

DESCRIPTION

Source	<i>E. coli</i> -derived human IL-7 protein Asp26-His177, with an N-terminal Met Accession # P13232.1 Produced using non-animal reagents in an animal-free laboratory. Manufactured and tested under cGMP guidelines.
N-terminal Sequence Analysis	Met-Asp26-(Cys)-Asp-Ile-Glu-Gly-Lys-Asp-Gly
Predicted Molecular Mass	17 kDa

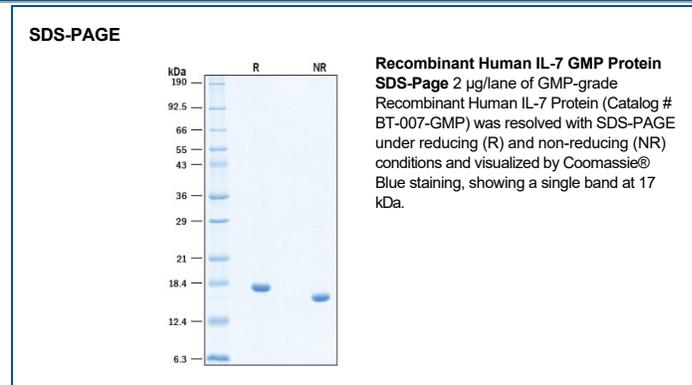
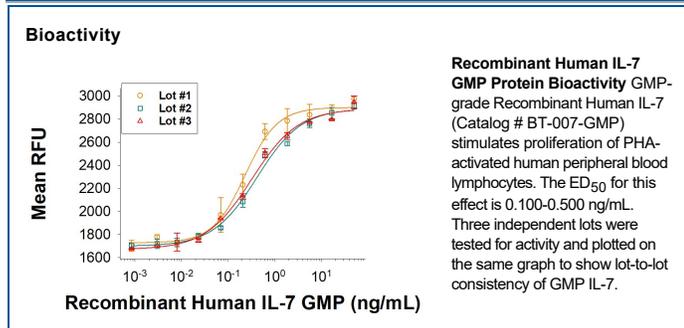
SPECIFICATIONS

SDS-PAGE	17 kDa, under reducing conditions
Activity	Measured in a cell proliferation assay using PHA-activated human peripheral blood lymphocytes (PBL). Yokota, T. <i>et al.</i> (1986) Proc. Natl. Acad. Sci. USA 83 :5894. The ED ₅₀ for this effect is 0.100-0.500 ng/mL. The specific activity of Recombinant Human IL-7 is >1.00 x 10 ⁸ units/mg, which is calibrated against the human IL-7 reference standard (NIBSC code: 90/530).
Endotoxin Level	<0.10 EU per 1 µg of the protein by the LAL method.
Purity	>97%, by SDS-PAGE visualized with Silver Staining and quantitative densitometry by Coomassie® Blue Staining.
Mass Spectrometry	The molecular weight by mass spectrometry is 17507 Da ± 50 Da.
Host Cell Protein	< 0.5 ng per µg of protein when tested by ELISA.
Mycoplasma	Negative when tested in a ribosomal RNA hybridization assay.
Host Cell DNA	< 0.0015 ng per µg of protein when tested by PCR.
Formulation	Lyophilized from a 0.2 µm filtered solution in PBS with Trehalose. See Certificate of Analysis for details.

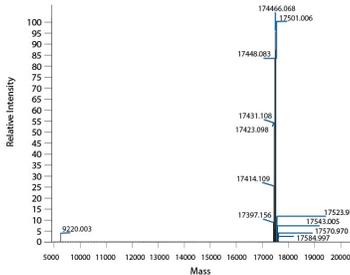
PREPARATION AND STORAGE

Reconstitution	Reconstitute at 100-500 µg/mL in PBS.
Shipping	The product is shipped with polar packs. Upon receipt, store it immediately at the temperature recommended below.
Stability & Storage	Use a manual defrost freezer and avoid repeated freeze-thaw cycles. <ul style="list-style-type: none"> • A minimum of 6 months when stored at ≤ -20 °C as supplied. Refer to lot specific COA for the Use by Date. • 1 month, 2 to 8 °C under sterile conditions after reconstitution. • 3 months, ≤ -20 °C under sterile conditions after reconstitution.

DATA



Mass Spectrometry



Recombinant Human IL-7 GMP Protein Mass Spectrometry
Analysis of GMP-grade Recombinant Human IL-7 (Catalog # BT-007-GMP), showing a major peak at 17501 Da.

