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InnoCyto Inc.

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Anti-Human IL-4 Antibody

Catalog Number:	110701
Size:	500 ug
Target Name:	IL-4, Interleukin-4, MCGF-2 (Mast cell growth factor-2), MFF (Macrophage fusion factor), TCGF-2 (T cell gro
Regulatory Status:	RUO

PRODUCT DETAILS

Clone:	MP4-25D2
Application:	Intracellular Flow Cytometry
Reactivity:	Human
Format:	Purified
Isotype:	Rat IgG1
Antibody Type:	Monoclonal
Formulation:	Phosphate-buffered solution, pH 7.2, containing 0.09% sodium azide
Protein Concentration:	0.5 mg/mL
Storage&Handling:	The antibody solution should be stored between 2°C and 8°C
Recommended Usage:	For flow cytometric staining, it is recommended to use less than 0.2 µg of this reagent per 0.5-1.0 million cells in a 100 µL volume. Optimal reagent performance should be determined by titration for each specific application.
Isotype Control:	300101
RRID:	AB_3738950

BACKGROUND INFORMATION

Interleukin-4 (IL-4) is a pleiotropic cytokine that plays a central role in shaping immune responses, particularly those associated with type 2 immunity. It is produced mainly by activated CD4+ T helper 2 (Th2) cells, as well as by mast cells, basophils, eosinophils, and innate lymphoid cells. IL-4 is best known for driving the differentiation of naïve CD4+ T cells into Th2 cells, thereby promoting immune programs involved in defense against helminths and in allergic inflammation.

Structurally, IL-4 is a small, secreted glycoprotein of approximately 15-17 kDa that adopts a compact four–α-helix bundle characteristic of many cytokines in the hematopoietin family. IL-4 signals through a heterodimeric receptor complex composed of the IL-4 receptor alpha chain (IL-4Rα) paired with either the common gamma chain (γc) to form the type I IL-4 receptor, or with IL-13 receptor alpha 1 (IL-13Rα1) to form the type II receptor. Engagement of these receptor complexes initiates intracellular signaling primarily via the JAK-STAT pathway, with STAT6 acting as a key transcriptional mediator.

The functional “ligand” of IL-4 receptors is IL-4 itself, although IL-13 can also signal through the type II IL-4 receptor due to shared receptor subunits and overlapping biological effects. Through receptor engagement, IL-4 influences a wide array of immune cell functions. It stimulates B cell proliferation and promotes immunoglobulin class switching to IgE and IgG1 in mice, enhances

expression of MHC class II and co-stimulatory molecules, and drives alternative (M2) activation of macrophages, which are associated with tissue repair and modulation of inflammation.

IL-4 plays a prominent role in disease, particularly in allergic and atopic conditions such as asthma, allergic rhinitis, and atopic dermatitis. Excessive or dysregulated IL-4 signaling contributes to elevated IgE production, eosinophilic inflammation, and airway hyperresponsiveness. IL-4 is also involved in fibrotic diseases through its effects on macrophages and fibroblasts. In cancer, IL-4-driven macrophage polarization may support tumor growth in certain contexts by promoting immunosuppressive microenvironments.

Therapeutically, IL-4 signaling has become an important target in immune-mediated disease. Biologic agents that block IL-4Rα, thereby inhibiting both IL-4 and IL-13 signaling, have demonstrated significant clinical benefit in allergic and inflammatory disorders. Conversely, controlled manipulation of IL-4 pathways is being explored to enhance tissue repair or modulate immune responses, highlighting IL-4’s dual relevance as both a driver of pathology and a potential therapeutic lever.

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