

## DESCRIPTION

**Source** *Spodoptera frugiperda*, Sf9 (baculovirus)-derived human IL-11 protein  
Pro22-Leu199  
Accession # P20809.1  
Produced in an animal component free process (ACFP).  
Manufactured and tested under cGMP guidelines.

**N-terminal Sequence Analysis** Pro-Gly-Pro-Pro-Gly-Pro-Pro-Arg-Val

**Predicted Molecular Mass** 19 kDa

## SPECIFICATIONS

**SDS-PAGE** 20 kDa, reducing conditions

**Activity** Measured in a cell proliferation assay using T11 mouse plasmacytoma cells. Nordan, R.P. *et al.* (1987) J. Immunol. **139**:813.  
The ED<sub>50</sub> for this effect is 0.02-0.12 ng/mL.

The specific activity of recombinant human IL-11 is  $>5.0 \times 10^6$  units/mg, which is calibrated against the human IL-11 WHO Standard (NIBSC code: 92/788).

**Endotoxin Level** <0.10 EU per 1 µg of the protein by the LAL method.

**Purity** >95%, by SDS-PAGE with silver staining, under reducing conditions.

**Mycoplasma** Negative when tested in a ribosomal RNA hybridization assay.

**Formulation** Lyophilized from a 0.2 µm filtered solution in PBS and EDTA. See Certificate of Analysis for details.

## PREPARATION AND STORAGE

**Reconstitution** Reconstitute at 100 µg/mL in PBS.

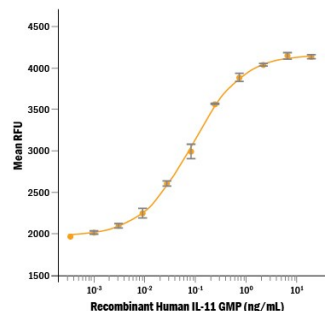
**Shipping** The product is shipped with polar packs. Upon receipt, store it immediately at the temperature recommended below.

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

- A minimum of 6 months when stored at  $\leq -20$  °C as supplied. Refer to lot specific COA for the Use by Date.
- 3 months, 2 to 8 °C under sterile conditions after reconstitution.

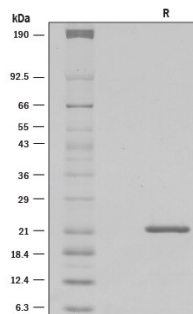
## DATA

### Bioactivity



**Recombinant Human IL-11 GMP Protein Bioactivity** GMP-grade Recombinant Human IL-11 (Catalog # 218-GMP) stimulates cell proliferation of the T11 mouse plasmacytoma cell line. The ED<sub>50</sub> for this effect is 0.02-0.12 ng/mL.

### SDS-PAGE



**Recombinant Human IL-11 GMP Protein SDS-PAGE** 1 µg/lane of Recombinant Human GMP-grade IL-11 was resolved with SDS-PAGE under reducing (R) conditions and visualized by silver staining, showing a single band at 21 kDa.

## BACKGROUND

IL-11 (Interleukin 11) is a pleiotropic cytokine in the IL-6 family, which also includes LIF, CNTF, Oncostatin M, Cardiotrophin-1, IL-27 and IL-31 (1-3). In humans, IL-11 was also independently discovered as an adipogenesis inhibitory factor (AGIF) (3). The human IL-11 cDNA encodes a 199 amino acid (aa) precursor, which generates a 178 aa, 19 kDa mature unglycosylated protein. Mature human IL-11 shares 88%, 88%, and 96% aa sequence identity with mouse, rat and canine IL-11, respectively. IL-11 is secreted by osteoblasts, synoviocytes, fibroblasts, chondrocytes, intestinal myofibroblasts, and trophoblasts, among other cell types (1). It is found in the plasma mainly during inflammation, such as that associated with viral infection, cancer, or inflammatory arthritis, and is considered to be primarily anti-inflammatory (1). It stimulates hematopoiesis and thrombopoiesis, regulates macrophage differentiation, and confers mucosal protection in the intestine (1). It has also been found to enhance T cell polarization toward Th2, promote B cell IgG production, increase osteoclast bone absorption, protect endothelial cells from oxidative stress, and regulate epithelial proliferation and apoptosis (1). IL-11 synergizes with several other cytokines to produce these effects, and its effects overlap with those of IL-6 (1). IL-11 receptor activation requires formation of a complex of two IL-11 molecules with two molecules of the ligand-binding IL-11 R  $\alpha$  subunit and two molecules of the ubiquitously expressed cell signaling  $\beta$  subunit, gp130 (4). A soluble form of IL-11 R  $\alpha$  can bind IL-11 and either form a signaling complex with gp130 on the cell surface, or inhibit cell surface IL-11 R  $\alpha$ /gp130 signaling (5-7).

## References:

1. Putoczki, T. and M. Ernst (2010) J. Leukoc. Biol. **88**:1109.
2. Paul, S.R. *et al.* (1990) Proc. Natl. Acad. Sci. USA **87**:7512.
3. Kawashima, I. *et al.* (1991) FEBS Lett. **283**:199.
4. Barton, V.A. *et al.* (2000) J. Biol. Chem. **275**:36197.
5. Curtis, D.J. *et al.* (1997) Blood **90**:4403.
6. Baumann, H. *et al.* (1996) J. Immunol. **157**:284.
7. Karow, J. *et al.* (1996) Biochem. J. **318**:489.

## MANUFACTURING SPECIFICATIONS

### GMP Proteins

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
- 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 in Minneapolis, Minnesota USA.

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[Please read our complete ACFP Statement](#)

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