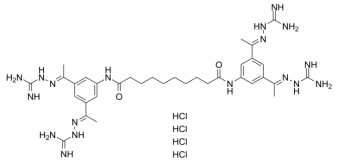
Semapimod tetrahydrochloride

Cat. No.:	HY-15509A
CAS No.:	164301-51-3
Molecular Formula:	$C_{34}H_{56}Cl_4N_{18}O_2$
Molecular Weight:	891
Target:	p38 MAPK; Interleukin Related; TNF Receptor
Pathway:	MAPK/ERK Pathway; Immunology/Inflammation; Apoptosis
Storage:	-20°C, sealed storage, away from moisture and light * In solvent : -80°C, 6 months; -20°C, 1 month (sealed storage, away from moisture and light)



SOLVENT & SOLUBILITY

In Vitro

H_2O : 2.17 mg/mL (2.44 mM; ultrasonic and warming and heat to 60°C)

Preparing Stock Solutions	Mass / Solvent / Concentration	1 mg	5 mg	10 mg
	1 mM	1.1223 mL	5.6117 mL	11.2233 mL
	5 mM	---	---	---
	10 mM	---	---	---

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

BIOLOGICAL ACTIVITY

Description

Semapimod tetrahydrochloride (CNI-1493), an inhibitor of proinflammatory cytokine production, can inhibit TNF-α, IL-1β, and IL-6. Semapimod tetrahydrochloride inhibits TLR4 signaling (IC_{50}≈0.3 μM). Semapimod tetrahydrochloride inhibits p38 MAPK and nitric oxide production in macrophages. Semapimod tetrahydrochloride has potential in a variety of inflammatory and autoimmune disorders[1][2][3].

IC_{50} & Target	IL-1β	IL-6	p38 MAPK

In Vitro

Semapimod tetrahydrochloride leads to a significant decrease of p38-MAPK phosphorylation in macrophages, proinflammatory gene expression of macrophage inflammatory protein-1alpha, interleukin-6, monocyte chemoattractant protein-1, and intercellular adhesion molecule-1, and neutrophil infiltration. Semapimod tetrahydrochloride completely abrogated nitric oxide production within the tunica muscularis[2].

Semapimod tetrahydrochloride desensitizes TLR signaling via its effect on the TLR chaperone gp96. Semapimod tetrahydrochloride inhibits ATP-binding and ATPase activities of gp96 in vitro (IC_{50}≈0.2-0.4 μM). Semapimod tetrahydrochloride desensitizes TLR signaling via its effect on the TLR chaperone gp96[3].

Semapimod (0-500 nM) inhibits microglia-stimulated GL261 invasion[4].

Semapimod (0-10 μM) dose not affect serum-stimulated glioblastoma cell invasion, even at 10 μM, underlining the

selectivity of semapimod for cells from the monocytic lineage[4].
Semapimod (200 nM) does not affect microglia-stimulated glioblastoma cell proliferation[4].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

In Vivo

Semapimod tetrahydrochloride (5 mg/kg; i.p; daily for 2 weeks) ameliorates endothelial dysfunction in Obese Zucker (OZ) rats[1].
Semapimod tetrahydrochloride restores AM-induced akt phosphorylation and cGMP production in OZ rats[1].
Semapimod (6 mg/kg/day, Intracranially for 1 week) inhibits glioblastoma cell invasion in vivo[4].
Semapimod (intracranially administered, 2 weeks) semapimos strongly increases the survival of GL261 tumor-bearing animals in combination with radiation, but has no significant benefit in the absence of radiation[4].
MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Animal Model:	Male OZ rats[1]
Dosage:	5 mg/kg
Administration:	I.p; daily for 2 weeks
Result:	Restored endothelium-dependent vasorelaxation in OZ rats.

Animal Model:	C57Bl/6 mice (GL261 cells were orthotopically implanted)[4]
Dosage:	6 mg/kg/day
Administration:	Intracranially for 1 week, delivered via an osmotic pump
Result:	Inhibited tumor cell invasion by more than 75%.

REFERENCES

[1]. Miller IS, et al. Semapimod sensitizes glioblastoma tumors to ionizing radiation by targeting microglia. PLoS One. 2014 May 9;9(5):e95885.

[2]. Wehner S, Set al. Inhibition of p38 mitogen-activated protein kinase pathway as prophylaxis of postoperative ileus in mice. Gastroenterology. 2009;136(2):619-629.

[3]. Nishimatsu H, et al. Blockade of endogenous proinflammatory cytokines ameliorates endothelial dysfunction in obese Zucker rats. Hypertens Res. 2008;31(4):737-743.

[4]. Wang J, et al. Experimental Anti-Inflammatory Drug Semapimod Inhibits TLR Signaling by Targeting the TLR Chaperone gp96. J Immunol. 2016;196(12):5130-5137.

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

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