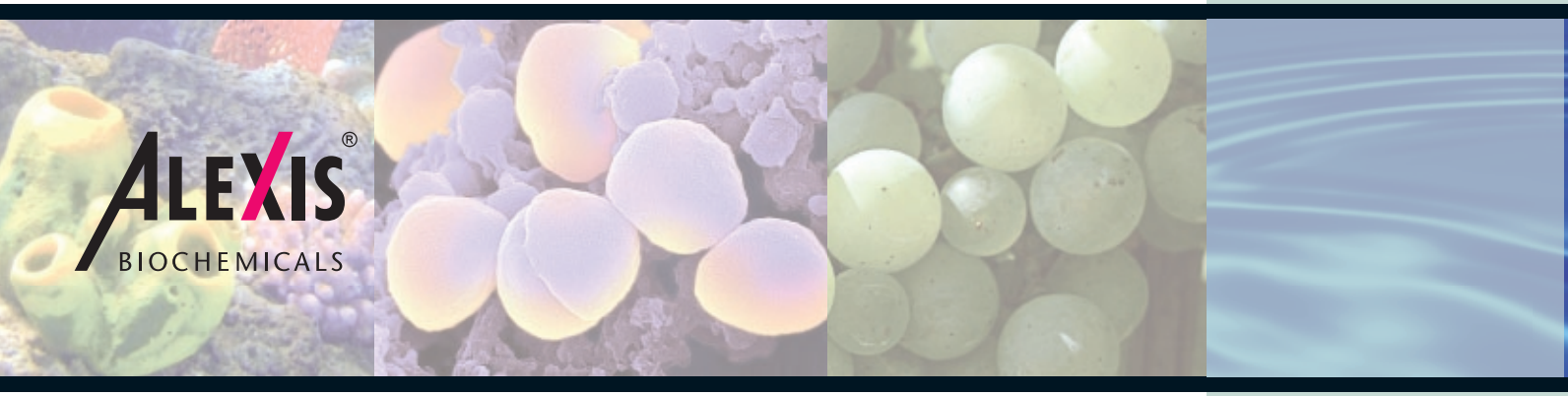

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