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Anti-Human IL-4Rα (CD124) (Dupilumab Biosimilar)

Catalog Number:	502101, 502102, 502103
Size:	1 mg, 5 mg, 20 mg
Regulatory Status:	RUO

PRODUCT DETAILS

Clone:	Dupilumab
Application:	Flow cytometry, animal model study
Format:	Liquid
Product Description:	Dupilumab Biosimilar, Human IL4R alpha Monoclonal Antibody
Isotype:	Human IgG4
Clonality:	Recombinant
Immunogen:	Human IL4R alpha
Species specificity:	Human
Purity:	>95% by reducing SDS-PAGE
Grade:	In vivo
Storage Conditions:	4ºC
Maximal Shelf Life:	12 months
Synonyms:	IL-4 receptor alpha

BACKGROUND INFORMATION

Dupilumab is a fully human monoclonal antibody belonging to the immunoglobulin G4 (IgG4) subclass, designed to target the alpha subunit of the interleukin-4 receptor (IL-4Rα). Structurally, it is a glycoprotein composed of two identical heavy chains and two identical light chains connected by interchain disulfide bonds, forming the typical Y-shaped structure characteristic of IgG antibodies, with a molecular weight of approximately 147 kilodaltons (kDa). It is produced in mammalian expression systems, such as Chinese Hamster Ovary (CHO) cells, which allow proper folding, assembly, and glycosylation consistent with human antibody properties.

The variable regions of Dupilumab's heavy (VH) and light (VL) chains contain complementarity-determining regions (CDRs) responsible for binding specifically to human IL-4Rα. This receptor subunit is shared by both the interleukin-4 (IL-4) and interleukin-13 (IL-13) signaling pathways. Through high-affinity, non-covalent interactions involving hydrogen bonding and hydrophobic contacts, Dupilumab binds to IL-4Rα in a manner that sterically blocks the receptor's interaction with both interleukin ligands. This inhibits signaling through the type I receptor complex (IL-4Rα/γc) and the type II receptor complex (IL-4Rα/IL-13Rα1), which are responsible for activating intracellular Janus kinase (JAK) and signal transducer and activator of transcription (STAT) pathways, particularly STAT6. The interruption of these cascades alters gene expression patterns associated with cytokine-mediated immune regulation in experimental systems.

The Fc region of Dupilumab, consistent with IgG4 isotype antibodies, has been engineered with an S228P substitution in the hinge region to enhance structural stability and prevent half-molecule exchange. This IgG4 backbone minimizes effector functions such as antibody-dependent cellular cytotoxicity (ADCC) and complement activation while maintaining extended serum half-life through interaction with the neonatal Fc receptor (FcRn).