ProductInformation

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; *chalasis*, 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 Dihydrochalasin B. Like Dihydrochalasin 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 antibiotic[22] and antitumor[23] 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 μM Cytochalasin B can completely block adenosine-induced apoptotic body formation in cultured HL-60 cells.[13] According to Theodoropoulos[5], 30 μM 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.

References

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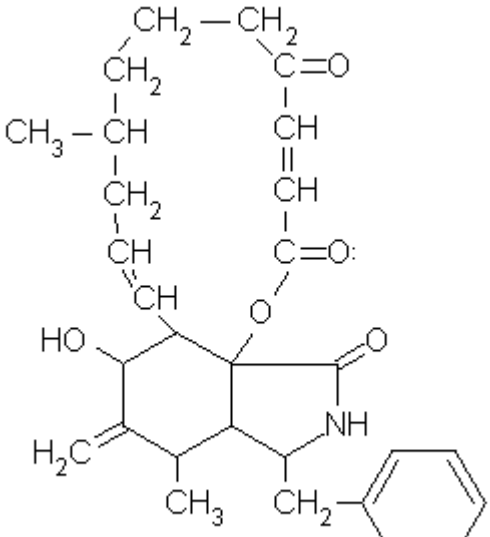
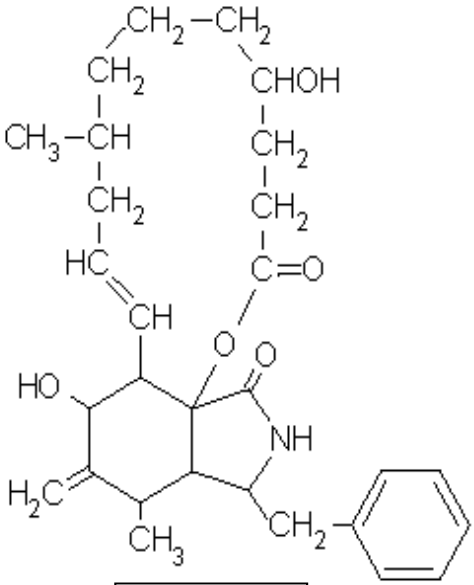
CMK 03/31/99

Table 1

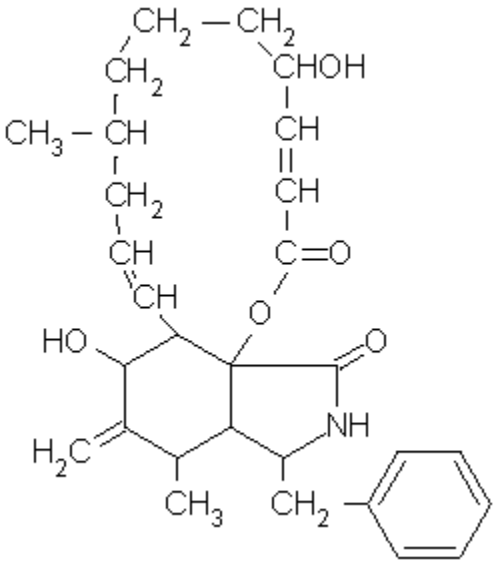
Product Number	CAS #	Appearance	Molecular Formula	Molecular Weight in Daltons	Melting Point	Specific Rotation
C6637	14110-64-6	White powder	$C_{29}H_{37}NO_5$	477.61	193-195°C	
C0138	22144-76-9	White powder	$C_{30}H_{37}NO_6$	507.63	260°C	
C6762	14930-96-2	White powder	$C_{29}H_{37}NO_5$	479.62	218-221°C	+86.7 (039% 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_3OH)
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	



