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APC Human CD7 Protein (C-His)

Catalog Number:	805603, 805604
Size:	25 ug, 100 ug
Target Name:	CD7, GP40, TP41, LEU-9, Tp40
Regulatory Status:	RUO

PRODUCT DETAILS

Application:	Flow Cytometry
Format:	Liquid, APC
Expression Host:	CHO
Species:	Human
Sources:	Recombinant Human CD7 (Ala26-Pro180) with C-terminus His tag is expressed in CHO cell and conjugated to APC.
Accession Number:	P09564
Molecular Weight:	The protein has a predicted molecular weight of 16 kDa. Under DTT-reducing conditions, it migrates at approximately 30-40 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

CD7 is a transmembrane glycoprotein belonging to the immunoglobulin superfamily that serves as an important marker of T cell and natural killer (NK) cell lineages. It is one of the earliest surface antigens expressed during T cell development, appearing on thymocytes and persisting throughout T cell maturation. CD7 plays a costimulatory role in T cell activation and is involved in regulating immune responses. The protein participates in T cell receptor signaling, cell-cell interactions, and may contribute to immune synapse formation and lymphocyte trafficking, though its complete physiological functions continue to be investigated.

Structurally, CD7 is a type I transmembrane protein of approximately 40 kDa consisting of a single extracellular immunoglobulin-like domain, a transmembrane region, and a cytoplasmic tail. The extracellular domain contains the characteristic features of the immunoglobulin superfamily, including disulfide bonds that stabilize its three-dimensional structure. The cytoplasmic domain is relatively short but contains motifs that can interact with intracellular signaling molecules and cytoskeletal components. CD7 can form homodimers on the cell surface, and this oligomerization may be important for its signaling and costimulatory

functions.

The primary identified ligand for CD7 is K12/SECTM1 (secreted and transmembrane 1), which binds to CD7 and mediates costimulatory signals during T cell activation. Upon binding to K12/SECTM1, CD7 triggers the production of cytokines and enhances T cell responses. Additionally, CD7 may engage in homophilic interactions (CD7-CD7 binding between cells) and has been reported to interact with galectin-1, a lectin involved in immune regulation. The protein's glycosylation patterns influence its binding properties and functional activities in the immune system.

In disease contexts, CD7 expression patterns are clinically significant in hematologic malignancies. CD7 is expressed on most T cell acute lymphoblastic leukemias (T-ALL) and certain peripheral T cell lymphomas, making it a valuable diagnostic marker. CD7-positive acute myeloid leukemia (AML) represents a subset with distinct clinical features and often poorer prognosis. Therapeutically, CD7 has emerged as a promising target for immunotherapy in T cell malignancies. CD7-directed chimeric antigen receptor (CAR) T cell therapies are under active development and clinical investigation for treating T-ALL and peripheral T cell lymphomas. However, targeting CD7 presents unique challenges because normal T cells also express this marker, requiring innovative strategies such as CD7 knockout in CAR-T cells to prevent fratricide (self-destruction). K12/SECTM1-based CAR T cells that exploit the natural CD7-K12 interaction are being developed to enhance specificity and efficacy while minimizing toxicity to normal T cells.