

Product Information

CYTOCHALASIN

Product Number **C6637, D1641, C6762, C0138, C8273, C1139, C0889, C2149**

Storage Temperature -20°C

CAS #: See table

Product Description

See Table 1

The Cytochalasins (Greek *cytos*, cell; *chalis*, relaxation) are a group of related fungal metabolites. They were discovered in 1964 during the screening of mold filtrates for possible biological activity on cells.¹ These fungal toxins are related by chemical structure. All are characterized by a highly substituted hydrogenated isoindole ring to which is fused a macrocyclic ring. The macrocyclic ring may vary from 11 to 14 atoms and may be either a carbocycle or lactone. These fungal toxins also share a number of unusual, interesting, and characteristic effects on the animal cell.

Cytochalasin B (Product No. C6762) is a metabolite of the fungus *Drechslera* (previously *Heiminthosporium dematioideum*). It was originally isolated from cultures of a *Phoma* species and, therefore, was sometimes referred to as phomin. Cytochalasin B is cell membrane permeable. It inhibits cell division by blocking formation of contractile microfilaments.^{1,2} It inhibits cell movement^{1,2} and induces nuclear extrusion.^{1,2,3,4} It shortens actin filaments by blocking monomer addition at the fast growing end of the polymer. It impairs maintenance of long term potentiation (LTP) of action filaments.^{5,32} It inhibits glucose transport^{6,7,8,33} and platelet aggregation.^{9,10,11,12} It blocks adenosine-induced apoptotic body formation without affecting activation of endogenous ADP-ribosylation in leukemia LH-60 cells.¹³

Dihydrocytochalasin B (dihydro-CB) (Product No. D1641), the saturated derivative of Cytochalasin B, induces changes in morphology and motility, but has little effect on sugar transport.^{14,15,16}

Dihydrocytochalasin B and its γ -lactone are useful probes for studying cytochalasin binding sites.^{17,18}

Dihydrocytochalasin B γ -lactone does not appear to have the same effects on cell motility and morphology as Cytochalasin B or Dihydrochhalasin B. Like Dihydrochhalasin B, the gamma-lactone does not appear to inhibit glucose transport.

Cytochalasin A (Product No. C6637) is a metabolite of the fungus *Drechslera* (previously *Heiminthosporium dematioideum*).¹⁹ Cytochalasin A is sulfhydryl-reactive. It was shown to inhibit growth and sugar uptake in a *Saccharomyces* strain.²⁰ Unlike Cytochalasin B, Cytochalasin C (Product No. C0138) and Cytochalasin D (Product No. C8273) are isomeric metabolites of *Metarrhizium anisopliae*.²¹ The cytochalasin D possesses antibiotic²² and antitumor²³ activity. It also impairs maintenance of long term potentiation (LTP) of actin filaments.³² It is implicated in promoting conditions favorable for depolymerizing actin.³⁴

Cytochalasin E (Product No. C2149) is a metabolite of *Rosellinia necatrix*.^{24,25} Cytochalasin E is unique in producing a "halo" around the nucleus more often than nuclear extrusion.⁴ Cytochalasin E is a inhibitor of angiogenesis and tumor growth.³⁰

Cytochalasin H (Product No. C0889) and Cytochalasin J (Product No. C1139) are metabolites of *Phomopsis paspali* found on *Paspalum scrobiculatum* Linn. (a millet consumed in India).^{26,27,28} Cytochalasins H and J have shown Central Nervous System activity.^{26,27,28} Cytochalasin J blocks or slows chromosome motion and affects spindle architecture.³¹

Disclaimer/Precautions

Cytochalasins are regarded as highly toxic and possible teratogens. Handle in a manner to avoid/minimize direct body contact and inhalation.

Preparation Instructions

Solubility

492 mg/ml in dimethylformamide at room temperature

371 mg/ml in dimethyl sulfoxide (DMSO) at room temperature

35 mg/ml in ethanol at room temperature

10 mg/ml in acetone at room temperature

Essentially insoluble in water

It is advisable to make a 1000X stock solution in DMSO (the final concentration of DMSO in the aqueous medium should not exceed 0.1% because greater DMSO concentrations can adversely affect many cultured cells). Dilute the stock in the appropriate aqueous medium to provide a physiologically acceptable final concentration (must be within the low

solubility limit of cytochalasins in the chosen aqueous medium). The physiologically desired working concentrations vary for different applications. Examples: 10 μ M Cytochalasin B can completely block adenosine-induced apoptotic body formation in cultured HL-60 cells.¹³ According to Theodoropoulos⁵, 30 μ M Cytochalasin B can shorten actin filaments by blocking monomer addition at the fast growing end of the polymer.⁵

Storage/Stability

Cytochalasin B is a solid believed to be photostable in the solid form and reasonably stable in solution. Solutions of Cytochalasin B in dimethyl sulfoxide have shown no decrease in potency when stored at 4°C for more than three years.²⁹

Cytochalasin A, C, D and E should be stored in the dark since the conjugated double bond undergoes slow isomerization from *trans* to *cis* in the presence of light.

