

## Product Data Sheet

Product Name: Cytochalasin D

Cat. No.: GC13440

### Chemical Properties

Cas. No. 22144-77-0

Chemical Name (3S,3aR,4R,6R,6aS,7E,10R,12S,13Z,15R,15aS)-3-benzyl-6,12-dihydroxy-4,10,12-trimethyl-5-methylene-1,11-dioxo-2,3,3a,4,5,6,6a,9,10,11,12,15-dodecahydro-1H-cycloundec[a[d]isoindol-15-yl acetate

SMILES O[C@@H]1[C@@H](/C=C/C[C@@H](C)C2=O)[C@]3([C@@H](C=C[C@]2(C)O)OC(C)=O)[C@@H]([C@@H](C)C1=C)[C@H](CC4=CC=CC=C4)NC3=O

Formula C<sub>30</sub>H<sub>37</sub>NO<sub>6</sub>

M.Wt 507.63

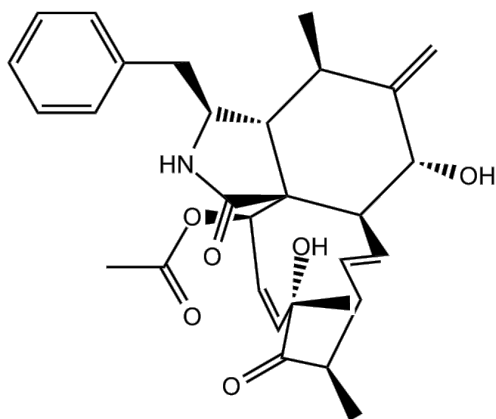
Solubility 10mg/mL in dichloromethane, 100 mg/ml in DMSO

Storage Store at -20°C, protect from light

General tips For obtaining a higher solubility, please warm the tube at 37 °C and shake it in the ultrasonic bath for a while. Stock solution can be stored below -20°C for several months.

Shipping Condition Evaluation sample solution: ship with blue ice All other available size: ship with RT, or blue ice upon request.

Structure



### Protocol

Cell experiment [1-3]:

**Caution: Product has not been fully validated for medical applications. For research use only.**

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|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cell lines         | HeLa, Vero, L, HEp2, and MDBK cells, SC-1 cells, Murine CT26 colorectal carcinoma cells                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Preparation method | The solubility of this compound in DMSO is > 10 mM. General tips for obtaining a higher concentration: Please warm the tube at 37 °C for 10 minutes and/or shake it in the ultrasonic bath for a while. Stock solution can be stored below -20°C for several months.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Reacting condition | 0.2–0.5 µg/ml                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Applications       | In HeLa, Vero, L, HEp2, and MDBK cells, cytochalasin D (0.2–0.5 µg/ml) induced sustained contraction (contracture), loss of microvilli, expression of endoplasmic contents (zeiosis), nuclear protrusion, and extension of cytoplasmic processes. Cells in G1 were most sensitive to CD; responsiveness decreased progressively during early S and is least in mid S through G2. CD inhibited transport of [14C]deoxyglucose in HeLa. In SC-1 cells, Cytochalasin D treatment severely disrupted network organization, increased the number of actin filament ends, and led to the formation of filamentous aggregates or foci composed mainly of actin filaments. Cytochalasin D (0.24~15 µg/mL, 16 h) inhibited CT26 tumor cell proliferation in time and dose dependent manner and induced significant CT26 cell apoptosis. |

### Animal experiment [3,4]:

|               |                                                           |
|---------------|-----------------------------------------------------------|
| Animal models | Murine CT26 tumor model, porcine coronary model           |
| Dosage form   | Intravenous injection, 50 mg/kg, every 3 days for 21 days |

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**Application** Cytochalasin D (i.v., 50 mg/kg) in vivo treatment significantly inhibited tumor growth and prolonged the survival times in CT26 tumor-bearing mice. In porcine coronary model, Cytochalasin D (2 µg) resulted in less late lumen loss in low-dose. High-dose Cytochalasin D (20 µg) inhibited both late lumen loss and intimal area.

**Other notes** Please test the solubility of all compounds indoor, and the actual solubility may slightly differ with the theoretical value. This is caused by an experimental system error and it is normal.

### References:

[1]. Miranda A F, Godman G C, Deitch A D, et al. Action of cytochalasin D on cells of established lines[J]. The Journal of cell biology, 1974, 61(2): 481-500.

[2]. Schliwa M. Action of cytochalasin D on cytoskeletal networks[J]. The Journal of cell biology, 1982, 92(1): 79-91.

[3]. Huang F Y, Li Y N, Mei W L, et al. Cytochalasin D, a tropical fungal metabolite, inhibits CT26 tumor growth and angiogenesis[J]. Asian Pacific journal of tropical medicine, 2012, 5(3): 169-174.

[4]. Salu K J, Bosmans J M, Huang Y, et al. Effects of cytochalasin D-eluting stents on intimal hyperplasia in a porcine coronary artery model[J]. Cardiovascular research, 2006, 69(2): 536-544.

### Background

The cytochalasins are cell-permeable fungal metabolites that inhibit actin polymerization.[1],[2],[3],[4] This interferes with such diverse processes as cell movement, growth, phagocytosis, degranulation, and secretion.[5],[6],[7],[8] Cytochalasin D is a cell-permeable inhibitor that binds actin filaments, but not actin monomers, to inhibit polymerization at concentrations as low as 0.2 µM. In this way, it prevents the migration of tumor cells.[9]

### Reference:

[1]. Brenner, S.L., and Korn, E.D. The effects of cytochalasins on actin polymerization and actin

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ATPase provide insights into the mechanism of polymerization. The Journal of Biological Chemistry 255(3), 841-844 (1980).

[2]. Lin, D.C., Tobin, K.D., Grumet, M., et al. Cytochalasins inhibit nuclei-induced actin polymerization by blocking filament elongation. Journal of Cell Biology 84, 455-460 (1980).

[3]. Ostlund, R.E., Jr., Leung, J.T., and Hajek, S.V. Regulation of microtubule assembly in cultured fibroblasts. Journal of Cell Biology 85, 386-391 (1980).

[4]. Pinder, J.C., and Gratzer, W.B. Structural and dynamic states of actin in the erythrocyte. Journal of Cell Biology 96(3), 768-775 (1983).

[5]. Flaumenhaft, R., Dilks, J.R., Rozenvayn, N., et al. The actin cytoskeleton differentially regulates platelet  $\alpha$ -granule and dense-granule secretion. Blood 105(10), 3879-3887 (2005).

[6]. Taheri-Talesh, N., Horio, T., Araujo-Bazán, L., et al. The tip growth apparatus of *Aspergillus nidulans*. Molecular Biology of the Cell 19, 1439-1449 (2008).

[7]. dos Santos, T., Varela, J., Lynch, I., et al. Effects of transport inhibitors on the cellular uptake of carboxylated polystyrene nanoparticles in different cell lines. PLoS One 6(9), 1-10 (2011).

[8]. Nightingale, T.D., White, I.J., Doyle, E.L., et al. Actomyosin II contractility expels von Willebrand factor from Weibel-Palade bodies during exocytosis. Journal of Cell Biology 194(4), 613-629 (2011).

[9]. Hayot, C., Debeir, O., Van Ham, P., et al. Characterization of the activities of actin-affecting drugs on tumor cell migration. Toxicology and Applied Pharmacology 211, 30-40 (2006).

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