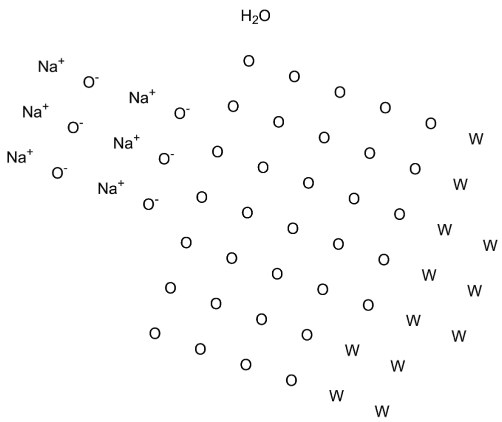
Product Data Sheet

Product Name: POM 1

Cat. No.: GC17027

Chemical Properties

Cas. No.	12141-67-2		
SMILES	[Na+].[Na+].[Na+].[Na+].[Na+].[Na+].O.[O].[O].[O].[O].[O].[O].[O].[O].[O].[O].[O].[O].[O].[O].[O].[O].[O].[O].[O].[O].[O].[O].[O].[O].[O].[O].[O].[O].[O].[O].[O].[O].[O].[O-].[O-].[O-].[O-].[O-].[O-].[W].[W].[W].[W].[W].[W].[W].[W].[W].[W].[W].[W]		
Formula	$H_2O_{40}Na_6W_{12}$	M.Wt	2986.01
Solubility	≥ 149.3mg/mL in DMSO with ultrasonic≥50mg/mL in Water	Storage	Store at RT
General tips	For obtaining a higher solubility , please warm the tube at 37 °C and shake it in the ultrasonic bath for a while.Stock solution can be stored below -20°C for several months.		
Shipping Condition	Evaluation sample solution : ship with blue ice All other available size: ship with RT , or blue ice upon request.		
Structure			



Protocol

Cell experiment [1]:

Cell lines Macrophages

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

Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com
Address: 10292 Central Ave. #205, Montclair, CA, USA

Product Data Sheet

Preparation Method	Macrophages (5×10^5/well plated in 96-well plates) were treated or not with LPS (at the concentrations indicated) for 24h, with or without of 100μM POM 1. After this time, the culture supernatants were collected for measurement of the amount of nitrite using the Griess colorimetric method.
Reaction Conditions	100μM; 24h
Applications	POM-1 inhibits LPS-induced NO production.

Animal experiment [2]:

Animal models	C57BL/KalwRij mice
Preparation Method	Mice were injected intravenously on day 0 with 2×10^5 5T33 MM cells and treated intraperitoneally with 10mg/kg monoclonal anti-CD73 antibody on days 2, 4, 8, 11, 15, and 18. Of note, 5mg/kg of POM 1 was injected intraperitoneally once per day from 0 to day 4, day 7-11, and day 14-18. Number of tumor cells in the spleen was determined using FACS analysis.
Dosage form	5mg/kg; i.p.
Applications	Mice treated with the CD39 inhibitor POM 1 had significantly reduced spleen weight and fewer tumor cells in the spleen.

Caution: Product has not been fully validated for medical applications. For research use only.
Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com
Address: 10292 Central Ave. #205, Montclair, CA, USA

Product Data Sheet

References:
[1]Pimenta-dos-Reis G, Torres E J L, Quintana P G, et al. POM-1 inhibits P2 receptors and exhibits anti-inflammatory effects in macrophages[J]. Purinergic Signalling, 2017, 13: 611-627.
[2]Yang R, Elsaadi S, Misund K, 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).

Background

POM 1 is a nucleoside triphosphate diphosphohydrolase (NTPDase) inhibitor with K_i values of 2.58μM, 3.26μM and 28.8μM for NTPDase1 (CD39), NTPDase3 and NTPDase2, respectively[1]. POM 1 can inhibit ATP decomposition, but also blocks central synaptic transmission, an effect that is independent of NTPDase inhibition[2]. POM 1 is an inorganic compound that can be used to make heavy liquids and is widely used for density separation[3].

In vitro, POM 1 (100μM) treatment of macrophages for 24h inhibited intracellular ectonucleotidase activity, inhibited the increase in intracellular free Ca^{2+} caused by nucleotides, inhibited ATP-induced P2X7-related cell pyroptosis, and inhibited LPS-induced NO production[4]. POM 1 (5μM) treatment of H1299 and A549 cells for 24h significantly increased lipid peroxide levels and increased the expression of ferroptosis-related proteins[5].

In vivo, intraperitoneal injection of POM 1 (5mg/kg) in multiple myeloma (MM) model mice significantly reduced spleen weight and the number of tumor cells in the spleen[6]. Intraperitoneal injection of POM 1 (250μg) in CD39-deficient and wild-type mice significantly increased the number of natural killer (NK) cells and enhanced effector function[7].

References:
[1] Müller C E, Iqbal J, Baqi Y, et al. Polyoxometalates—a new class of potent ecto-nucleoside triphosphate diphosphohydrolase (NTPDase) inhibitors[J]. Bioorganic & medicinal chemistry letters, 2006, 16(23): 5943-5947.
[2] Wall M J, Wigmore G, Lopatář J, et al. The novel NTPDase inhibitor sodium polyoxotungstate (POM-1) inhibits ATP breakdown but also blocks central synaptic transmission, an action

Product Data Sheet

independent of NTPDase inhibition[J]. Neuropharmacology, 2008, 55(7): 1251-1258.
[3] Savage N M. The use of sodium polytungstate for conodont separations[J]. Journal of Micropalaeontology, 1988, 7(1): 39-40.
[4] Pimenta-dos-Reis G, Torres E J L, Quintana P G, et al. POM-1 inhibits P2 receptors and exhibits anti-inflammatory effects in macrophages[J]. Purinergic Signalling, 2017, 13: 611-627.
[5] Lin J W, Zhou Y, Xiao H P, et al. Antitumor effects of a Sb-rich polyoxometalate on non-small-cell lung cancer by inducing ferroptosis and apoptosis[J]. Chemical Science, 2024, 15(37): 15367-15376.
[6] Yang R, Elsaadi S, Misund K, 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).
[7] Zhang H, Vijayan D, Li X Y, et al. The role of NK cells and CD39 in the immunological control of tumor metastases[J]. Oncoimmunology, 2019, 8(6): e1593809.

Caution: Product has not been fully validated for medical applications. For research use only.
Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com
Address: 10292 Central Ave. #205, Montclair, CA, USA