

Product Name: POM 1
Cat. No.: GC17027

Cas. No. 12141-67-2

[illegible]

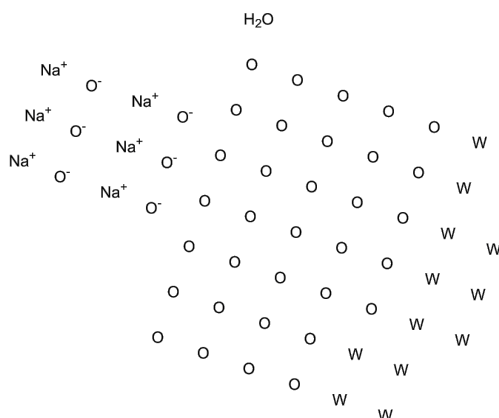
Formula	H ₂ O ₄₀ Na ₆ W ₁₂	M.Wt	2986.01
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Solubility	≥ 149.3mg/mL in DMSO with ultrasonic ≥50mg/mL in Water	Storage	Store at RT
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General tips	For obtaining a higher solubility , please warm the tube at 37 °C and shake it in the ultrasonic bath for a while. Stock solution can be stored below -20°C for several months.
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Shipping Condition	Evaluation sample solution : ship with blue ice All other available size: ship with RT , or blue ice upon request.
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Structure



Cell experiment [1]:

Cell lines Macrophages

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

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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 100 μ M POM 1. After this time, the culture supernatants were collected for measurement of the amount of nitrite using the Griess colorimetric method.

Reaction Conditions 100 μ M; 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.

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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 2.58 μ M, 3.26 μ M and 28.8 μ M 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 (100 μ M) 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 (5 μ M) 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 (250 μ g) 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

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- 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.

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