
Product Data Sheet

Product Name: Glatiramer acetate

Cat. No.: GC14501

Chemical Properties

Cas. No. 147245-92-9

Formula $(C_9H_{11}NO_3.C_6H_{14}N_2O_2.C_5H_9NO_4.C_3H_7NO_2)_x.xC_2H_4O_2$ M.Wt 4700-11,000 Da

Solubility 33.33 mg/ml in Water (Need ultrasonic) Storage 4°C, sealed storage, away from moisture

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 THP-1 cells

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Preparation Method	<p>Before starting the experiments, the cells were grown for 1 day after subculturing. Subculturing was done by harvesting the cells, resuspending in cell culture medium and culturing them at 5×10^5 cell/ml. Differentiation of THP-1 cells was assessed by observing adherence and cell morphology. Cells were incubated with lipopolysaccharide and where indicated, glatiramer acetate for 24 h, then the medium was removed and replaced with fresh medium containing interferon-γ.</p>
Reaction Conditions	20 $\mu\text{g/ml}$ for 24 hours
Applications	<p>Glatiramer acetate at a non-toxic concentration of 20 $\mu\text{g/ml}$ inhibited tumor necrosis factor-α production by 80%, but stimulated the production of interleukin- 1β by approximately 50%.</p>
Animal experiment [2]:	
Animal models	LPS-induced memory impairment mice model

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Preparation Method	<p>In Y-maze, Glatiramer acetate (10, 2.5, 0.625, 0.153, and 0.03 mg/kg, s.c.; 250 µg/mouse; i.c.v.) was administered 10 min following LPS, and spatial memory was assayed in Y-maze apparatus. In passive avoidance, LPS (100, 250 µg/kg; i.p.) was injected 4 h before receiving foot shock, and Glatiramer acetate (10, 2.5; s.c.) or (250 µg/mouse; i.c.v.) was administered 4 h before the shock. Following 24 h, the fear memory was evaluated.</p>
Dosage form	<p>10, 2.5, 0.625, 0.153, and 0.03 mg/kg, s.c.; 250 µg/mouse; i.c.v.; 100, 250 µg/kg; i.p.</p>
Applications	<p>Glatiramer acetate (250 µg/mouse, i.c.v.) and Glatiramer acetate (10, 2.5 mg/kg; s.c.) in Y-maze reversed memory impairment (LPS 100 µg/kg, i.p.). In passive-avoidance task, Glatiramer acetate (2.5, 10 mg/kg; s.c.) reversed LPS-induced impairment and the mice showed significantly longer latency times during the retention trial.</p>

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References:

[1]: Li Q, Milo R, Panitch H, Swoveland P, Bever Jr CT. Glatiramer acetate blocks the activation of THP-1 cells by interferon- γ . European journal of pharmacology. 1998 Jan 26;342(2-3):303-10.

[2]: Mohammadi F, Rahimian R, Fakhraei N, Rezayat SM, Javadi-Paydar M, Dehpour AR, Afshari K, Ejtemaei Mehr S. Effect of glatiramer acetate on short-term memory impairment induced by lipopolysaccharide in male mice. Fundamental & Clinical Pharmacology. 2016 Aug;30(4):347-56.

Background

Glatiramer acetate (GA), also known as copolymer-1 (COP-1), is a random mixture of synthetic polypeptides composed of four amino acids (L-glutamic acid, L-lysine, L-alanine, and L-tyrosine) in a residue molar ratio 4.2:3.4:1.4:1.0, with an average molecular mass of 4700-11,000 Da. These amino acids resemble myelin basic protein (MBP), and Glatiramer acetate has been shown to be effective in preventing and suppressing experimental autoimmune encephalomyelitis (EAE), the animal model of multiple sclerosis [1,2].

