

**Recombinant Human Interleukin-21 (IL-21, with Fc Tag), Animal Component-Free**

<b>Cat. No. :</b>	H020C
<b>Alternative Names:</b>	IL21; IL-21; Interleukin 21; Interleukin-21; Za11
<b>Species:</b>	Human
<b>Accession No.:</b>	Q9HBE4
<b>Expression System:</b>	CHO
<b>Protein Sequence:</b>	His25-Ser162 with a C-terminal linker GGGGG and Human IgG1 (Asp104-Lys330).
<b>Theoretical MW:</b>	41.58 kDa
<b>Theoretical pI:</b>	8.66
<b>Tag:</b>	Fc Tag.
<b>Formulation buffer:</b>	PBS, 5% Mannitol and 0.01% Tween 80, pH7.4.
<b>Appearance:</b>	Lyophilized Powder.
<b>Purity:</b>	≥95% as determined by SDS-PAGE.
<b>Bioactivity:</b>	The ED <sub>50</sub> for enhancing interferon-γ secretion in NK-92 human natural killer lymphoma cells was determined to be ≤20 ng/mL.
<b>Endotoxin Level:</b>	≤0.01 EU/μg, as determined by the LAL assay.
<b>Application:</b>	Cell Culture; Activity Assays.

**Preparation & Storage**

<b>Reconstitution:</b>	Reconstitute with sterile double-distilled water (ddH <sub>2</sub> O). <div style="border: 1px solid orange; padding: 5px; margin-top: 5px;"> <p>⚠ Centrifuge the vial briefly before opening to ensure full recovery of the solution. Avoid vortexing and minimize vigorous pipetting to maintain protein stability.</p> <p>❄ Immediately aliquot the reconstituted protein solution and store under recommended conditions. Avoid repeated freeze-thaw cycles.</p> </div>
<b>Shipping:</b>	Shipped on dry ice. Short-term transit on cold packs (2-8°C) is acceptable.
<b>Storage:</b>	Use a manual defrost freezer and avoid repeated freeze-thaw cycles. <ul style="list-style-type: none"> <li>● 12 months from date of receipt, -20 to -80°C as supplied.</li> <li>● 2-7 days at 2 to 8°C under sterile conditions after reconstitution.</li> <li>● 3-6 months at -20 to -80°C under sterile conditions after reconstitution.</li> </ul>

**Protein Description**

**Background:** Interleukin-21 (IL-21) is a pleiotropic cytokine belonging to the common gamma-chain (γc) family, discovered in 2000 through genomic database mining. The human IL-21 gene is located on chromosome 4q27 and encodes a 155-amino acid protein (17.2 kDa) with a four-helix bundle structure characteristic of γc cytokines. Unlike other family members, IL-21 is predominantly produced by CD4+ T follicular helper (Tfh) cells, Th17 cells, and NKT cells, positioning it as a critical communication molecule between adaptive immune cells.

IL-21 signals through a heterodimeric receptor complex composed of a private IL-21Rα chain and the shared common gamma chain (γc), activating JAK1/JAK3 kinases and downstream STAT1/STAT3/STAT5, PI3K/AKT, and MAPK pathways. This receptor is widely expressed on lymphoid and myeloid cells, enabling IL-21 to exert diverse immunomodulatory effects.

IL-21 plays pivotal roles in adaptive immunity, particularly in germinal center reactions. It drives B cell differentiation into plasma cells, promotes immunoglobulin class-switching, and regulates memory B cell formation. For T cells, IL-21 enhances CD8+ T cell expansion, cytotoxicity, and memory formation while supporting Tfh cell maintenance. It also augments NK cell maturation and cytotoxic function. IL-21 fine-tunes immune responses by simultaneously promoting effector functions while limiting excessive inflammation through regulatory mechanisms.

Clinically, dysregulated IL-21 signaling contributes to autoimmune disorders including systemic lupus erythematosus, rheumatoid arthritis, and type 1 diabetes. It has dual roles in cancer – enhancing anti-tumor immunity through CD8+ T and NK cell activation while potentially supporting tumor growth in certain contexts. Recombinant IL-21 has shown promise in cancer immunotherapy clinical trials, and blocking antibodies against IL-21 or its receptor are being developed for autoimmune conditions. IL-21's ability to enhance CAR-T cell efficacy further highlights its therapeutic relevance in modern immunotherapy approaches.

**References:**

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