C6637



D1641



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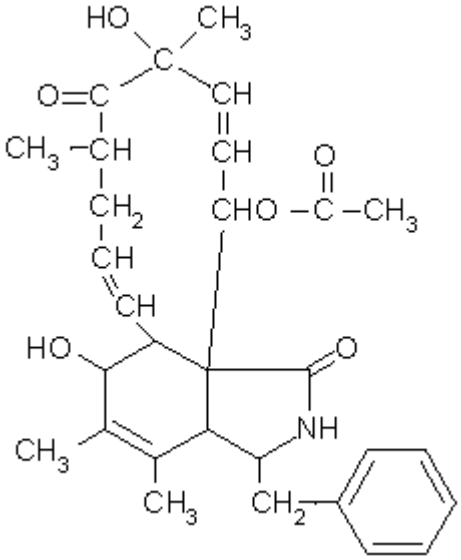
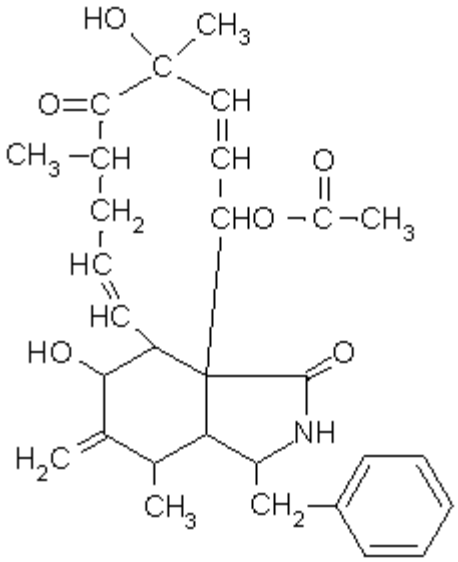
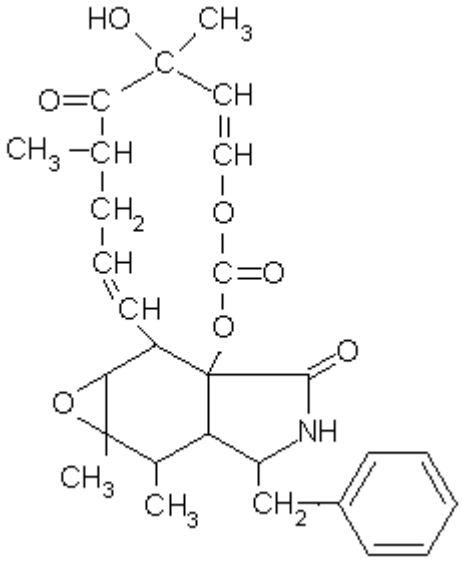


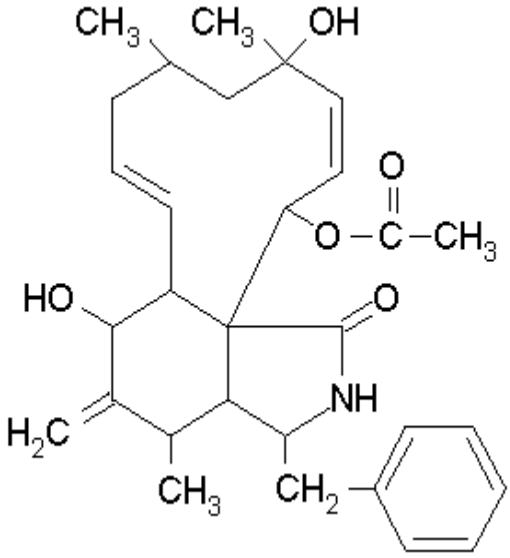
C0138



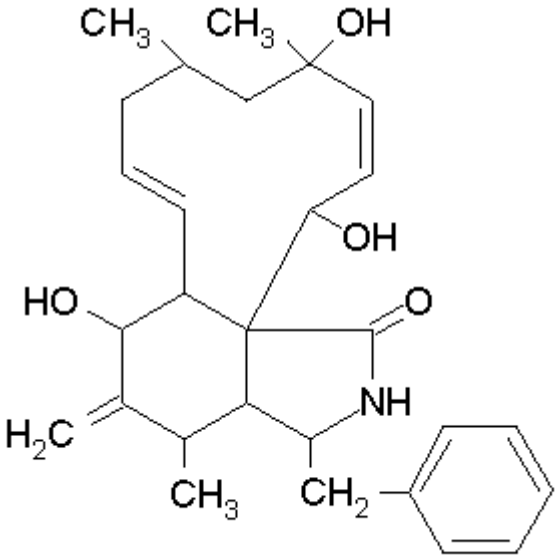
C8273



C2149



C0889



C1139