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1. Description

Products	Human IL-21, research grade. Recombinant human interleukin 21.						
	<table border="1"> <thead> <tr> <th>Content in µg</th><th>Order no.</th></tr> </thead> <tbody> <tr> <td>10</td><td>130-094-563</td></tr> <tr> <td>25</td><td>130-095-767</td></tr> </tbody> </table>	Content in µg	Order no.	10	130-094-563	25	130-095-767
Content in µg	Order no.						
10	130-094-563						
25	130-095-767						
Biological activity	The ED ₅₀ is ≤100 ng/mL corresponding to an activity of ≥1×10 ⁴ U/mg. ▲ Note: The ED ₅₀ is determined by proliferation assay using mouse B9 hybridoma cells.						
Primary structure	Single, non-glycosylated polypeptide chain (133 amino acid residues).						
Molecular mass	15.5 kDa.						
Source	Produced in <i>E. coli</i> .						
Product format	Lyophilized from a filtered (0.2 µm) buffer solution.						
Stabilizer	Mannitol and trehalose.						
Purity	>97% as determined by SDS-PAGE analysis.						
Endotoxin level	Low endotoxin (<1.0 EU/µg cytokine) as determined by Limulus Amebocyte Lysate (LAL) assay.						
Storage	Lyophilized Human IL-21, research grade should be stored at -20 °C. The expiration date is indicated on the vial label. Upon reconstitution aliquots should be stored at -20 °C or below. Avoid repeated freeze-thaw cycles.						
Reconstitution	It is recommended to reconstitute lyophilized Human IL-21, research grade with deionized sterile-filtered water to a final concentration of 0.1–1.0 mg/mL in a minimal volume of 100 µL. Further dilutions should be prepared with 0.1% bovine serum albumin (BSA) or human serum albumin (HSA) in phosphate-buffered saline.						

1.1 Background information

Interleukin 21 (IL-21) is a four α-helix bundle cytokine and closely related to IL-2, IL-4, and IL-15. IL-21 expression is restricted to activated CD4⁺ T helper cells and NKT cells. Among T helper subsets, IL-21 is strongly produced by follicular T helper cells and T_H17 cells, where IL-21 serves as an autocrine regulator and

seems to sustain T_H17 development. The functional receptor for IL-21, composed of the IL-21 receptor- and the common γ-chain, is expressed on various hematopoietic cells including T, B, NK, and dendritic cells. Accordingly, IL-21 exerts pleiotropic effects on both cellular and humoral immune responses, such as stimulation of lymphocyte proliferation, promotion of CD8⁺ T cell and NK cell cytotoxicity, and differentiation of B cells into plasma cells. Important roles for IL-21 have been proposed with regard to its anti-tumor activity and for the development of autoimmune diseases.

1.2 Applications

Human IL-21 can be used for a variety of applications, including:

- *In vitro* differentiation of naive CD4⁺ T cells towards T_H17 cells and T_{FH}.
- *In vitro* expansion of CD8⁺ T cells and enhancement of cytotoxic T cell function.
- Study of NK cell development and function.
- *In vitro* differentiation of plasma cells from naive B cells.
- Investigation of IL-21-mediated molecular signaling pathways.

Optimal concentration for a specific application should be determined by a dose-response experiment.

2. References

1. Spolski, R. and Leonard, W. J. (2008) Interleukin-21: basic biology and implications for cancer and autoimmunity. *Annu. Rev. Immunol.* 26: 57–79.
2. Fuchs, S. *et al.* (2014) Patients with T^{low} NK⁺ IL-2 receptor γ chain deficiency have differentially-impaired cytokine signaling resulting in severe combined immunodeficiency. *Eur. J. Immunol.* 44 (10): 3129–3140.
3. Jabara, H. H. *et al.* (2012) DOCK8 functions as an adaptor that links TLR-MyD88 signaling to B cell activation. *Nat. Immunol.* 13 (6): 612–620.
4. Nielsen, N. *et al.* (2012) Cytotoxicity of CD56(bright) NK cells towards autologous activated CD4⁺ T cells is mediated through NKG2D, LFA-1 and TRAIL and dampened via CD94/NKG2A. *PLoS One* 7 (2): e31959.

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