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CTLA-4 Fc Fusion Protein (Belatacept Biosimilar)

Catalog Number: 500801, 500802, 500803

Size: 1 mg, 5 mg, 20 mg

Regulatory Status: RUO

PRODUCT DETAILS

Clone: Belatacep

Application: Flow cytometry, animal model study

Format: Liquid

Product Description: CTLA-4 Fc Fusion Protein (Belatacept Biosimilar)

Isotype: Human IgG1

Clonality: Recombinant

Species specificity: Human

Purity: >95% by reducing SDS-PAGE

Grade: In vivo

Storage Conditions: 4ºC

Maximal Shelf Life: 12 months

Synonyms: CD152

BACKGROUND INFORMATION

Belatacept is a recombinant fusion protein designed to modulate T-cell activation through selective interference with costimulatory signaling. Structurally, it combines the extracellular domain of cytotoxic T-lymphocyte-associated antigen 4 (CTLA-4, also known as CD152) with the Fc (fragment crystallizable) region of human immunoglobulin G1 (IgG1). This molecular architecture creates a chimeric protein with high affinity and stability, mimicking natural receptor interactions while maintaining the durability of an antibody framework. The molecule has a molecular mass of approximately 92 kilodaltons (kDa) and is produced using recombinant DNA technology in mammalian expression systems, such as Chinese Hamster Ovary (CHO) cells, to ensure proper folding, disulfide bond formation, and glycosylation characteristic of human proteins.

The functional core of Belatacept resides in its CTLA-4 domain, which binds specifically to the costimulatory ligands CD80 (B7-1) and CD86 (B7-2) expressed on antigen-presenting cells (APCs). These ligands normally interact with the CD28 receptor on T cells to deliver the second signal required for full T-cell activation, following antigen recognition. By binding to CD80 and CD86 with high affinity, Belatacept blocks their interaction with CD28, effectively preventing the costimulatory signal and leading to inhibition of T-cell activation, proliferation, and cytokine production. This mechanism allows fine control of immune cell signaling without direct cytotoxicity.

The Fc region of Belatacept, derived from human IgG1, confers structural stability, facilitates dimerization via interchain disulfide bonds, and contributes to a prolonged half-life through interaction with the neonatal Fc receptor (FcRn), which protects the

molecule from lysosomal degradation. Importantly, the IgG1 Fc segment in Belatacept is engineered to minimize effector functions such as complement activation and antibody-dependent cellular cytotoxicity. Overall, Belatacept exemplifies rational protein engineering, combining receptor-mimicking precision with antibody-derived pharmacokinetic efficiency to enable controlled modulation of T-cell costimulatory pathways in immunological research.