BACKGROUND

IL-7 (interleukin-7) is a 25 kDa cytokine of the hemopoietin family that plays important roles in lymphocyte differentiation, proliferation, and survival (1-4). Human IL-7 cDNA encodes 177 amino acids (aa) that include a 25 aa signal peptide (3). Human IL-7 shares approximately 60-63% aa sequence identity with mouse, rat, canine and feline IL-7, and 72-76% with equine, bovine, ovine, porcine, feline and canine IL-7. Human and mouse IL-7 exhibit cross-species activity (2, 3). IL-7 is produced by a wide variety of cells in primary and secondary lymphoid tissues, including stromal epithelial cells of the thymus, bone marrow, and intestines (1, 2, 5). Circulating IL-7 is limiting in healthy animals, but increases during lymphopenia (1, 6). IL-7 signals through a complex of the IL-7 Receptor alpha subunit (IL-7 R α , also known as CD127) with the common γ chain (γ c) (1). The γ c is also a subunit of the receptors for IL-2, -4, -9, -15, and -21 (1). IL-7 R α is expressed on double negative (CD4-CD8-) and CDD4 or CD8 single positive naïve and memory T cells, but undergoes IL-7-mediated down-regulation and shedding during antigen-driven T cell proliferation, and is absent on regulatory T cells (1, 2, 6-11). IL-7 contributes to the maintenance of all naïve and memory T cells, mainly by promoting expression of the anti-apoptotic protein Bcl-2 (9-11). It is required for optimal T cell-dendritic cell interaction (6). IL-7 is expressed early in B cell development prior to the appearance of surface IgM (1, 5, 9). In mouse, IL-7 activation of IL-7 R α is critical for both T cell and B cell lineage development, while in humans, it is required for T cell but not for B cell development (4, 9, 12, 13). However, IL-7 functions in both mouse and human pro-B cells to suppress premature Ig light chain recombination during proliferative growth (14, 15).

References:

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2. Barata, J.T. *et al.* (2006) *Exp. Hematol.* **34**:1133.
3. Goodwin, R.G. *et al.* (1990) *Proc. Natl. Acad. Sci. USA* **86**:302.
4. Namen, A.E. *et al.* (1988) *Nature* **333**:571.
5. Shalapour, S. *et al.* (2012) *PLoS ONE* **7**: e31939.
6. Saini, M. *et al.* (2009) *Blood* **113**:5793.
7. Park, J.H. *et al.* (2004) *Immunity* **21**:289.
8. Vranjkovic, A. *et al.* (2007) *Int. Immunol.* **19**:1329.
9. Sudo, T. *et al.* (1993) *Proc. Natl. Acad. Sci.* **90**:9125.
10. Seddon, B. *et al.* (2003) *Nat. Immunol.* **4**:680.
11. Schluns, K.S. *et al.* (2000) *Nat. Immunol.* **5**:426.
12. Peschon, J.J. *et al.* (1994) *J. Exp. Med.* **180**:1955.
13. Pribyl, J.A. and T.W. LeBien (1996) *Proc. Natl. Acad. Sci.* **93**:10348.
14. Johnson, K. *et al.* (2012) *J. Immunol.* **188**:6084.
15. Nodland, S.E. *et al.* (2011) *Blood* **118**:2116.

MANUFACTURING SPECIFICATIONS

R&D Systems, a Bio-Techne Brand's GMP proteins are produced according to relevant sections of the following documents: WHO TRS, No. 822, 1992 Annex 1, Good Manufacturing Practices for Biological Products; USP Chapter 1043, Ancillary Materials for Cell, Gene and Tissue-Engineered Products and USP Chapter 92, Growth Factors and Cytokines Used in Cell Therapy Manufacturing.

R&D Systems' quality focus includes:

- Manufactured and tested under an ISO 9001:2015 and ISO 13485:2016 certified quality system
- Documented processes and QA control of documentation and process changes
- Personnel training programs
- Raw material testing and vendor qualification/monitoring
- Fully validated equipment, processes and test methods
- Equipment calibration schedules using a computerized calibration program
- Facility maintenance, safety programs and pest control
- Material review process for variances
- Monitoring of stability over product shelf-life

R&D Systems strives to provide our customers with the analytical characteristics of each product so that customers may determine whether our products are appropriate for their research. The Certificate of Analysis provided contains the following lot specific information:

- N-terminal amino acid analysis, SDS-PAGE analysis, and endotoxin level (as determined by LAL assay) performed on each bulk QC lot, not on individual bottlings of each QC lot
- Post-bottling lot-specific bioassay results (compliance with an established range) and results of microbial testing according to USP <71>
- Host Cell Protein testing performed by ELISA
- Mycoplasma testing by ribosomal RNA hybridization assay

Additional testing and documentation requested by the customer can be arranged at an additional cost.

Production records and facilities are available for examination by appropriate personnel on-site at R&D Systems.

R&D Systems sells GMP grade products for preclinical or clinical *ex vivo* cell therapy applications. They are not for *in vivo* use. Please read the following End User Terms prior to using this product.

Animal-Free Manufacturing Conditions

Our dedicated controlled-access animal-free laboratories ensure that at no point in production are the products exposed to potential contamination by animal components or byproducts. Every stage of manufacturing is conducted in compliance with R&D Systems' stringent Standard Operating Procedures (SOPs). Production and purification procedures use equipment and media that are confirmed animal-free.

Production

- All molecular biology procedures use animal-free media and dedicated labware.
- Dedicated fermentors are utilized in committed animal-free areas.

Purification

- Protein purification columns are animal-free.
- Bulk proteins are filtered using animal-free filters.
- Purified proteins are stored in animal-free containers in a dedicated cold storage room.

Quality Assurance

- Low Endotoxin Level.
- No impairment of biological activity.
- High quality product obtained under stringent conditions.

[Please read our complete Animal-Free Statement.](#)