Nitrofurantoin

Cat. No.: HY-A0090

CAS No.: 67-20-9

Molecular Formula: $C_8H_6N_4O_5$

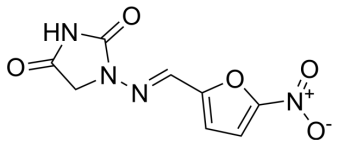
Molecular Weight: 238.16

Target: Bacterial; Antibiotic

Pathway: Anti-infection

Storage:

Powder	-20°C	3 years
	4°C	2 years
In solvent	-80°C	2 years
	-20°C	1 year



SOLVENT & SOLUBILITY

In Vitro

DMSO : 100 mg/mL (419.89 mM; Need ultrasonic)

Preparing Stock Solutions	Solvent / Mass / Concentration	1 mg	5 mg	10 mg
	1 mM	4.1989 mL	20.9943 mL	41.9886 mL
	5 mM	0.8398 mL	4.1989 mL	8.3977 mL
	10 mM	0.4199 mL	2.0994 mL	4.1989 mL

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

BIOLOGICAL ACTIVITY

Description

Nitrofurantoin is a potent and orally active broad-spectrum beta-lactamase antimicrobial agent. Nitrofurantoin acts as an antibiotic and can be used for the study of urinary tract infections (UTIs), including cystitis and kidney infections[1].

IC_{50} & Target

β-lactam

In Vitro

Nitrofurantoin (0-512 mg/L; 8 h) treatment inhibits the growth of E. coli isolates[3].

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

Cell Viability Assay[3]

Cell Line:	E. coli isolates: DA10708, DA13815, DA13824, DA13957, DA13992, DA10626, DA10627
Concentration:	0, 32, 64, 128, 256, and 512 mg/L
Incubation Time:	8 hours

Result:	Observed bactericidal effect at 32 mg/L For DA10708, DA13815 and DA13824. Inhibited the growth of DA13957 and DA13992 completely at 128 mg/L, observed bactericidal effect at 256 mg/L. Showed a moderate killing at >128 mg/L for DA10626 and DA10627.

In Vivo

Nitrofurantoin pharmacokinetic effects in SD Rats[4].

Parameters	10 mg/kg p.o.	2 mg/kg i.v.
AUC_{0-720} (μg/mL·min)	306	
AUC_{0-120} (μg/mL·min)		90.3
$AUC_{0-\infty}$ (μg/mL·min)	344	91.5
C_{max} (μg/mL)	1.01	
CL/F or CL (ml/min/kg)	31.0	22.7
$t_{1/2}$ (min)	166	23.6
Bioavailability (%)	60.1	

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CUSTOMER VALIDATION

- Nat Commun. 2022 Mar 2;13(1):1116.
- Water Res. 2023 May 21, 120110.
- Biotechnol Bioeng. 2021 Sep 3.
- Microbiol Spectr. 2022 Jan 12;e0099121.
- Research Square Preprint. 2021 Aug.

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REFERENCES

[1]. Linus Sandegren, et al. Nitrofurantoin resistance mechanism and fitness cost in Escherichia coli. J Antimicrob Chemother. 2008 Sep;62(3):495-503.

[2]. Xiaodong Wang, et al. Effects of the flavonoid chrysin on nitrofurantoin pharmacokinetics in rats: potential involvement of ABCG2. Drug Metab Dispos. 2007 Feb;35(2):268-74.

[3]. Huttner A, et al. Nitrofurantoin revisited: a systematic review and meta-analysis of controlled trials. J Antimicrob Chemother. 2015 Sep;70(9):2456-64.

[4]. Garau J. Other antimicrobials of interest in the era of extended-spectrum beta-lactamases: fosfomycin, nitrofurantoin and tigecycline. Clin Microbiol Infect. 2008 Jan;14 Suppl 1:198-202.

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

Tel: 609-228-6898 Fax: 609-228-5909 E-mail: tech@MedChemExpress.com
Address: 1 Deer Park Dr, Suite Q, Monmouth Junction, NJ 08852, USA