Nicotinamide Hydrochloride

Cat. No.: HY-B0150A

CAS No.: 25334-23-0

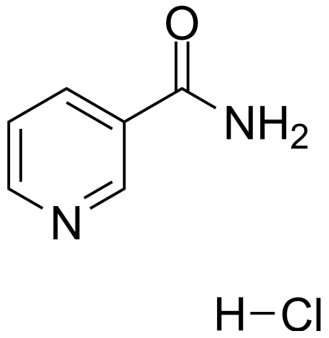
Molecular Formula: $C_6H_7ClN_2O$

Molecular Weight: 158.59

Target: Sirtuin; Endogenous Metabolite; HBV

Pathway: Cell Cycle/DNA Damage; Epigenetics; Metabolic Enzyme/Protease; Anti-infection

Storage: Please store the product under the recommended conditions in the Certificate of Analysis.



BIOLOGICAL ACTIVITY

Description

Nicotinamide Hydrochloride is a form of vitamin B3 or niacin. Nicotinamide Hydrochloride inhibits SIRT2 activity (IC_{50}: 2 μM). Nicotinamide Hydrochloride also inhibits SIRT1. Nicotinamide Hydrochloride increases cellular NAD_+, ATP, ROS levels. Nicotinamide Hydrochloride inhibits tumor growth and improves survival. Nicotinamide Hydrochloride also has anti-HBV activity[1][2][3][4].

IC_{50} & Target	Human Endogenous Metabolite	SIRT2 2 μM (EC50)	SIRT1 50-180 μM (IC_{50})

In Vitro

Nicotinamide Hydrochloride (0-50 mM, 24/48 h) reduces cell number in a time-dependent and dose-dependent manner in A375 and SK-MEL-28 cells[1].

Nicotinamide Hydrochloride (10-50 mM, 24 h) makes A375 cells undergo accumulation in G1 phase, reduction in S phase, and increase inthe sub-G1 (apoptosis) phase[1].

Nicotinamide Hydrochloride (1-50 mM, 6 h) increases NAD_+, ATP and ROS levels in A375 and SK-MEL-28 cells[1].

Nicotinamide Hydrochloride (0.01-20 mM, 1 h) inhibits purified SIRT2 enzymatic activity in vitro with an EC_{50} of 2 μM[1].

Nicotinamide Hydrochloride (0-64 mM) inhibits HBV replication in HepAD38 and HepG2.2.15 cells[3].

Nicotinamide Hydrochloride (10 mM, on day 13) promotes pancreatic cell differentiation from human embryonic stem cells (hESCs) through CK1 and ROCK inhibition[4].

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

Cell Viability Assay[1]

Cell Line:	A375, SK-MEL-28, mouse B16-F10 cell
Concentration:	0, 1, 20, 50 mM
Incubation Time:	24 h, 48 h
Result:	Reduced cell number in a dose-dependent manner with a strong inhibitory effect at 20mM and an almost complete effect at 50 mM.

Cell Cycle Analysis[1]

Cell Line:	A375, SK-MEL-28

Concentration:	10, 20, 50 mM
Incubation Time:	24 h
Result:	Arrested A375 cells in G1 phase.

In Vivo

Nicotinamide Hydrochloride (Intraperitoneal injection, 1500 and 1800 mg/Kg, 5 days per week) inhibits tumor growth in murine metastatic melanoma model[1].

Nicotinamide Hydrochloride (Intraperitoneal injection, 1800 mg/Kg, once a day, murine metastatic melanoma model) affects IFN-γ (a key mediator of cell-mediated anti-tumor immunity), increases the plasma levels of Eotaxin and IL-5, reduces the plasma levels of IL-3, IL-12, RANTES and IL-10[1].

Nicotinamide Hydrochloride (vein injection, 0-200 mg/kg, 5 days) inhibits HBV replication in HBV-transgenic mice[3].

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

Animal Model:	C57BL/6 mice (subcutaneous injected with B16-F10 cells)[1]
Dosage:	1000, 1500, 1800 mg/Kg.
Administration:	Intraperitoneal injection, 5 days per week (followed by 2-day rest) or once a day.
Result:	Inhibited tumor growth at 1500 and 1800 mg/Kg, and had no effect on the body weight. Increased the frequency of IFN-γ producing cells and modulated the protein levels of cytokines and chemokines in the plasma of tumor-bearing mice.

Animal Model:	HBV-transgenic mice[3]
Dosage:	0-200 mg/kg
Administration:	Vein injection, 5 days
Result:	Reduced serum HBV DNA.

CUSTOMER VALIDATION

- Nat Genet. 2023 Nov 20.
- Cell Stem Cell. 2022 Sep 1;29(9):1366-1381.e9.
- Circ Res. 2022 Aug 19;131(5):456-472.
- Nat Commun. 2023 Sep 22;14(1):5917.
- Nat Commun. 2021 Sep 20;12(1):5548.

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REFERENCES

[1]. Hwang ES, et al. Nicotinamide is an inhibitor of SIRT1 in vitro, but can be a stimulator in cells. Cell Mol Life Sci. 2017 Sep;74(18):3347-3362.

[2]. Li WY, et al. The SIRT1 inhibitor, nicotinamide, inhibits hepatitis B virus replication in vitro and in vivo. Arch Virol. 2016 Mar;161(3):621-30.

[3]. Zhang Y, et al. Nicotinamide promotes pancreatic differentiation through the dual inhibition of CK1 and ROCK kinases in human embryonic stem cells. Stem Cell Res Ther. 2021 Jun 25;12(1):362.

[4]. Francesca Scatozza, et al. Nicotinamide inhibits melanoma in vitro and in vivo. J Exp Clin Cancer Res. 2020 Oct 7;39(1):211.

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