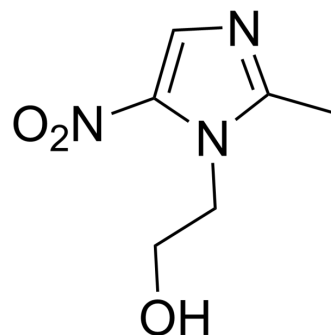


## Metronidazole

<b>Cat. No.:</b>	HY-B0318
<b>CAS No.:</b>	443-48-1
<b>Molecular Formula:</b>	C <sub>6</sub> H <sub>9</sub> N <sub>3</sub> O <sub>3</sub>
<b>Molecular Weight:</b>	171.15
<b>Target:</b>	Bacterial; Parasite; Apoptosis; Antibiotic
<b>Pathway:</b>	Anti-infection; Apoptosis
<b>Storage:</b>	4°C, protect from light * In solvent : -80°C, 1 year; -20°C, 6 months (protect from light)



### SOLVENT & SOLUBILITY

#### In Vitro

DMSO : 35 mg/mL (204.50 mM; Need ultrasonic and warming)  
H<sub>2</sub>O : 16.67 mg/mL (97.40 mM; Need ultrasonic)

Preparing Stock Solutions	Solvent Concentration	Mass		
		1 mg	5 mg	10 mg
	1 mM	5.8428 mL	29.2141 mL	58.4283 mL
	5 mM	1.1686 mL	5.8428 mL	11.6857 mL
	10 mM	0.5843 mL	2.9214 mL	5.8428 mL

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

#### In Vivo

- Add each solvent one by one: PBS  
Solubility: 12.5 mg/mL (73.04 mM); Clear solution; Need ultrasonic and warming and heat to 60°C
- Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline  
Solubility: ≥ 2.08 mg/mL (12.15 mM); Clear solution
- Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)  
Solubility: ≥ 2.08 mg/mL (12.15 mM); Clear solution
- Add each solvent one by one: 10% DMSO >> 90% corn oil  
Solubility: ≥ 2.08 mg/mL (12.15 mM); Clear solution

### BIOLOGICAL ACTIVITY

#### Description

Metronidazole is an orally active nitroimidazole antibiotic. Metronidazole can cross blood brain barrier. Metronidazole can be used for the research of anaerobic infections<sup>[1][2][3][4]</sup>.

#### In Vitro

Metronidazole displays inhibitory activity towards anaerobic protozoa *Trichomonas vaginalis*, *Entamoeba histolytica*, *Giardia lamblia*, and *Balantidium coli*<sup>[1]</sup>.  
Metronidazole (4-8 µg/mL) inhibits anaerobic bacteria and shows good bactericidal activity<sup>[1]</sup>.

Metronidazole (0.1 µg/mL-0.01 mg/mL; 12-96 h) induces granular formation and triggers apoptosis in Blastocystis sp<sup>[2]</sup>.  
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

#### Apoptosis Analysis<sup>[2]</sup>

Cell Line:	Blastocystis sp. Cells
Concentration:	0.1 µg/mL-0.01 mg/mL
Incubation Time:	12, 24, 48, 60, 72, 84, 96 hours
Result:	Decreased cell diameter, as a hallmark of an apoptotic cell, and resulted cell shrinkage.

#### In Vivo

Metronidazole (135 mg/kg/d; p.o.; 28 d) can cross the blood brain barrier, and exhibits neurotoxicity under long term administration in rats<sup>[3]</sup>.

Metronidazole (1 g/L; p.o.; 4 weeks) results skeletal muscle atrophy and changes the expression of genes involved in the muscle peripheral circadian rhythm machinery and metabolic regulation<sup>[4]</sup>.

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

Animal Model:	Sprague-Dawley (SD) rats (200-220 g) <sup>[3]</sup>
Dosage:	135 mg/kg
Administration:	Oral gavage; once daily; 28 days
Result:	Caused inflammatory markers increasing, including iNOS, eNOS, Bax and caspase 3 protein expressions increasing and caused oxidative stress damage in brain tissue, with MDA content rising.

Animal Model:	SPF C57Bl/6J mice (6-7 months old) <sup>[4]</sup>
Dosage:	1 g/L
Administration:	Oral gavage; provided with drinking water for 4 weeks, changed twice weekly
Result:	Resulted the muscle core clock and effector genes Cry2, Ror-β, E4BP4, PP ARγ and adiponectin expression increasing. Decreased hind limb muscle weight and resulted in smaller fibers in the tibialis anterior muscle.

## CUSTOMER VALIDATION

- Cell Metab. 2023 Sep 29;S1550-4131(23)00340-6.
- Microbiome. 2020 Aug 20;8(1):120.
- Emerg Microbes Infect. 2022 Feb 22;1-34.
- Water Res. 2023 May 21, 120110.
- Gut Microbes. 2023 Dec;15(2):2282790.

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## REFERENCES

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[1]. Scully BE. Metronidazole. Med Clin North Am. 1988 May;72(3):613-21.

[2]. Dhurga DB, et al. Granular Formation during Apoptosis in Blastocystis sp. Exposed to Metronidazole (MTZ). PLoS One. 2016 Jul 29;11(7):e0155390.

[3]. Chaturvedi S, et al. Mechanistic exploration of quercetin against metronidazole induced neurotoxicity in rats: Possible role of nitric oxide isoforms and inflammatory cytokines. Neurotoxicology. 2020 Jul;79:1-10.

[4]. Manickam R, et al. Metronidazole Causes Skeletal Muscle Atrophy and Modulates Muscle Chronometabolism. Int J Mol Sci. 2018 Aug 16;19(8):2418.

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

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