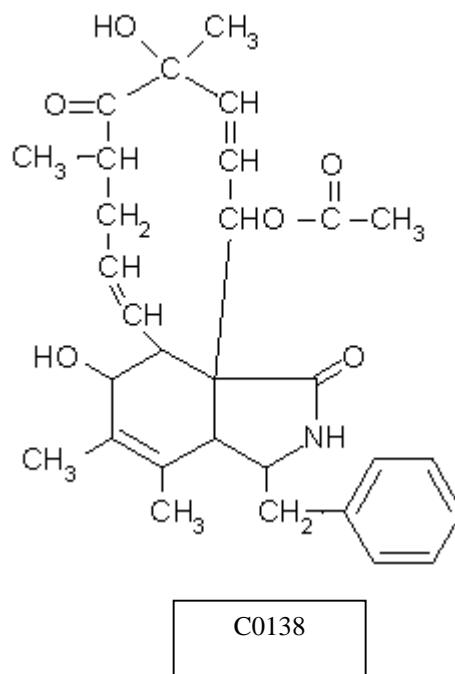
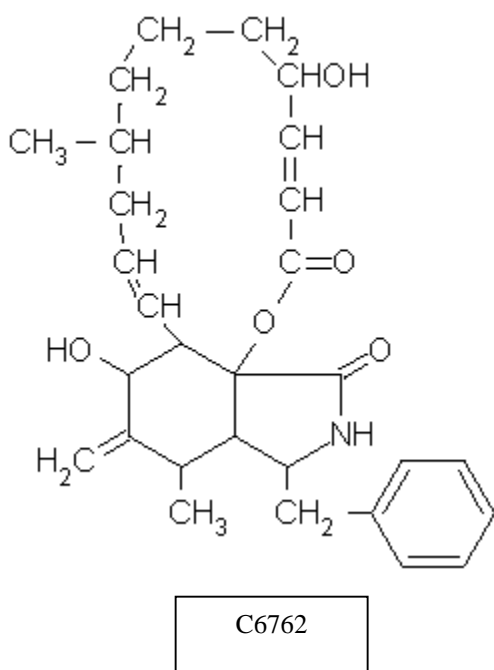
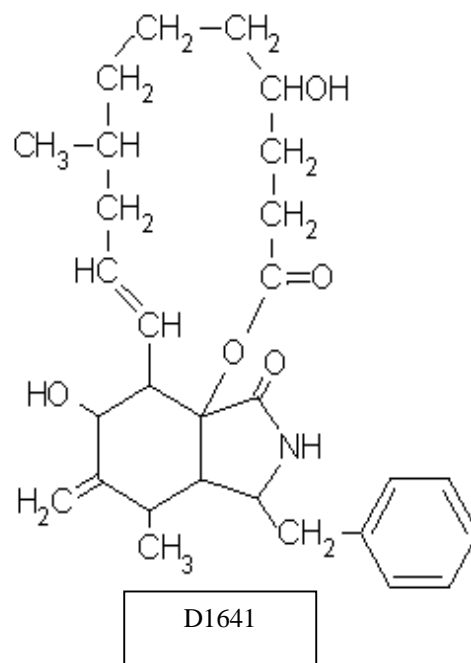
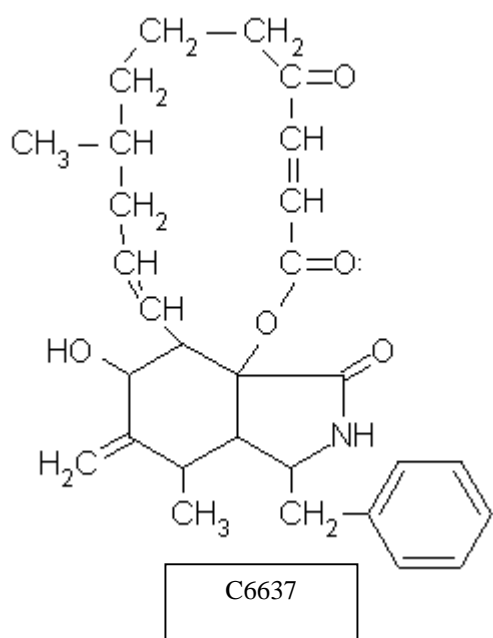
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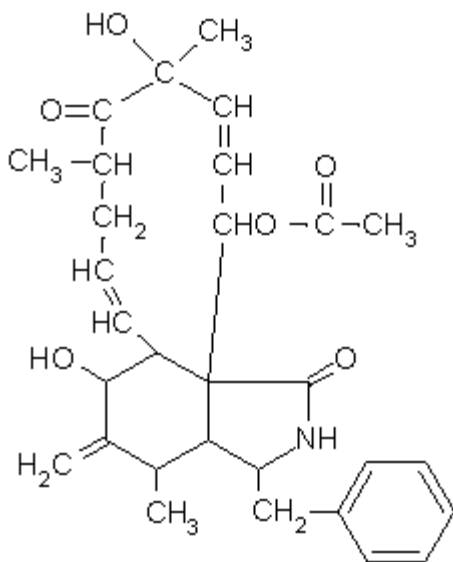
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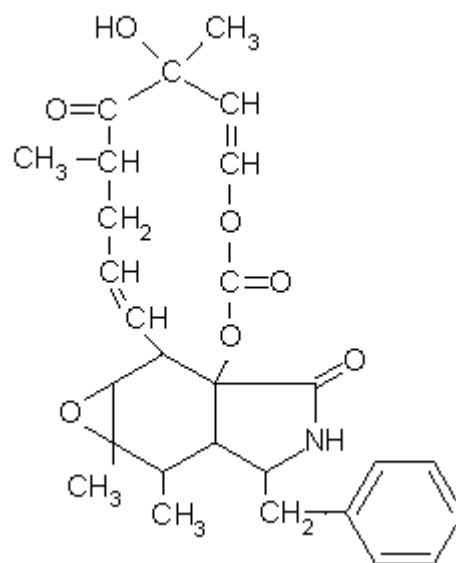
Table 1

