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InnoCyto Inc.

15375 Barranca Pkwy, Suite I-103
Irvine, CA 92618
Email: info@innocyto.com
Phone: 1-949-418-7543

APC Human CD4 Protein (C-His)

Catalog Number:	810903, 810904
Size:	25 ug, 100 ug
Target Name:	CD4, CD4mut, LEU3
Regulatory Status:	RUO

PRODUCT DETAILS

Application:	Flow Cytometry
Format:	Liquid, APC
Expression Host:	CHO
Species:	Human
Sources:	Recombinant Human CD4 Protein (Lys26-Trp390) with C-terminus His-tag is expressed in CHO cell and conjugated to APC.
Accession Number:	P01730
Molecular Weight:	The protein has a predicted molecular weight of 42.3 kDa. Under DTT-reducing conditions, it migrates at approximately 55 kDa on SDS-PAGE prior to conjugation.
Affinity Tag:	C-His
Formulation:	1xPBS buffer, pH7.4, 0.09% NaN3 with a carrier protein
Endotoxin level:	Not tested
Protein Concentration:	25µg size is bottled at 0.1mg/mL concentration. 100 µg size is bottled at lot specific concentration.
Storage and Handling:	Briefly centrifuge the vial upon receipt. An unopened vial may be stored at 2–8°C for up to six months.

BACKGROUND INFORMATION

CD4 is a cell surface glycoprotein best known for its essential role in adaptive immunity. It is primarily expressed on helper T lymphocytes ($CD4^+$ T cells), as well as on subsets of dendritic cells, macrophages, and monocytes. CD4 functions as a co-receptor for the T cell receptor (TCR), enhancing antigen recognition and signal transduction during immune activation. Through its central role in coordinating immune responses, $CD4^+$ T cells help regulate both cellular and humoral immunity.

The primary ligand for CD4 is the major histocompatibility complex class II (MHC II), which is expressed on professional antigen-presenting cells such as dendritic cells, B cells, and macrophages. During antigen presentation, CD4 binds to a conserved region of MHC II while the TCR recognizes the antigenic peptide. This interaction stabilizes the immunological synapse and recruits the Src-family kinase Lck to the TCR complex, amplifying downstream signaling. Through this mechanism, CD4 lowers the threshold for T cell activation and promotes effective immune responses. CD4 can also interact with other ligands, most notably the HIV envelope glycoprotein gp120, which exploits CD4 as a receptor for viral entry.

$CD4^+$ T cells differentiate into multiple functional subsets, including Th1, Th2, Th17, T follicular helper (Tfh), and regulatory T cells (Tregs). Each subset produces distinct cytokines and performs specialized functions, ranging from activation of macrophages and cytotoxic T cells to support of antibody production and maintenance of immune tolerance. Proper balance among these subsets is critical for immune homeostasis.

Dysregulation or loss of $CD4^+$ T cells is associated with a wide range of diseases. The most well-known example is HIV infection, in which viral-mediated depletion of $CD4^+$ T cells leads to progressive immunodeficiency and increased susceptibility to opportunistic infections. Abnormal $CD4^+$ T cell responses also contribute to autoimmune diseases such as multiple sclerosis, rheumatoid arthritis, and inflammatory bowel disease, as well as allergic and chronic inflammatory conditions.

CD4 plays an important role in therapeutics both as a biomarker and a direct target. $CD4^+$ T cell counts are routinely used to monitor immune status in HIV patients. Therapeutic strategies aimed at modulating $CD4^+$ T cell function-such as immune checkpoint inhibitors, cytokine-targeting biologics, and tolerogenic therapies-are widely used in cancer, autoimmunity, and transplantation. Additionally, CD4 is a key consideration in vaccine design, as effective and durable immune responses depend on robust $CD4^+$ T cell help.

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