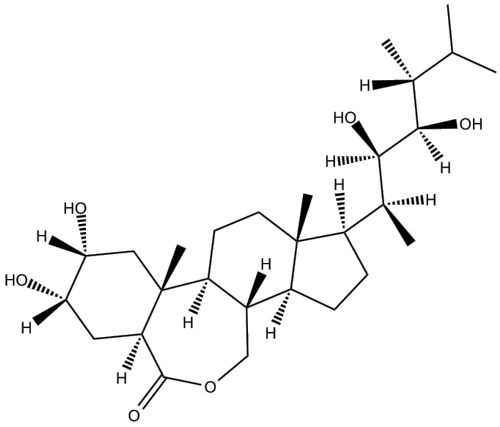
Product Data Sheet

Product Name: Epibrassinolide
Cat. No.: GC11834

Chemical Properties

Cas. No.	78821-43-9		
Chemical Name	(3aS,5S,6R,7aR,7bS,9aS,10R,12aS,12bS)-10-((2S,3R,4R,5R)-3,4-dihydroxy-5,6-dimethylheptan-2-yl)-5,6-dihydroxy-7a,9a-dimethyltetradecahydro-1H-benzo[c]indeno[5,4-e]oxepin-3(12bH)-one		
SMILES	CC([C@@]([C@](O)([H])[C@@](O)([H])[C@@]([C@@]1([H])CC[C@@]2([H])[C@]([C@]3([H])CC[C@]12C)([H])COC([C@@]4([H])C[C@@](O)([H])[C@@](O)([H])C[C@]34C)=O)([H])C)([H])C)C		
Formula	$C_{28}H_{48}O_6$	M.Wt	480.68
Solubility	DMF: 5 mg/mL,DMF:PBS (pH 7.2) (1:3): 0.25 mg/mL,DMSO: 3 mg/mL,Ethanol: 3 mg/mL	Storage	Store at -20°C
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

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Cell experiment [1]:

Cell lines	SW480 and DLD-1 colon cancer cells
Preparation Method	Human colon cancer cell lines SW480 (CCL228) and DLD-1 (CCL221) were used in this experiment. The DLD-1 cells were grown in McCoy's 5A medium, and the SW480 cells were grown in MEM medium. All the media were supplemented with 10% fetal bovine serum, 1000U/ml penicillin, and 10μg/mL streptomycin. The cells were cultured at 37°C in humidified 5% CO_2 incubator. Each colon cancer cell line was seeded at a density of 1×10^5cells/well in 6-well plates and treated with 25μM Epibrassinolide for 48h. The polyamine content of each sample was determined by high-pressure liquid chromatography. Autophagy induction was determinated by acridine orange staining. Proteins were extracted for Immunoblotting analysis.
Reaction Conditions	25μM; 48h
Applications	Treatment of SW480 and DLD-1 colon cancer cells with Epibrassinolide induced autophagy, depleted intracellular polyamines, activated Akt/mTOR signaling, and significantly increased LC3 lipidation and SSAT/PAO expression.

Animal experiment [2]:

Animal models	SCID mice

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Preparation Method	A total of 18 female, two weeks age, severe combined immunodeficiency (SCID) mice were used in the experiments. Experimental groups were as follows: Healthy mice receiving Epibrassinolide, tumor bearing control group, tumor bearing vehicle treated group, tumor bearing 240μg/kg/day Epibrassinolide treated group, tumor bearing 480μg/kg/day Epibrassinolide treated group, tumor bearing 720μg/kg/day Epibrassinolide treated group. 7×10^6 SW480 colon cancer cells were inoculated with 200μl of matrigel into the right limb cavities of mice. Epibrassinolide was intraperitoneally injected consecutively for 40 days. After incubation period, SW480 tumor sizes became visible in mice. Tumor sizes of the mice divided into groups were measured with the help of an electronic caliper every two days. The mice were weighed at daily intervals of 5 days before the daily Epibrassinolide injections on the precision balance and their weights were noted. Before the mice were sacrificed, they were anesthetized with isofluorane and 500μl of blood was collected from the jugular vein of the mice, and serum was preserved for further ELISA experiments. The mice were then sacrificed, their tumors were removed and their pictures were taken.
Dosage form	0–720μg/kg/day; 40 days; i.p.
Applications	Epibrassinolide reduced tumor volume and diameter, and decreased the CEA level in the serum in SW480-derived xenografts in SCID mice.