In vitro studies have shown that Glatiramer acetate competes with myelin peptides from binding to major histocompatibility (MHC) molecules and is able to displace MBP peptides from antigen presenting cells (APC) [3]. Glatiramer acetate inhibits MHC II assisted activation of myelin specific T cells [4]. Glatiramer acetate -treated (1-10 μ g/ml)

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dendritic cells were able to shift the phenotype of naive T cells towards TH2 like T cells. In addition Glatiramer acetate inhibited the secretion of IL-12 and TNF- α by human dendritic cells and macrophages [5]. In addition to competition for binding to MHC molecules and thus inhibiting the T cell response to several myelin antigens, Glatiramer acetate is proposed to act as an antagonist to MBP/MHC at MBP-specific T cell receptors (TCR). It was demonstrated to operate as an "altered peptide ligand" to the 82-100 epitope of MBP [6].

Glatiramer acetate (250 μ g/mouse, i.c.v.) and Glatiramer acetate (10, 2.5 mg/kg; s.c.) in Y-maze reversed memory impairment (LPS 100 μ g/kg, i.p.). In passive-avoidance task, Glatiramer acetate (2.5, 10 mg/kg; s.c.) reversed LPS-induced impairment and the mice showed significantly longer latency times during the retention trial [7]. 2 mg/mouse of Glatiramer acetate prevented the manifestation of EAE altogether, the doses of 200 and 500 μ g of Glatiramer acetate were considered suboptimal in preventing EAE, 250 μ g/mouse (equivalent to 10 mg/kg) [8].

References:

- [1]. Schrempf W, Ziemssen T. Glatiramer acetate: mechanisms of action in multiple sclerosis. *Autoimmunity reviews*. 2007 Aug 1;6(7):469-75.
- [2]. Habisch HJ, SchwalenstÖcker B, Danzeisen R, Neuhaus O, Hartung HP, Ludolph A. Limited effects of glatiramer acetate in the high-copy number hSOD1-G93A mouse model of ALS. *Experimental neurology*. 2007 Aug 1;206(2):288-95.
- [3]. Fridkis-Hareli M, Teitelbaum D, Gurevich E, Pecht I, Brautbar C, Kwon OJ, Brenner T, Arnon R, Sela M. Direct binding of myelin basic protein and synthetic copolymer 1 to class II major histocompatibility complex molecules on living antigen-presenting cells--specificity and promiscuity. *Proceedings of the National Academy of Sciences*. 1994 May 24;91(11):4872-6.
- [4]. Gran B, Tranquill LR, Chen M, Bielekova B, Zhou W, Dhib-Jalbut S, Martin R. Mechanisms of immunomodulation by glatiramer acetate. *Neurology*. 2000 Dec 12;55(11):1704-14.
- [5]. Vieira PL, Heystek HC, Wormmeester J, Wierenga EA, Kapsenberg ML. Glatiramer acetate (copolymer-1, copaxone) promotes Th2 cell development and increased IL-10 production through modulation of dendritic cells. *The Journal of Immunology*. 2003 May 1;170(9):4483-8.
- [6]. Aharoni R, Teitelbaum D, Arnon R, Sela M. Copolymer 1 acts against the

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immunodominant epitope 82-100 of myelin basic protein by T cell receptor antagonism in addition to major histocompatibility complex blocking. Proceedings of the National Academy of Sciences. 1999 Jan 19;96(2):634-9.

[7]. Mohammadi F, Rahimian R, Fakhraei N, Rezayat SM, Javadi-Paydar M, Dehpour AR, Afshari K, Ejtemaei Mehr S. Effect of glatiramer acetate on short-term memory impairment induced by lipopolysaccharide in male mice. Fundamental & Clinical Pharmacology. 2016 Aug;30(4):347-56.

[8]. Giuliani F, Metz LM, Wilson T, Fan Y, Bar-Or A, Yong VW. Additive effect of the combination of glatiramer acetate and minocycline in a model of MS. Journal of neuroimmunology. 2005 Jan 1;158(1-2):213-21.

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