Polyinosinic-polycytidylic acid

Cat. No.: HY-107202

CAS No.: 24939-03-5

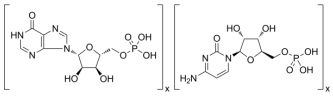
Molecular Formula: $(C_{10}H_{13}N_4O_8P)x.(C_9H_{14}N_3O_8P)x$

Target: Toll-like Receptor (TLR); PKD; HSP; Bcl-2 Family; Interleukin Related

Pathway: Immunology/Inflammation; Apoptosis; Cell Cycle/DNA Damage; Metabolic Enzyme/Protease

Storage:

Powder	-20°C	3 years
In solvent	-80°C	6 months
	-20°C	1 month



SOLVENT & SOLUBILITY

In Vitro	H_2O : 50 mg/mL (Need ultrasonic)
In Vivo	1. Add each solvent one by one: PBS Solubility: 100 mg/mL (Infinity mM); Clear solution; Need ultrasonic

BIOLOGICAL ACTIVITY

Description

Polyinosinic-polycytidylic acid (Poly (I:C)), a synthetic analog of double-stranded RNA, is an agonist of toll-like receptor (TLR)-3. Polyinosinic-polycytidylic acid facilitates tumor regression and has a disruptive effect on the airway epithelial barrier. Polyinosinic-polycytidylic acid has protective effects against cerebral ischemia/reperfusion (I/R) injury and can be used as vaccine adjuvant to enhance innate and adaptive immune responses [1][2][3][4][5].

IC_{50} & Target

Bcl-2	Bax	IL-17A	IL-13
HSP70			

In Vitro

Polyinosinic-polycytidylic acid (0.5-5 μg/mL, 3-24 h) induces a dose- and time-dependent increase in paracellular permeability of immortalized airway epithelial cells[4].
Polyinosinic-polycytidylic acid (5 μg/mL, 24 h) does not have cytotoxicity to 16HBE14o- cells[4].
Polyinosinic-polycytidylic acid (5 μg/mL, 6 h) induces disruption of epithelial apical junctional complexes(AJCs) and tight junctions (TJs) in 16HBE14o- cells[4].

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

Cell Cytotoxicity Assay[4]

Cell Line:	16HBE14o- cells
Concentration:	5 μg/mL
Incubation Time:	24 h
Result:	Did not lead to significant accumulation of LDH in cell-culture medium

In Vivo

Polyinosinic-polycytidylic acid (2.5-10 mg/mL, Stereotaxic injection, single dose) induces a sustained inflammatory reaction in the substantia nigra (SN) and in the dorsolateral striatum. [2].
Polyinosinic-polycytidylic acid (10 μg/mouse, Intraperitoneal injection, single dose) decreases lung tumor growth in mice[3].
Polyinosinic-polycytidylic acid (1.25 mg/kg, Intraperitoneal injection, single dose) exerts therapeutic effects against cerebral I/R injury through the downregulation of TLR4/MyD88 signaling via TLR3 in MCAO model mice[5].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Animal Model:	lung tumor-bearing mice[3]
Dosage:	10 μg/mouse
Administration:	Intraperitoneal injection (i.p.)
Result:	Induced a significant decrease in the growth of pulmonary metastases in tumor-bearing mice. Reduced the amount of lung foci to ≈ 40%. Significantly increased BAL fluid cell numbers. Increased the level of INF-γ and IL-17A, decreased the levels of IL-13. Increased TLR3 expression.

Animal Model:	Middle cerebral artery occlusion (MCAO) model mice[5]
Dosage:	1.25 mg/kg
Administration:	Intraperitoneal injection (i.p.)
Result:	Reduced focal cerebral I/R injury. Increased the expression of Bcl2, Hsp27, and Hsp70, decreased Bax expression, and reduced cellular degeneration and apoptosis. Protected against cerebral ischemia and conferred protection against cerebral I/R injury through the downregulation of TLR4 signaling via TLR3.

CUSTOMER VALIDATION

- Adv Funct Mater. 29 August 2022.
- Chem Eng J. 2021 Aug 15;418:129392.
- Phytomedicine. 2021, 153495.
- Liver Int. 2022 Oct 17.
- Mol Ther Oncolytics. 25 August 2022.

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[1]. Cheng Y, Xu F. Anticancer function of polyinosinic-polycytidylic acid [J]. Cancer biology & therapy, 2010, 10(12): 1219-1223.

[2]. Deleidi M, Hallett P J, Koprich J B, et al. The Toll-like receptor-3 agonist polyinosinic: polycytidylic acid triggers nigrostriatal dopaminergic degeneration [J]. Journal of Neuroscience, 2010, 30(48): 16091-16101.

[3]. Forte G, Rega A, Morello S, et al. Polyinosinic-polycytidylic acid limits tumor outgrowth in a mouse model of metastatic lung cancer [J]. The Journal of Immunology,

2012, 188(11): 5357-5364.

[4]. Rezaee F, Meednu N, Emo J A, et al. Polyinosinic: polycytidylic acid induces protein kinase D–dependent disassembly of apical junctions and barrier dysfunction in airway epithelial cells [J]. Journal of Allergy and Clinical Immunology, 2011, 128(6): 1216-1224. e11.

[5]. Wang P F, Fang H, Chen J, et al. Polyinosinic-polycytidylic acid has therapeutic effects against cerebral ischemia/reperfusion injury through the downregulation of TLR4 signaling via TLR3 [J]. The Journal of Immunology, 2014, 192(10): 4783-4794.

[6]. Alexopoulou L, Holt AC, Medzhitov R, Flavell RA. Recognition of double-stranded RNA and activation of NF-kappaB by Toll-like receptor 3. Nature. 2001;413(6857):732-738.

[7]. Matsumoto M, Kikkawa S, Kohase M, Miyake K, Seya T. Establishment of a monoclonal antibody against human Toll-like receptor 3 that blocks double-stranded RNA-mediated signaling. Biochem Biophys Res Commun. 2002;293(5):1364-1369.

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