Sodium metatungstate

Cat. No.:	HY-103259
CAS No.:	12141-67-2
Molecular Formula:	$H_2Na_6O_{40}W_{12}$
Molecular Weight:	2986.01
Target:	Phosphatase; P2X Receptor; P2Y Receptor; Pyroptosis; Interleukin Related
Pathway:	Metabolic Enzyme/Protease; Membrane Transporter/Ion Channel; GPCR/G Protein; Apoptosis; Immunology/Inflammation
Storage:	4°C, sealed storage, away from moisture * In solvent : -80°C, 6 months; -20°C, 1 month (sealed storage, away from moisture)

$3Na_2WO_4.9WO_3$

SOLVENT & SOLUBILITY

In Vitro

H_2O : 50 mg/mL (16.74 mM; Need ultrasonic)
DMSO : 50 mg/mL (16.74 mM; Need ultrasonic)

Preparing Stock Solutions	Solvent / Mass / Concentration	1 mg	5 mg	10 mg
	1 mM	0.3349 mL	1.6745 mL	3.3490 mL
	5 mM	0.0670 mL	0.3349 mL	0.6698 mL
	10 mM	0.0335 mL	0.1674 mL	0.3349 mL

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

In Vivo

1. Add each solvent one by one: PBS
   Solubility: 100 mg/mL (33.49 mM); Clear solution; Need ultrasonic
2. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 2.5 mg/mL (0.84 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.5 mg/mL (0.84 mM); Clear solution
4. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.5 mg/mL (0.84 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Sodium metatungstate (Sodium polyoxotungstate) is a NTPDase inhibitor, with K_i values of 2.58 μM, 3.26 μM, and 28.8 μM for NTPDase 1 (CD39), NTPDase 3 and NTPDase 2 respectively[1]. Sodium metatungstate has anti-inflammatory and anti-cancer effect. Sodium metatungstate inhibits ATP breakdown but also blocks central synaptic transmission[1][2][3][4].

IC_{50} & Target	IL-1β	IL-1β	P2X7 Receptor

In Vitro	Sodium metatungstate (100 μM, 15 min) inhibits the ATP-induced uptake of anionic dyes and the large ATP-induced channels in macrophage[2]. Sodium metatungstate (100 μM, 8 h) inhibits ATP-induced P2X7-associated pyroptosis in macrophage[2]. Sodium metatungstate (100 μM, 8-24 h) has a potent anti-inflammatory effect on macrophages[2]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
In Vivo	Sodium metatungstate (5 mg/kg, Intraperitoneal injection, single dose) shows different cytokine/chemokine responses in the peritoneum and systemically in the bloodstream in CD39 knockout mice[3]. Sodium metatungstate (5 mg/kg, Intraperitoneal injection, once per day from 0 to day 4, day 7-11, and day 14-18.) combine with anti-CD73 antibody and AZD4635(HY-101980) reduces tumor load in multiple myeloma (MM) mice[4]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Animal Model:	Multiple myeloma (MM) mice developed by 3 weeks of injection of 5t33MM cells[4]
Dosage:	5 mg/kg
Administration:	Intraperitoneal injection (i.p.)
Result:	Had significantly lower spleen weights, fewer tumor cells in the spleen as well as significantly lower monoclonal immunoglobulin component level in circulation.

CUSTOMER VALIDATION

- Front Immunol. 2022, 13: Online ahead of print.
- J Invest Dermatol. 2021 Sep 16;S0022-202X(21)02210-7.
- Eur J Pharmacol. 2021 Dec 29;174729.
- Eur J Pharmacol. 2021 May 23;174198.

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REFERENCES

[1]. Wall M J, et al. The novel NTPDase inhibitor sodium polyoxotungstate (POM-1) inhibits ATP breakdown but also blocks central synaptic transmission, an action independent of NTPDase inhibition [J]. Neuropharmacology, 2008, 55(7): 1251-1258.

[2]. Pimenta-dos-Reis G, et al. POM-1 inhibits P2 receptors and exhibits anti-inflammatory effects in macrophages [J]. Purinergic Signalling, 2017, 13: 611-627.

[3]. Csóka B, et al. CD39 improves survival in microbial sepsis by attenuating systemic inflammation [J]. The FASEB Journal, 2015, 29(1): 25.

[4]. Yang R, et al. Conversion of ATP to adenosine by CD39 and CD73 in multiple myeloma can be successfully targeted together with adenosine receptor A2A blockade [J]. Journal for immunotherapy of cancer, 2020, 8(1).

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