

**DESCRIPTION**

**Source** *E. coli*-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.

**N-terminal Sequence Analysis** Met

**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. *et al.* (1986) Proc. Natl. Acad. Sci. USA **83**:5894.  
The ED<sub>50</sub> for this effect is 0.100-0.500 ng/mL. The specific activity of Recombinant Human IL-7 is >1.00 x 10<sup>8</sup> units/mg, which is calibrated against the human IL-7 reference standard (NIBSC code: 90/530). Specific activity is for reference purposes only and is not routinely tested.

**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.

**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.

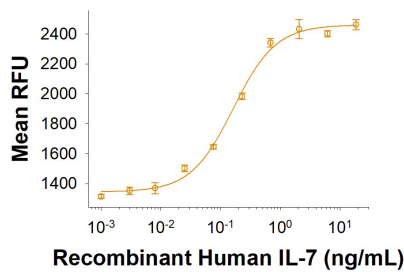
**Shipping** The product is shipped at ambient temperature. Upon receipt, store it immediately at the temperature recommended below.

**Stability & Storage** **Use a manual defrost freezer and avoid repeated freeze-thaw cycles.**

- 12 months from date of receipt, -20 to -70 °C as supplied.
- 1 month, 2 to 8 °C under sterile conditions after reconstitution.
- 3 months, -20 to -70 °C under sterile conditions after reconstitution.

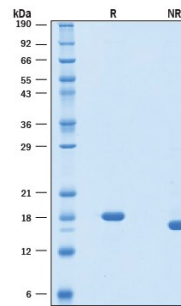
**DATA**

**Bioactivity**



**Recombinant Human IL-7 Protein, Animal-Free Protein Bioactivity.** The bioactivity of Recombinant Human IL-7 Protein, Animal Free (Catalog # BT-007-AFL) stimulates proliferation of PHA-activated human peripheral blood lymphocytes in a dose-dependent manner. The ED<sub>50</sub> for this effect is 0.100-0.500 ng/mL.

**SDS-PAGE**



**Recombinant Human IL-7 Animal-Free Protein SDS-PAGE.** 2 µg/lane of Recombinant Human IL-7 Animal-Free Protein (Catalog # BT-007-AFL) was resolved with SDS-PAGE under reducing (R) and non-reducing (NR) conditions and visualized by Coomassie® Blue staining, showing a single band at 17 kDa.

## 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 $\alpha$ , also known as CD127) with the common  $\gamma$  chain ( $\gamma$ c) (1). The  $\gamma$ c is also a subunit of the receptors for IL-2, -4, -9, -15, and -21 (1). IL-7 R $\alpha$  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 $\alpha$  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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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. Shalpour, 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.
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## MANUFACTURING SPECIFICATIONS

### 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.
- For *ex vivo* research or bioproduction, [additional documentation](#) can be provided.

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