Recombinant Human Interleukin-21 (IL-21), Animal Component-Free

Cat. No. :	H019C
Alternative Names:	IL21; IL-21; Interleukin 21; Interleukin-21; Za11
Species:	Human
Accession No.:	Q9HBE4
Expression System:	CHO
Protein Sequence:	His25-Ser162
Theoretical MW:	15.99 kDa
Theoretical pI:	9.51
Tag:	Tag-Free.
Formulation buffer:	PBS, 5% Mannitol and 0.01% Tween 80, pH7.4.
Appearance:	Lyophilized Powder.
Purity:	≥95% as determined by SDS-PAGE.
Bioactivity:	The ED_{50} for enhancing interferon-γ secretion in NK-92 human natural killer lymphoma cells was determined to be ≤20 ng/mL.
Endotoxin Level:	≤0.01 EU/μg, as determined by the LAL assay.
Application:	Cell Culture; Activity Assays.

Preparation & Storage

Reconstitution: Reconstitute with sterile double-distilled water (ddH_2O).

⚠ Centrifuge the vial briefly before opening to ensure full recovery of the solution. Avoid vortexing and minimize vigorous pipetting to maintain protein stability.

❄ Immediately aliquot the reconstituted protein solution and store under recommended conditions. Avoid repeated freeze-thaw cycles.

Shipping: Shipped on dry ice. Short-term transit on cold packs (2-8℃) is acceptable.

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

- 12 months from date of receipt, -20 to -80℃ as supplied.
- 2-7 days at 2 to 8℃ under sterile conditions after reconstitution.
- 3-6 months at -20 to -80℃ under sterile conditions after reconstitution.

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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4. Ozaki K, Kikly K, Michalovich D, Young PR, Leonard WJ. Cloning of a type I cytokine receptor most related to the IL-2 receptor β chain. Proc Natl Acad Sci USA. 2000;97(20):11439-11444.
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Product Disclaimer

- This product is intended for research use only and is not for use in diagnostic, therapeutic, or clinical procedures.
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