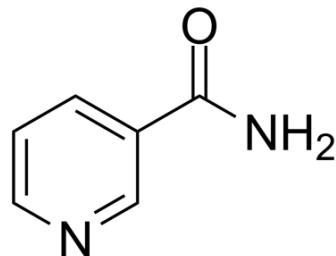


Nicotinamide

Cat. No.:	HY-B0150
CAS No.:	98-92-0
Molecular Formula:	C ₆ H ₆ N ₂ O
Molecular Weight:	122.12
Target:	Endogenous Metabolite; Sirtuin
Pathway:	Metabolic Enzyme/Protease; Cell Cycle/DNA Damage; Epigenetics
Storage:	4°C, protect from light * In solvent : -80°C, 6 months; -20°C, 1 month (protect from light)



SOLVENT & SOLUBILITY

In Vitro

DMSO : ≥ 100 mg/mL (818.87 mM)
 H₂O : ≥ 50 mg/mL (409.43 mM)
 * "≥" means soluble, but saturation unknown.

Preparing Stock Solutions	Solvent Concentration	Mass		
		1 mg	5 mg	10 mg
	1 mM	8.1887 mL	40.9433 mL	81.8867 mL
	5 mM	1.6377 mL	8.1887 mL	16.3773 mL
	10 mM	0.8189 mL	4.0943 mL	8.1887 mL

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

In Vivo

- Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
Solubility: ≥ 2.5 mg/mL (20.47 mM); Clear solution
- Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
Solubility: ≥ 2.5 mg/mL (20.47 mM); Clear solution
- Add each solvent one by one: 10% DMSO >> 90% corn oil
Solubility: ≥ 2.5 mg/mL (20.47 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Nicotinamide is a form of vitamin B3 that plays essential roles in cell physiology through facilitating NAD⁺ redox homeostasis and providing NAD⁺ as a substrate to a class of enzymes that catalyze non-redox reactions. Nicotinamide is an inhibitor of SIRT1.

IC₅₀ & Target

PARP-1 Human Endogenous Metabolite

In Vitro

Pretreatment with the poly (ADP-ribose) polymerase (PARP) inhibitor nicotinamide is able to prevent HCN2 cell death. When

nicotinamide is added prior to t-BuOOH, it is able to prevent neuronal cell death and inhibit apoptosis. Nicotinamide-pretreated neurons have higher expression levels of inhibitors of apoptosis (IAP) genes^[1]. Nicotinamide inhibits vasoconstriction by ET. Nicotinamide also alleviates oxidative stress, which exacerbates PE and FGR^[3]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

In Vivo

Normal and streptozotocin-nicotinamide induced adult male diabetic rats receive quercetin (10, 25 and 50 mg/kg/bw) orally, and cause significant decrease in FBG and cardiac injury marker levels with increased insulin levels^[2]. Nicotinamide improves maternal hypertension, proteinuria, and glomerular endotheliosis in RUPP mice. Moreover, nicotinamide prolongs pregnancies, and improves survival and growth of the embryos in RUPP PE mice^[3]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

PROTOCOL

Animal Administration ^[2]

DM is induced via a single intraperitoneal (i.p) injection of nicotinamide (110 mg/kg/body weight) dissolved in normal saline 15 min prior to streptozotocin (STZ) (55 mg/kg/body weight) injection, which is dissolved in a freshly prepared 0.1mol/L citrate buffer (pH 4.5). These injections are given following an overnight fast. Control rats (n=6) are injected with the same amount of solvent. In order to prevent hypoglycemia in the first 24 h following STZ injection, rats are allowed to have free access to water with 5% dextrose (D5W). Three days after STZ-nicotinamide injection, rats with FBG levels greater than 7.0 mM are considered as diabetic. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

CUSTOMER VALIDATION

- EMBO J. 2020 Jul 21;e104365.
- Autophagy. 2020 Jan 27:1-15.
- Theranostics. 2019 Apr 13;9(9):2424-2438.
- Oncogene. 2020 Mar;39(11):2437-2449.
- Hum Reprod. 2020 Mar 27;35(3):494-503.

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REFERENCES

- [1]. Bhansali SG, et al. Nicotinamide prevents apoptosis in human cortical neuronal cells. *Toxicol Mech Methods*. 2006;16(4):173-80.
- [2]. Roslan J, et al. Quercetin ameliorates oxidative stress, inflammation and apoptosis in the heart of streptozotocin-nicotinamide-induced adult male diabetic rats. *Biomed Pharmacother*. 2016 Dec 24;86:570-582
- [3]. Fushima T, et al. Nicotinamide ameliorates a preeclampsia-like condition in mice with reduced uterine perfusion pressure. *Am J Physiol Renal Physiol*. 2016 Dec 7;ajprenal.00501.2016
- [4]. Suzuki E, et al. Protective effect of nicotinamide against poly(ADP-ribose) polymerase-1-mediated astrocyte death depends on its transporter-mediated uptake. *Life Sci*. 2010 Apr 24;86(17-18):676-82.
- [5]. Peck B, et al. SIRT inhibitors induce cell death and p53 acetylation through targeting both SIRT1 and SIRT2. *Mol Cancer Ther*. 2010 Apr;9(4):844-55.

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