

Product Data Sheet

Product Name: Adenosine deaminase

Cat. No.: GC35250

Chemical Properties

Cas. No. 9026-93-1

SMILES [Adenosine deaminase]

Formula M.Wt ~33 kDa (SDS-PAGE)

Solubility Buffered aqueous glycerol solution Storage Store at -20°C

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

Animal experiment [1]:

Animal models SD rat

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

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Preparation method Adenosine deaminase was PEGylated. Following one month from diabetes induction in rats, adenosine deaminase (5 U/kg) was administered weekly by intraperitoneal injection for a four-week period.

Dosage form 5 U/kg; i.p.

Applications In the urine of diabetic rats that were treated with Adenosine deaminase, a significant decrease in the amount of the inflammatory cytokines IL-1 β , IL-6, and IL-18.

References:

[1] Garrido W, Jara C, Torres A, et al. Blockade of the adenosine A3 receptor attenuates caspase 1 activation in renal tubule epithelial cells and decreases interleukins IL-1 β and IL-18 in diabetic rats[J]. International Journal of Molecular Sciences, 2019, 20(18): 4531.

Background

Adenosine deaminase (ADA) is a key enzyme involved in the purine metabolic pathway. It has an irreversible deamination effect on adenosine and deoxyadenosine, converting them into inosine and deoxyinosine, respectively [1]. Adenosine deaminase has been found in bacteria, plants, invertebrates, vertebrates and mammals, and its amino acid sequence is highly conserved [2]. Adenosine deaminase is a signaling molecule associated with T lymphocyte activation, making it a useful marker of inflammation, especially meningitis and pleurisy [3]. The main function of adenosine deaminase in the human body is the development and maintenance of the immune system. Hereditary adenosine deaminase deficiency reduces the differentiation and maturation of lymphoid cells, leading to lymphocytopenia and severe combined immunodeficiency disease (SCID) [4]. This product is provided in powder form and is reconstituted with 20% glycerol in water. It has an activity of 150 units/mg, is stable at pH 7.0-9.0, and has a molecular weight of 33kDa (SDS-PAGE).

In vitro, adenosine deaminase (3 units/ml) can be added to cell culture media to remove exogenous adenosine for cyclic adenosine monophosphate (cAMP) measurement [5]. In vivo, pegylated

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adenosine deaminase (5 U/kg) treatment of streptozotocin (STZ)-induced diabetic rats for 4 weeks significantly reduced the amounts of inflammatory cytokines IL-1 β , IL-6, and IL-18, alleviated proteinuria, and reduced the levels of the profibrotic marker α -SMA in renal tissue [6].

References:

- [1] Sauer A V, Brigida I, Carriglio N, et al. Autoimmune dysregulation and purine metabolism in adenosine deaminase deficiency[J]. *Frontiers in immunology*, 2012, 3: 265.
- [2] Cristalli G, Costanzi S, Lambertucci C, et al. Adenosine deaminase: functional implications and different classes of inhibitors[J]. *Medicinal research reviews*, 2001, 21(2): 105-128.
- [3] Silva Dalsasso Joaquim L, Granzotto N, Dos Santos L F, et al. Analytical validation of an in-house method for adenosine deaminase determination[J]. *Journal of Clinical Laboratory Analysis*, 2019, 33(3): e22823.
- [4] Bradford K L, Moretti F A, Carbonaro-Sarracino D A, et al. Adenosine deaminase (ADA)-deficient severe combined immune deficiency (SCID): molecular pathogenesis and clinical manifestations[J]. *Journal of clinical immunology*, 2017, 37: 626-637.
- [5] Iyer S V, Ranjan A, Elias H K, et al. Genome-wide RNAi screening identifies TMIGD3 isoform1 as a suppressor of NF- κ B and osteosarcoma progression[J]. *Nature Communications*, 2016, 7(1): 13561.
- [6] Garrido W, Jara C, Torres A, et al. Blockade of the adenosine A3 receptor attenuates caspase 1 activation in renal tubule epithelial cells and decreases interleukins IL-1 β and IL-18 in diabetic rats[J]. *International Journal of Molecular Sciences*, 2019, 20(18): 4531.

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