Product Number	CAS #	Appearance	Molecular Formula	Molecular Weight in Daltons	Melting Point	Specific Rotation
C6637	14110-64-6	White powder	$C_{29}H_{37}NO_5$	477.61	193-195°C	
C0138	22144-76-9	White powder	$C_{30}H_{37}NO_6$	507.63	260°C	
C6762	14930-96-2	White powder	$C_{29}H_{37}NO_5$	479.62	218-221°C	+86.7 (0.39% solution w/v in MeOH @ 21°C)
D1641	39156-67-7	White powder	$C_{29}H_{37}NO_5$	481.64	198-203°C	
C1139	56144-22-0	Faint yellow powder	$C_{28}H_{37}NO_4$	451.61	137-139°C	+42.2 (0.97 g/100 ml CH ₃ OH)
D6016	14110-71-5	White powder	$C_{29}H_{37}NO_5$	481.64	192-193°C	
C2149	36011-19-5	White powder	$C_{28}H_{33}NO_7$	495.58	206°C	-25.6 (1g/100 ml MeOH @ 25°C)
C8273	22144-76-9	White powder or white powder with yellow cast	$C_{30}H_{37}NO_6$	507.63	268-271°C	-7.5 (55% solution w/v in dioxane @ 25°C)
C0889	53760-19-3	White powder	$C_{30}H_{39}NO_6$	493.63	268-271°C	

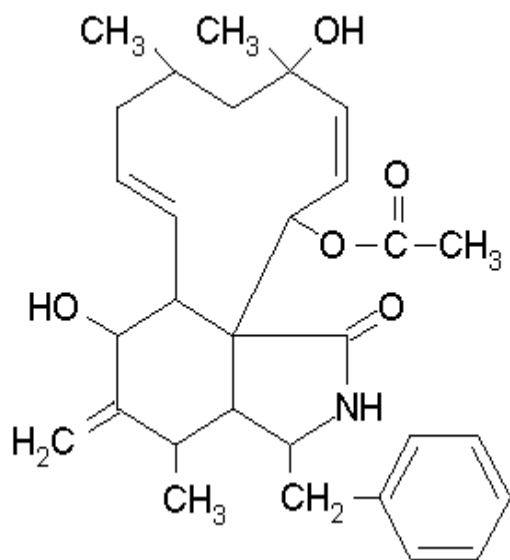




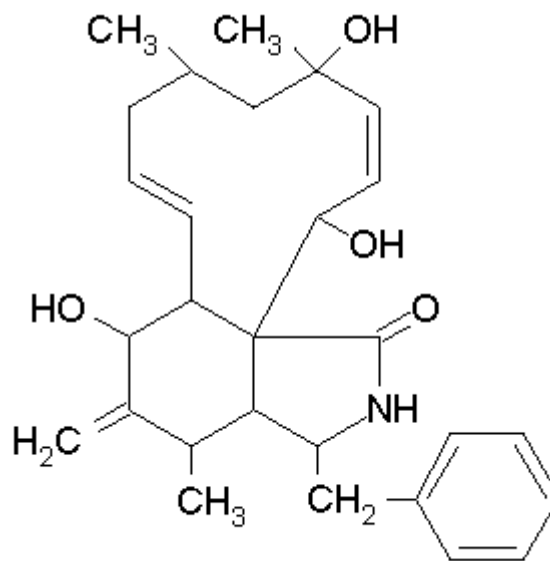
C8273



C2149



C0889



C1139

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