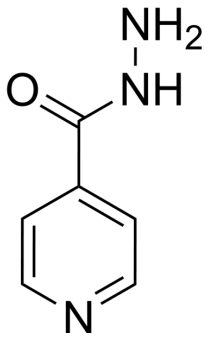
Isoniazid

Cat. No.:	HY-B0329
CAS No.:	54-85-3
Molecular Formula:	$C_6H_7N_3O$
Molecular Weight:	137.14
Target:	Bacterial; Autophagy; Mitophagy; Antibiotic
Pathway:	Anti-infection; Autophagy
Storage:	4°C, protect from light * In solvent : -80°C, 6 months; -20°C, 1 month (protect from light)



SOLVENT & SOLUBILITY

In Vitro

DMSO : 50 mg/mL (364.59 mM; Need ultrasonic)

H_2O : 33.33 mg/mL (243.04 mM; Need ultrasonic)

Preparing Stock Solutions

Solvent / Mass / Concentration	1 mg	5 mg	10 mg
1 mM	7.2918 mL	36.4591 mL	72.9182 mL
5 mM	1.4584 mL	7.2918 mL	14.5836 mL
10 mM	0.7292 mL	3.6459 mL	7.2918 mL

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

In Vivo

1. Add each solvent one by one: PBS
   Solubility: 150 mg/mL (1093.77 mM); Clear solution; Need ultrasonic

BIOLOGICAL ACTIVITY

Description

Isoniazid (INH) is a proagent and must be activated by a bacterial catalase-peroxidase enzyme KatG. Isoniazid is bactericidal to rapidly dividing mycobacteria and has anti-tuberculostatic activity[1][2][3][4].

In Vitro

Isoniazid (INH) is a prodrug and must be activated by a bacterial catalase-peroxidase enzyme that in M. tuberculosis is called KatG[1].

KatG couples the isonicotinic acyl with NADH to form isonicotinic acyl-NADH complex. This complex binds tightly to the enoyl-acyl carrier protein reductase known as InhA, thereby blocking the natural enoyl-AcpM substrate and the action of fatty acid synthase. This process inhibits the synthesis of mycolic acid, required for the mycobacterial cell wall. A range of radicals are produced by KatG activation of isoniazid, including nitric oxide, which has also been shown to be important in the action of another antimycobacterial prodrug PA-824[2][3].

Isoniazid is bactericidal to rapidly dividing mycobacteria but is bacteriostatic if the mycobacteria are slow-growing[4].

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

CUSTOMER VALIDATION

- Front Bioeng Biotechnol. 2022 Mar 17;10:826093.
- ACS Chem Biol. 2021 Dec 15.
- Biotechnol Bioeng. 2021 Sep 3.

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REFERENCES

[1]. Suarez, J., et al., An oxyferrous heme/protein-based radical intermediate is catalytically competent in the catalase reaction of Mycobacterium tuberculosis catalase-peroxidase (KatG). J Biol Chem, 2009. 284(11): p. 7017-29.

[2]. Timmins, G.S., et al., Nitric oxide generated from isoniazid activation by KatG: source of nitric oxide and activity against Mycobacterium tuberculosis. Antimicrob Agents Chemother, 2004. 48(8): p. 3006-9.

[3]. Singh, R., et al., PA-824 kills nonreplicating Mycobacterium tuberculosis by intracellular NO release. Science, 2008. 322(5906): p. 1392-5.

[4]. Ahmad, Z., et al., Biphasic kill curve of isoniazid reveals the presence of drug-tolerant, not drug-resistant, Mycobacterium tuberculosis in the guinea pig. J Infect Dis, 2009. 200(7): p. 1136-43.

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