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InnoCyto Inc.

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

# Recombinant Human CD3D & CD3E Heterodimer Protein (ECD, Flag &

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| **Catalog Number:** | 632801, 632802 |
| **Size:** | 50 μg, 500 μg |
| **Target Name:** | CD3e, CD3d |
| **Regulatory Status:** | RUO |

## PRODUCT DETAILS

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| **Application:** | Bioassay |
| **Format:** | Lyophilized from sterile PBS, pH7.4. |
| **Expression Host:** | HEK293 |
| **Species:** | Human |
| **accession number:** | P04234-1 & P07766-1 |
| **Sources:** | A DNA sequence encoding the extracellular domain (Met1-Ala105) of human CD3D (P04234-1) was fused with a flag tag at the C-terminus, constructed the plasmid 1; A DNA sequence encoding the extracellular domain (Met1-Asp126) of human CD3E (P07766-1) was fused with a polyhistidine tag at the C-terminus, constructed the plasmid 2. The two plasmids were co-expressed and the human CD3D/CD3E heterodimer was purified. |
| **Molecular Weight:** | The recombinant heterodimer of human CD3D&CD3E comprises 271 (126+145) amino acids and has a calculated molecular mass of 31.05 (14.4+16.65)KDa. As a result of glycosylation, the apparent molecular mass of human CD3D&CD3E heterodimer is approximately 20, 22 and 26 KDa in SDS-PAGE under reducing conditions. The molecular weight of this protein is around 45.4 KDa verified by SEC-MALS(Routinely tested). |
| **Affinity Tag:** | C-FLAG & C-His |
| **Purity:** | ≥95% as determined by SDS-PAGE. ≥95% as determined by SEC-HPLC. ≥95% as determined by SEC-MALS (Routinely tested). |
| **Endotoxin level:** | < 1.0 EU per μg protein |
| **Protein Concentration:** | Lyophilized |
| **Storage and Handling:** | Samples are stable for up to twelve months from date of receipt at -20℃ to -80℃. Store it under sterile conditions at -20℃ to -80℃. It is recommended that the protein be aliquoted for optimal storage. Avoid repeated freeze-thaw cycles. |

## BACKGROUND INFORMATION

CD3e and CD3d are two transmembrane components of the CD3 complex, a critical part of the T-cell receptor (TCR) signaling machinery. The CD3e/CD3d heterodimer associates with the TCRαβ or TCRγδ chains and helps transmit signals generated when the TCR recognizes antigen. Unlike the TCR chains, which provide antigen-recognition specificity, CD3 proteins contain intracellular signaling motifs that initiate downstream T-cell activation, differentiation, proliferation, and cytokine production.

Structurally, CD3e and CD3d are type I transmembrane glycoproteins with extracellular immunoglobulin-like domains, single-pass transmembrane regions, and cytoplasmic tails containing immunoreceptor tyrosine-based activation motifs (ITAMs). The CD3e/CD3d heterodimer forms one of the signaling modules within the multisubunit TCR-CD3 complex. CD3e and CD3d do not function as conventional ligand-binding receptors; instead, their extracellular regions contribute to assembly and stability of the TCR-CD3 complex, while their cytoplasmic signaling motifs interact with intracellular kinases.

The principal ligand for the overall TCR-CD3 complex is peptide–MHC (pMHC), rather than a ligand that binds specifically to CD3e/CD3d. Engagement of the TCR by antigen–MHC triggers phosphorylation of CD3 ITAMs and activation of signaling pathways involving ZAP-70, LAT, and downstream transcription factors. Abnormal TCR-CD3 signaling can contribute to autoimmune diseases, inflammatory disorders, immunodeficiency, and T-cell malignancies.

Because CD3 is expressed broadly on mature T cells, it is an important therapeutic target. Anti-CD3 antibodies can modulate or deplete T-cell populations and have been investigated for autoimmune diseases and transplantation. CD3-binding domains are also incorporated into bispecific T-cell engagers (T-cell engagers), which redirect T cells toward tumor cells. Consequently, CD3e/CD3d-containing complexes are important targets and reagents for studying T-cell biology, immunotherapy, and immune-mediated disease.

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