Miltenyi Biotec

Human IL-2 IS
research grade

Contents

1. Description

Products

Human IL-2 IS, research grade.

Recombinant human interleukin 2 IS (improved sequence).

Content in µg	Order no.
10	130-097-742
50	130-097-743

Biological activity

The ED_{50} is ≤0.3 ng/mL corresponding to an activity of ≥3×10^6 IU/mg.

▲ **Note:** The ED_{50} is determined by proliferation assay using CTLL-2 cells. The proliferation assay was calibrated with the reference standard for human IL-2 (NIBSC code 86/500) provided by the WHO/National Institute for Biological Standards and Control. Biological activity is ≥1.7×10^7 IU/mg when calibrated with Proleukin®.

Primary structure

Single, non-glycosylated polypeptide chain (133 amino acid residues) without N-terminal methionine and a Cys to Ser substitution at amino acid position 125.

Molecular mass

15.4 kDa.

Source

Produced in *E. coli*.

Product format

Lyophilized from a filtered (0.2 µm) buffer solution.

Stabilizer

Mannitol and trehalose.

Purity

>95% as determined by SDS-PAGE analysis.

Endotoxin level

Low endotoxin (<1.0 EU/µg cytokine) as determined by Limulus Amebocyte Lysate (LAL) assay.

Storage

Lyophilized Human IL-2 IS, research grade should be stored at –20 °C. The expiration date is indicated on the vial label. Upon reconstitution aliquots should be stored at –20 °C or below. Avoid repeated freeze-thaw cycles.

Reconstitution

It is recommended to reconstitute lyophilized Human IL-2 IS, research grade with deionized sterile-filtered water to a final concentration of 0.1–1.0 mg/mL in a minimal volume of 100 µL. Further dilutions should be prepared with 0.1% bovine serum albumin (BSA) or human serum albumin (HSA) in phosphate-buffered saline.

1.1 Background information

IL-2, a potent lymphoid cell growth factor, is a typical four α-helix bundle cytokine. It is produced by activated T cells, especially the $CD4^+$ T helper cell population. It plays an important role in both the activation and maintenance of immune responses and in lymphocyte development. IL-2 promotes proliferation and differentiation of T cells, NK cells and B cells and is involved in the elimination of self-reactive T cells. IL-2 signals through a receptor complex consisting of IL-2 receptor α-chain (CD25), β- chain, and common γ-chain. The latter two are also used for IL-15 signaling.

1.2 Applications

Human IL-2 IS can be used for a variety of applications including:

- *In vitro* activation and propagation of T cells, e.g., in combination with the T Cell Activation/Expansion Kit, human.
- *In vitro* stimulation of cytolytic function and expansion of NK cells, e.g., using the NK Cell Activation/Expansion Kit, human.
- Generation of lymphokine-activated killer (LAK) cells or cytokine-induced killer (CIK) cells.

Optimal concentration for a specific application should be determined by a dose-response experiment.

2. References

1. Jamali, A. *et al.* (2020) Highly Efficient Generation of Transgenically Augmented CAR NK Cells Overexpressing CXCR4. Front Immunol 11: 2028.
2. Lissandrello, C. A. *et al.* (2020) High-throughput continuous-flow microfluidic electroporation of mRNA into primary human T cells for applications in cellular therapy manufacturing. Sci Rep 10 (1): 180445.
3. Zanoni, M. *et al.* (2020) Innate, non-cytolytic $CD8^+$ T cell-mediated suppression of HIV replication by MHC-independent inhibition of virus transcription. PLoS Pathog. 16 (9): e1008821.
4. Agarwal, S. *et al.* (2019) In vivo generated human CAR T cells eradicate tumor cells. Oncoimmunology 8 (12): e1671761.
5. Kamei, R. *et al.* (2018) Expression levels of UL16 binding protein 1 and natural killer group 2 member D affect overall survival in patients with gastric cancer following gastrectomy. Oncol Lett. 15 (1): 747–754.
6. Schipp, C. *et al.* (2018) EBV Negative Lymphoma and Autoimmune Lymphoproliferative Syndrome Like Phenotype Extend the Clinical Spectrum of Primary Immunodeficiency Caused by STK4 Deficiency. Front Immunol 9: 2400.
7. Lee, H. J. *et al.* (2017) Expansion of tumor-infiltrating lymphocytes and their potential for application as adoptive cell transfer therapy in human breast cancer. Oncotarget. 8 (69): 113345–113359.
8. Niu, C. *et al.* (2017) Low-dose bortezomib increases the expression of NKG2D and DNAM-1 ligands and enhances induced NK and γδ T cell-mediated lysis in multiple myeloma. Oncotarget. 8 (4): 5954–5964.
9. Müller-Durovic, B. *et al.* (2016) Killer Cell Lectin-like Receptor G1 Inhibits NK Cell Function through Activation of Adenosine 5'-Monophosphate-Activated Protein Kinase. J Immunol 197 (7): 2891–2899.
10. Surenaud, M. *et al.* (2016) Optimization and evaluation of Luminex performance with supernatants of antigen-stimulated peripheral blood mononuclear cells. BMC Immunol. 17 (1): 44.

