

human IL-4, His-tag

Interleukin 4

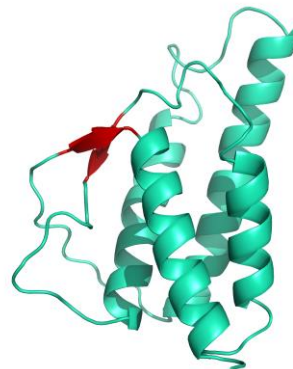
Cat. no. P2020-139

Product Information

Protein:	human IL-4, His-tag (~ 16.8 kDa)
Uniprot#:	P05112
Sequence:	MHKCDITLQEIIKTLNSLTEQKTLCTELTVTDIFAASKNTEKETFCRAATVLRQFYSHH EKDTRCLGATAQQFHRHKQLIRFLKRLDRNLWGLAGLNSCPVKEANQSTLENFLERLKI MREKYSKCSS
	Methionine at pos. 1 might be present due to cloning constraints, C-terminal His-tag not shown in sequence.
Source:	Recombinantly expressed in HEK293 cells.
Tag(s):	His-tag, C-terminal
Purification:	Purified by affinity chromatography and subsequent buffer exchange.
Formulation:	PBS; pH 7.4. Liquid, stored and shipped at -80 °C.
Purity:	> 85 % (will be determined by densitometry of Coomassie stained gel, example next page)
Concentration:	Will be determined by BCA-Assay.
Long-term storage:	No recommendations.
Comment:	Protein migrates at higher molecular weight during SDS-PAGE due to posttranslational modifications.

Background Information:

Interleukin-4 (IL-4) is a member of the type 1 four-alpha-helical cytokine family and exerts its biological functions by binding to one of the two types of IL-4 receptors. The type I receptor is expressed on hematopoietic cells and constitutes a heterodimer composed of the IL-4R alpha and the common gamma chain. In contrast, the type II receptor is expressed on non-hematopoietic cells consisting of IL-4R alpha and IL-13R alpha. IL-4 is predominantly produced by CD4+ T lymphocytes of the Th2 subset as well as activated mast cells, basophils and eosinophils. In response to helminthic infections and allergic reactions, naïve CD4+ T cells become activated and IL-4 stimulates differentiation into Th2 helper cells by activating the transcription factor STAT6. STAT6 in turn, together with T cell receptor (TCR) signals, induces expression of the transcription factor GATA-3, which initiates expression of the characteristic Th2 cytokine genes IL-4, IL-5 and IL-13. This generates a positive feedback loop resulting in enhanced proliferation of Th2 cells. Furthermore, IL-4 fulfills a myriad of cellular effector functions that are crucial for a functional adaptive immune system. In particular, IL-4 promotes B cell



Structural model of human IL-4, His-tag

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Interleukin 4

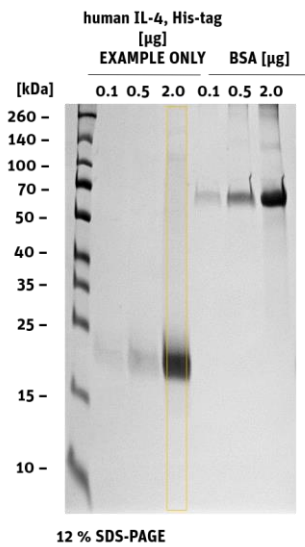
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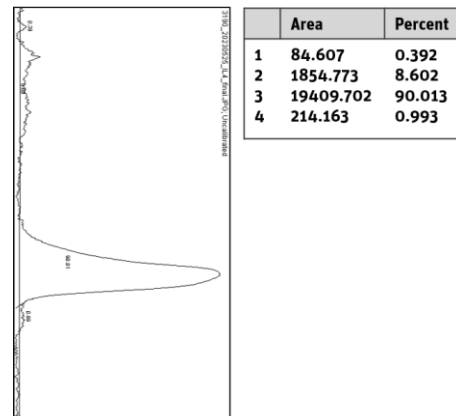
immunoglobulin (Ig) heavy chain class switching to the IgE isotype, which is essentially involved in mediating allergic reactions and eosinophil-mediated defense against helminthic infections. IL-4 is also able to induce Ig heavy chain class switching to the IgG4 isotype in humans and to the IgG1 isotype in mice, respectively. Together with IL-13, IL-4 inhibits classical macrophage activation, which is mediated by IFN- γ . Instead, IL-4 and IL-13 contribute to an alternative macrophage activation into M2 cells resulting in secretion of IL-10 and TGF- β , thereby attenuating pathological inflammation. In addition, M2 cells facilitate wound healing and tissue repair by secretion of cytokines that promote fibroblast proliferation, collagen synthesis, formation of new blood vessels and angiogenesis. Therefore, activation of M2 cells also

plays a critical role in the pathogenesis of atopic dermatitis and severe allergic asthma. IL-4 promotes the recruitment and attachment of leukocytes, especially eosinophils, by stimulating the expression of chemokines and cell adhesion molecules on the endothelium, respectively. This further supports chronic inflammation. Moreover, IL-4 has been shown to be involved in the pathogenesis of various autoimmune diseases, such as rheumatoid arthritis. Thus, it is inevitable to develop effective therapeutic drugs to treat these allergic and chronic inflammatory diseases. The monoclonal antibody dupilumab represents a first-in-class medication approved by the US Food and Drug Administration (FDA), which effectively blocks the IL-4R alpha subunit and thereby the biological effects of IL-4 and IL-13.

Quality Information (provided for each lot):



SDS-PAGE/Coll.Coomassie



Histogram (of marked lane in gel picture)