References:

[1] Adacan K, Obakan Yerlİkaya P. Epibrassinolide activates AKT to trigger autophagy with polyamine metabolism in SW480 and DLD-1 colon cancer cell lines. *Turk J Biol*. 2020;44(6):417-426.

[2] Obakan Yerlikaya P, Adacan K, Karatug Kacar A, Coker Gurkan A, Arisan ED. Epibrassinolide impaired colon tumor progression and induced autophagy in SCID mouse xenograft model via acting on cell cycle progression without affecting endoplasmic reticulum stress observed in vitro. *Int J Biochem Cell Biol*. 2023;155:106360.

Background

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Background

Epibrassinolide is a ubiquitously occurring brassinosteroid plant growth hormone[1]. Epibrassinolide is widely used as a plant growth regulator to alleviate heavy-metal and pesticide stress[2]. Epibrassinolide is also used as a potential apoptotic inducer in various cancer cells[3].

In vitro, treatment of LNCaP and DU145 prostate cancer cells with Epibrassinolide (25μM; 24h) induced mitochondria-mediated apoptosis, significantly decreased cell viability, increased sub-G1 DNA fragmentation, activated caspase cascades, and depleted intracellular polyamine levels[4]. Treatment of SW480 and DLD-1 colon cancer cells with Epibrassinolide (25μM; 48h) induced autophagy, depleted intracellular polyamines, activated Akt/mTOR signaling, and significantly increased LC3 lipidation and SSAT/PAO expression[5].

In vivo, Epibrassinolide (0–720μg/kg/day; 40 days; i.p.) reduced tumor volume and diameter, and decreased the CEA level in the serum in SW480-derived xenografts in SCID mice[6]. Epibrassinolide (1μM; 24h; aqueous exposure at 5mL/well) reversed ethanol-induced behavioral deficits and restored GSH/GSSG redox balance in zebrafish embryos[7].

References:
[1] Shahzad B, Tanveer M, Che Z, et al. Role of 24-epibrassinolide (EBL) in mediating heavy metal and pesticide induced oxidative stress in plants: A review. *Ecotoxicol Environ Saf*. 2018;147:935-944.
[2] Parrey ZA, Shah SH, Mohammad F, Siddiqui MH, Alamri S, Kalaji HM. Exogenous epibrassinolide application improves essential oil biosynthesis and trichome development in peppermint via modulating growth and physicochemical processes. *Sci Rep*. 2023;13(1):12924.
[3] Sadava D, Chen S. Molecular Interactions of the Plant Steroid Hormone Epibrassinolide on Human Drug-Sensitive and Drug-Resistant Small-Cell Lung Carcinoma Cells. *Cancers (Basel)*. 2024;16(22):3812.
[4] Obakan P, Arisan ED, Calcabrini A, Agostinelli E, Bolkent S, Palavan-Unsal N. Activation of polyamine catabolic enzymes involved in diverse responses against epibrassinolide-induced apoptosis in LNCaP and DU145 prostate cancer cell lines. *Amino Acids*. 2014;46(3):553-564.
[5] Adacan K, Obakan Yerlİkaya P. Epibrassinolide activates AKT to trigger autophagy with polyamine metabolism in SW480 and DLD-1 colon cancer cell lines. *Turk J Biol*. 2020;44(6):417-426.
[6] Obakan Yerlikaya P, Adacan K, Karatug Kacar A, Coker Gurkan A, Arisan ED. Epibrassinolide impaired colon tumor progression and induced autophagy in SCID mouse xenograft model via acting

on cell cycle progression without affecting endoplasmic reticulum stress observed in vitro. *Int J Biochem Cell Biol*. 2023;155:106360.
[7] Fernandes P, Monteiro SM, Venâncio C, Félix L. 24-Epibrassinolide protects against ethanol-induced behavioural teratogenesis in zebrafish embryo. *Chem Biol Interact*. 2020;328:109193.