

## Recombinant Human IL-1 $\beta$ Protein

### Product Name

Recombinant Human IL-1 $\beta$  Protein

### Size / Catalog Number

100 $\mu$ g / TL513-0100

### Product Information

**Synonyms:** Interleukin-1 $\beta$ , Catabolin, IL1B

**Accession:** UniProt P01584

**Expressed Region:** Ala117-Ser269

**Tag:** C-terminal 6 $\times$ His-tag

**Predicted Expression system:** *E. coli*

**Molecular weight:** 18.6 kDa

**Purity:** > 90% as determined by SDS-PAGE

**Endotoxin:** < 0.1 EU per 1  $\mu$ g of protein (LAL method)

**Activity:** Determined by its ability to induce human NK-92 natural killer lymphoma cells to secrete IFN- $\gamma$ , the corresponding specific activity is  $\geq 1 \times 10^7$  IU/mg.

**Form:** Lyophilized from sterile PBS (pH7.4), typically supplemented with 6% mannitol as a protectant.

### Background

Recombinant human IL-1 $\beta$  protein, a high-purity pro-inflammatory cytokine produced in an *E. coli* expression system and precisely refolded to retain its native bioactivity, exerts a central role in innate immune defense, tissue damage response, and acute-phase reactions by binding to the IL-1RI receptor (signal transduction) and the IL-1RII decoy receptor (negative regulation), thereby activating the NF- $\kappa$ B and MAPK signaling axes and inducing the cascade release of inflammatory mediators such as IL-6 and COX-2; its activity is competitively inhibited by the endogenous IL-1 receptor antagonist (IL-1RA), a regulatory mechanism critically implicated in chronic inflammatory diseases like rheumatoid arthritis and  $\beta$ -cell destruction in diabetes. In cell therapy, IL-1 $\beta$  serves as a key factor for *in vitro* stem cell activation: low-dose pulse stimulation enhances the immunomodulatory function of mesenchymal stem cells (MSCs), promoting their secretion of prostaglandin E2 (PGE2) and hepatocyte growth factor (HGF), thereby optimizing the reparative efficacy of MSC grafts for ischemia-reperfusion injury or fibrotic diseases; simultaneously, in tumor immunotherapy, modulation of the IL-1 $\beta$  signaling pathway can improve the infiltration and persistence of CAR-T cells within the solid tumor microenvironment.

### Stability & Storage

**Lyophilized powder:** Stable for 12 months at -80 $^{\circ}$ C or 6 months at -20 $^{\circ}$ C when stored in the original sealed container under desiccant.

**Reconstitution:** Dissolve in sterile water for injection, 0.9% NaCl, or PBS (pH7.4), maintaining a final concentration  $\geq 100$   $\mu$ g/mL to prevent adsorption.

**Handling:** Aliquot to avoid repeated freeze-thaw cycles.

### References

1. Tabei Y, Nakajima Y. IL-1 $\beta$ -activated PI3K/AKT and MEK/ERK pathways coordinately

promote induction of partial epithelial-mesenchymal transition. *Cell Commun Signal*. 2024 Aug 8;22(1):392.

2. Bent R, Moll L, Grabbe S, *et al*. Interleukin-1 Beta-A Friend or Foe in Malignancies? *Int J Mol Sci*. 2018 Jul 24;19(8):2155.

3. Lopez-Castejon G, Brough D. Understanding the mechanism of IL-1 $\beta$  secretion. *Cytokine Growth Factor Rev*. 2011 Aug;22(4):189-95.

4. Pfeiler S, Winkels H, Kelm M, *et al*. IL-1 family cytokines in cardiovascular disease. *Cytokine*. 2019 Oct;122:154215.

5. Garlanda C, Dinarello CA, Mantovani A. The interleukin-1 family: back to the future. *Immunity*. 2013 Dec 12;39(6):1003-18.

### Intended Use

For research and manufacturing purposes only.