

Product Data Sheet

Product Name: DIMBOA

Cat. No.: GC60138

Chemical Properties

Cas. No. 15893-52-4

SMILES O=C1C(O)OC2=CC(OC)=CC=C2N1O

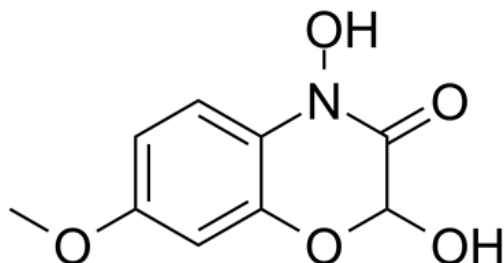
Formula C9H9NO5 M.Wt 211.17

Solubility DMSO: 125 mg/mL (591.94 mM) 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

Cell experiment [1]:

Cell lines Pseudomonas putida KT2440

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

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P. putida KT2440 cells were grown to mid-exponential phase in 100 mL M9 Preparation Method medium before DIMBOA was added to a final concentration of 5 µg mL⁻¹. After 1 hour of exposure, cells were harvested by centrifugation at 4°C.

Reaction Conditions 5 µg mL⁻¹, 1 h

Applications *P. putida* KT2440 appears relatively tolerant to DIMBOA in comparison to other soil bacteria. For all subsequent experiments, DIMBOA was employed at concentrations of 5 µg mL⁻¹ (0.023 mM).

References:

[1]: Neal A L, Ahmad S, Gordon-Weeks R, et al. Benzoxazinoids in root exudates of maize attract *Pseudomonas putida* to the rhizosphere[J]. PloS one, 2012, 7(4): e35498.

Background

DIMBOA (2,4-dihydroxy-7-methoxy-2H-1,4-benzoxazin-3(4H)-one) is a benzoxazinoid (BX), is a secondary metabolite in grasses [1]. DIMBOA act as antibiotic and allelochemical, part of the chemical defense system of graminaceous plants such as maize, wheat, and rye [1,2]. DIMBOA possess growth inhibitory properties against many strains of studied bacteria and fungi, such as *Staphylococcus aureus*, *Escherichia coli* as well as against *Saccharomyces cerevisiae* [2]. Once released, BXs degrade relatively quickly in aqueous environments with a half-life of less than 24 hours [1].

DIMBOA is weak bacterial mutagens and furthermore caused aneuploidy in human-derived liver cells (HepG2 cells) [3]. DIMBOA showed genotoxic effects in HepG2 cell line [4].

DIMBOA showed the antibacterial activity against *Ralstonia solanacearum* with minimum inhibitory concentrations (MICs) of 50, 100 and 200 mg/L. DIMBOA also significantly affect bacterial growth, reduce biofilm formation, and inhibit swarming motility within 24 h [5].

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- [1]. Neal A L, Ahmad S, Gordon-Weeks R, et al. Benzoxazinoids in root exudates of maize attract *Pseudomonas putida* to the rhizosphere[J]. PloS one, 2012, 7(4): e35498.
- [2]. Gleńsk M, Gajda B, Franiczek R, et al. In vitro evaluation of the antioxidant and antimicrobial activity of DIMBOA [2, 4-dihydroxy-7-methoxy-2 H-1, 4-benzoxazin-3 (4 H)-one][J]. Natural product research, 2016, 30(11): 1305-1308.
- [3]. Buchmann C A, Nersesyan A, Kopp B, et al. Dihydroxy-7-methoxy-1, 4-benzoxazin-3-one (DIMBOA) and 2, 4-dihydroxy-1, 4-benzoxazin-3-one (DIBOA), two naturally occurring benzoxazinones contained in sprouts of Gramineae are potent aneugens in human-derived liver cells (HepG2)[J]. Cancer letters, 2007, 246(1-2): 290-299.
- [4]. Buchmann C, Nersesyan A, Kopp B, et al. DIMBOA and DIBOA, two naturally occurring benzoxazinoides, cause aneuploidy in a human-derived liver cell line (HepG2)[C]//BMC Pharmacology. BioMed Central, 2007, 7(2): 1-1.
- [5]. Guo B, Zhang Y, Li S, et al. Extract from maize (*Zea mays* L.): antibacterial activity of DIMBOA and its derivatives against *Ralstonia solanacearum*[J]. Molecules, 2016, 21(10): 1397.

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