140-003-712.06

Miltenyi Biotec B.V. & Co. KG
Friedrich-Ebert-Straße 68, 51429 Bergisch Gladbach, Germany
Phone +49 2204 8306-0, Fax +49 2204 85197
macsde@miltenyi.com
www.miltenyibiotec.com

11. Pallett, L. J. *et al.* (2015) Metabolic regulation of hepatitis B immunopathology by myeloid-derived suppressor cells. Nat Med 21 (6): 591–600.
12. Thangamani, S. *et al.* (2015) Cutting edge: progesterone directly upregulates vitamin d receptor gene expression for efficient regulation of T cells by calcitriol. J Immunol 194 (3): 883–886.
13. Colson, P. *et al.* (2014) HIV infection en route to endogenization: two cases. Clin Microbiol Infect 20 (12): 1280–1288.
14. Fuchs, S. *et al.* (2014) Patients with $T^{+/low}$ NK^{+} IL-2 receptor γ chain deficiency have differentially-impaired cytokine signaling resulting in severe combined immunodeficiency. Eur. J. Immunol. 44 (10): 3129–3140.
15. Woods, K. *et al.* (2014) Effects of epithelial to mesenchymal transition on T cell targeting of melanoma cells. Front Oncol 4: 367.
16. Engelmann, S. *et al.* (2013) T cell-independent modulation of experimental autoimmune encephalomyelitis in ADAP-deficient mice. J Immunol 191 (10): 4950–4959.
17. Valignat, M. P. *et al.* (2013) T lymphocytes orient against the direction of fluid flow during LFA-1-mediated migration. Biophys. J. 104 (2): 322–331.
18. Fallarini, S. *et al.* (2012) Invariant NKT cells increase drug-induced osteosarcoma cell death. Br J Pharmakon 167 (7): 1533–1549.
19. Ng, S. B. *et al.* (2011) Dysregulated microRNAs affect pathways and targets of biologic relevance in nasal-type natural killer/T-cell lymphoma. Blood 118 (18): 4919–4929.
20. Nguyen, T. L. *et al.* (2011) Antigen-specific TGF-β-induced regulatory T cells secrete chemokines, regulate T cell trafficking, and suppress ongoing autoimmunity. J Immunol 187 (4): 1745–1753.

Refer to **www.miltenyibiotec.com** for all data sheets and protocols. Miltenyi Biotec provides technical support worldwide. Visit www.miltenyibiotec.com for local Miltenyi Biotec Technical Support contact information.

Legal notices

Limited product warranty

Miltenyi Biotec B.V. & Co. KG and/or its affiliate(s) warrant this product to be free from material defects in workmanship and materials and to conform substantially with Miltenyi Biotec's published specifications for the product at the time of order, under normal use and conditions in accordance with its applicable documentation, for a period beginning on the date of delivery of the product by Miltenyi Biotec or its authorized distributor and ending on the expiration date of the product's applicable shelf life stated on the product label, packaging or documentation (as applicable) or, in the absence thereof, ONE (1) YEAR from date of delivery ("Product Warranty"). Miltenyi Biotec's Product Warranty is provided subject to the warranty terms as set forth in Miltenyi Biotec's General Terms and Conditions for the Sale of Products and Services available on Miltenyi Biotec's website at www.miltenyibiotec.com, as in effect at the time of order ("Product Warranty"). Additional terms may apply. BY USE OF THIS PRODUCT, THE CUSTOMER AGREES TO BE BOUND BY THESE TERMS.

THE CUSTOMER IS SOLELY RESPONSIBLE FOR DETERMINING IF A PRODUCT IS SUITABLE FOR CUSTOMER'S PARTICULAR PURPOSE AND APPLICATION METHODS.

Technical information

The technical information, data, protocols, and other statements provided by Miltenyi Biotec in this document are based on information, tests, or experience which Miltenyi Biotec believes to be reliable, but the accuracy or completeness of such information is not guaranteed. Such technical information and data are intended for persons with knowledge and technical skills sufficient to assess and apply their own informed judgment to the information. Miltenyi Biotec shall not be liable for any technical or editorial errors or omissions contained herein.

All information and specifications are subject to change without prior notice. Please contact Miltenyi Biotec Technical Support or visit www.miltenyibiotec.com for the most up-to-date information on Miltenyi Biotec products.

140-003-712.06

Licenses

This product and/or its use may be covered by one or more pending or issued patents and/or may have certain limitations. Certain uses may be excluded by separate terms and conditions. Please contact your local Miltenyi Biotec representative or visit Miltenyi Biotec's website at www.miltenyibiotec.com for more information.

The purchase of this product conveys to the customer the non-transferable right to use the purchased amount of the product in research conducted by the customer (whether the customer is an academic or for-profit entity). This product may not be further sold. Additional terms and conditions (including the terms of a Limited Use Label License) may apply.

CUSTOMER'S USE OF THIS PRODUCT MAY REQUIRE ADDITIONAL LICENSES DEPENDING ON THE SPECIFIC APPLICATION. THE CUSTOMER IS SOLELY RESPONSIBLE FOR DETERMINING FOR ITSELF WHETHER IT HAS ALL APPROPRIATE LICENSES IN PLACE. Miltenyi Biotec provides no warranty that customer's use of this product does not and will not infringe intellectual property rights owned by a third party. BY USE OF THIS PRODUCT, THE CUSTOMER AGREES TO BE BOUND BY THESE TERMS.

Trademarks

The Miltenyi Biotec logo is a registered trademark or trademark of Miltenyi Biotec B.V. & Co. KG and/or its affiliates in various countries worldwide.