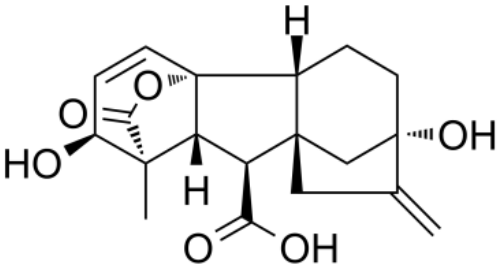
Product Data Sheet

Product Name: Gibberellic acid
Cat. No.: GC38309

Chemical Properties

Cas. No.	77-06-5		
SMILES	OC([C@H]1[C@@]([C@]23C)([H])[C@@](OC2=O)(C=C[C@@H]3O)[C@@](CC4)([H])[C@]1(C5)C[C@]4(O)C5=C)=O		
Formula	$C_{19}H_{22}O_6$	M.Wt	346.37
Solubility	DMSO: 250 mg/mL (721.77 mM)	Storage	Store at 2-8°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

Plant experiment [1]:

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Plant lines	OxABF1–6 and OxABF1–9 (OsABF1 overexpression lines)
Preparation Method	First, seeds were soaked in a 2% sodium hypochlorite (NaClO, v/v) solution for disinfection. After 20min, the seeds were rinsed with deionized water and then germinated in darkness at 30°C. Subsequently, the seedlings were transferred to 1/2 Kimura B nutrient solution for another 6 days. Finally, uniform seedlings were selected and transferred into the following solutions: complete nutrient solution without cadmium (-Cd), -Cd solution supplemented with 0.05μM Gibberellic acid (GA) (-Cd+Gibberellic acid), solution containing 1μM cadmium (+Cd), +Cd solution with 0.05μM Gibberellic acid (+Cd+Gibberellic acid), +Cd solution with 10μM nitric oxide scavenger cPTIO (+Cd+cPTIO), and +Cd+Gibberellic acid solution with 10μM cPTIO (+Cd+Gibberellic acid+cPTIO). The Gibberellic acid-deficient lines and their wild-type (WT, Nip) seedlings were subjected to -Cd and +Cd solutions for 5 days, after which the seedlings were harvested for analysis. The treatment solutions were changed every two days.
Reaction Conditions	0.05μM
Applications	Gibberellic acid alleviates cadmium toxicity in rice by regulating NO accumulation and cell wall fixation capacity of cadmium.

Animal experiment [2]:

Animal models	male C57BL/6J mice

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Preparation Method	Mice were randomly divided into four groups (6-8 mice per group) and were administered lipopolysaccharide (LPS) via intraperitoneal injection or Gibberellic acid (GA_3, dissolved in a 1% ethanol solution) via gavage, along with different reagents as follows: control group, saline (8μl/g); Gibberellic acid group, Gibberellic acid (5mg/kg); LPS group, LPS (10mg/kg); LPS + Gibberellic acid group, Gibberellic acid (5mg/kg) + LPS (10mg/kg) dissolved in saline, with LPS injected 60min after Gibberellic acid administration. Mouse survival was monitored for 10 days (n = 20). In a parallel experiment, mice received the same treatments, and their blood and brains were collected at various time points after injection of LPS or saline. Serum and brain tissue samples were stored at –80°C or fixed with formalin for future use. Mice were euthanized by cervical dislocation after intraperitoneal injection of an overdose of 2% pentobarbital sodium (50mg/kg).
Dosage form	5mg/kg; 10 days; i.g.
Applications	Gibberellic acid significantly reduced the expression of multiple inflammatory factors in the hippocampus of sepsis mice.

References:

[1] Liu YS, Tao Y, Yang XZ, et al. Gibberellic acid alleviates cadmium toxicity in rice by regulating NO accumulation and cell wall fixation capacity of cadmium. J Hazard Mater. 2022 Oct 5;439:129597.
[2] Xu HJ, Lin YY, Yu JJ, et al. Gibberellic acid targeting ZBTB16 reduces NF-?B dependent inflammatory stress in sepsis-induced neuroinflammation. Eur J Pharmacol. 2024 Aug 5;976:176665.

Background

Gibberellic acid is a plant hormone belonging to the gibberellins, which are widely present in plants and can promote plant growth and development[1]. Gibberellic acid can also induce liver and kidney dysfunction in rats and generate oxidative stress.

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The application of different levels of nitrogen alone and in combination with Gibberellic acid (60g/ha) and the urease inhibitor (NBPT) significantly increased the yield of corn[2]. Gibberellic acid (0.05μM) alleviates cadmium toxicity in rice by regulating NO accumulation and cell wall fixation capacity of cadmium[3]. Gibberellic acid (0 and 0.05μM; 14 days) mitigates nickel stress in soybean by cell wall fixation and regulating oxidative stress metabolism and glyoxalase system[4]. Gibberellic acid (100mg/L; 14 days)-induced generation of hydrogen sulfide alleviates boron toxicity in tomato (Solanum lycopersicum L.) plants[5]. Pre-treatment with Gibberellic acid (600μM; 1h) improved the viability of LPS-stimulated BV2 microglial cells[6].

In animal experiments, Gibberellic acid (5mg/kg; 10 days; i.g.) significantly reduced the expression of multiple inflammatory factors in the hippocampus of sepsis mice[6]. Gibberellic acid (55mg/kg; i.g.) induces dysfunction of liver and kidney and oxidative stress in male albino rats[7].

References:
[1] Huang YP, Chen IH, Kao YS, et al. The gibberellic acid derived from the plastidial MEP pathway is involved in the accumulation of Bamboo mosaic virus. New Phytol. 2022 Aug;235(4):1543-1557.
[2] Ullah I, Dawar K, Tariq M, et al. Gibberellic acid and urease inhibitor optimize nitrogen uptake and yield of maize at varying nitrogen levels under changing climate. Environ Sci Pollut Res Int. 2022 Jan;29(5):6568-6577.
[3] Liu YS, Tao Y, Yang XZ, et al. Gibberellic acid alleviates cadmium toxicity in rice by regulating NO accumulation and cell wall fixation capacity of cadmium. J Hazard Mater. 2022 Oct 5;439:129597.
[4] Bhat JA, Basit F, Alyemeni MN, et al. Gibberellic acid mitigates nickel stress in soybean by cell wall fixation and regulating oxidative stress metabolism and glyoxalase system. Plant Physiol Biochem. 2023 May;198:107678.
[5] Kaya C, Sarıoğlu A, Ashraf M, et al. Gibberellic acid-induced generation of hydrogen sulfide alleviates boron toxicity in tomato (Solanum lycopersicum L.) plants. Plant Physiol Biochem. 2020 Aug;153:53-63.
[6] Xu HJ, Lin YY, Yu JJ, et al. Gibberellic acid targeting ZBTB16 reduces NF-κB dependent inflammatory stress in sepsis-induced neuroinflammation. Eur J Pharmacol. 2024 Aug 5;976:176665.
[7] Soliman MM, Gaber A, Alsanie WF, et al. Gibberellic acid-induced hepatorenal dysfunction and oxidative stress: Mitigation by quercetin through modulation of antioxidant, anti-inflammatory, and antiapoptotic activities. J Food Biochem. 2022 Feb;46(2):e14069.

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