Cytochalasin B

Cat. No.: HY-16928

CAS No.: 14930-96-2

Molecular Formula: $C_{29}H_{37}NO_5$

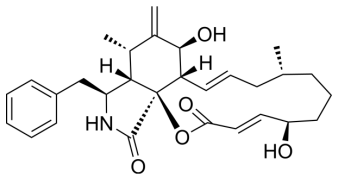
Molecular Weight: 479.61

Target: Arp2/3 Complex

Pathway: Cytoskeleton

Storage:

Powder	-20°C	3 years
In solvent	-80°C	6 months
	-20°C	1 month



SOLVENT & SOLUBILITY

In Vitro

DMSO : 83.33 mg/mL (173.75 mM; ultrasonic and warming and heat to 60°C)

Ethanol : 25 mg/mL (52.13 mM; Need ultrasonic)

Preparing Stock Solutions	Mass / Solvent / Concentration	1 mg	5 mg	10 mg
	1 mM	2.0850 mL	10.4251 mL	20.8503 mL
	5 mM	0.4170 mL	2.0850 mL	4.1701 mL
	10 mM	0.2085 mL	1.0425 mL	2.0850 mL

Please refer to the solubility information to select the appropriate solvent.

In Vivo

1. Add each solvent one by one: 0.5% CMC-Na/0.5% Tween-80 in Saline water
   Solubility: 5 mg/mL (10.43 mM); Suspened solution; Need ultrasonic
2. Add each solvent one by one: 10% EtOH >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 2.5 mg/mL (5.21 mM); Clear solution
3. Add each solvent one by one: 10% EtOH >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.5 mg/mL (5.21 mM); Clear solution
4. Add each solvent one by one: 10% EtOH >> 90% corn oil
   Solubility: ≥ 2.5 mg/mL (5.21 mM); Clear solution
5. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 2.08 mg/mL (4.34 mM); Clear solution
6. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.08 mg/mL (4.34 mM); Clear solution
7. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.08 mg/mL (4.34 mM); Clear solution

BIOLOGICAL ACTIVITY

Description	Cytochalasin B is a cell-permeable mycotoxin binding to the barbed end of actin filaments, disrupting the formation of actin polymers, with K_d value of 1.4-2.2 nM for F-actin. Cytochalasin B blocks cell migration.
IC_{50} & Target	Kd: 2.2 nM (F-actin, with Mg^{2+}), 1.4 nM (F-actin, with Mg^{2+}/K^{+})[1]
In Vitro	Cytochalasin B is a cell-permeable mycotoxin binding to the barbed end of actin filaments, inhibits the enlongation and shortening of actin filaments, with K_ds of 2.2 nM and 1.4 nM for F-actin in the presence of $MgCl_2$ (2 mM) or $MgCl_2$ (2 mM) plus KCl, respectively[1]. Cytochalasin B (0.1-10 μM) shows inhibitory effect on multiple murine cancer cell lines, with IC_{50}s of 2.56 μM (M109c), 10.46 μM (B16BL6), 105.5 μM (P388/ADR), 51.9 μM (P388/S) and IC_{80}s of 12.23 μM (M109c), 44.86 μM (B16BL6), 188.4 μM (P388/ADR), 84.1 μM (P388/S) after treatment for 3 h, with IC_{50}s of 0.25 μM (M109c), 0.37 μM (B16F10), 0.87 μM (B16BL6), and IC_{80}s of 0.75 μM (M109c), 1.21 μM (B16F10), 10.41 μM (B16BL6) after treatment for 4 days[2]. Cytochalasin B (6 μM) increases the myofibrillar fragmentation index (MFI), which is attributed to the intensely breaking of myofibrillar proteins into short segments. Cytochalasin B also accelerates the disruption of actin filaments. In addition, Cytochalasin B accelerates the transformation from F-actin to G-actin, lowering the content of F-actin and significantly increasing G-actin bands during postmortem conditioning[3]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
In Vivo	Cytochalasin B (10, 25, 50 mg/kg, i.p.) dose-dependently increases the life expectancy of Balb/c mice bearing with P388/ADR leukemias. Cytochalasin B at 50 mg/kg produces 10 % long-term survival in the multidrug resistant P388/ADR cohort, and 40 % long-term survival in the drug sensitive P388/S cohort[2]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

PROTOCOL

Cell Assay [2]	The attached cell lines M109c, B16BL6, and B16F10 are seeded at 1 to 4 × 10^4 cells/mL in 2 mL volumes in 24-well culture plates 1 day prior to treatment with Cytochalasin B. The suspension culture of P388/ADR cells is seeded at 5 × 10^4 cells/mL and allowed to grow overnight before Cytochalasin B treatment. Cells are treated with Cytochalasin B for 3 h, as well as 2, 3, or 4 days. In the case of continuous exposure for 2, 3, or 4 days, attached cells are trypsinized and counted with a hemacytometer. Leukemia cell suspensions are counted with a Coulter Counter. In the case of short-term exposure, cells are washed twice with fresh medium, then trypsinized (except for P388/ADR cells), reseeded, and allowed to regrow for 3 days, at which time they are counted. Growth results are calculated as the number of cells generated above the seeding density compared to the untreated control cells and graphically presented as percent of control increase[2]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
Animal Administration [2]	Mice[2] For chemotherapy testing, Balb/c mice under isoflurane anesthesia are challenged with 2 × 10^5 trypan blue negative P388/S or P388/ADR cells subcutaneously (s.c.) in a volume of 200 μL. Untreated mice are kept in order to determine the lethality of the challenge without chemotherapeutic intervention. Long-term survival is defined as challenged mice that survive the duration of the observation period. Cytochalasins B and D are prepared in suspension form in 2 % carboxymethyl cellulose 1 % tween 20 (CMC/Tw) for intraperitoneal (i.p.) administration. The congeners or the vehicle are administered to leukemia-challenged mice on Days 1-8 following the initial challenge[2]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

CUSTOMER VALIDATION

- Signal Transduct Target Ther. 2023 Dec 25;8(1):457.
- Nat Commun. 2024 Jan 5;15(1):296.
- Nat Commun. 2019 Sep 4;10(1):3981.

- Adv Sci (Weinh). 2020 Jun 17;7(15):1903583.
- Environ Sci Technol Lett. 2023 Sep 27.

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REFERENCES

[1]. Liang Ma, et al. Discovery of the migrasome, an organelle mediating release of cytoplasmic contents during cell migration. Cell Res. 2015 Jan;25(1):24-38.

[2]. Theodoropoulos PA, et al. Cytochalasin B may shorten actin filaments by a mechanism independent of barbed end capping. Biochem Pharmacol. 1994 May 18;47(10):1875-81.

[3]. Trendowski M, et al. Chemotherapy with cytochalasin congeners in vitro and in vivo against murine models. Invest New Drugs. 2015 Apr;33(2):290-9.

[4]. Zhou C, et al. The effect of Cytochalasin B and Jasplakinolide on depolymerization of actin filaments in goose muscles during postmortem conditioning. Food Res Int. 2016 Dec;90:1-7.

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