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Anti-Human PD1 (Pembrolizumab Biosimilar)

Catalog Number:	504701, 504702, 504703
Size:	1 mg, 5 mg, 20 mg
Target Name:	PD1, PD-1, PDCD1, CD279, SLEB2
Regulatory Status:	RUO

PRODUCT DETAILS

Clone:	Pembrolizumab
Application:	Flow cytometry, animal model study
Reactivity:	Human
Format:	Liquid
Product Description:	Anti-Human PD-1 (Pembrolizumab Biosimilar)
Isotype:	Human IgG4
Clonality:	Recombinant
Immunogen:	Human PD1
Species specificity:	Human
Purity:	>95% by reducing SDS-PAGE
Grade:	In vivo
Storage Conditions:	4ºC
Maximal Shelf Life:	12 months
Synonyms:	CD279
RRID:	AB_3739323
Antibody Type:	Recombinant
Reactivity:	Human

BACKGROUND INFORMATION

Pembrolizumab is a fully humanized monoclonal antibody of the immunoglobulin G4 kappa (IgG4κ) subclass engineered to specifically bind to the programmed death-1 (PD-1, also known as CD279) receptor expressed on activated T cells. Structurally, Pembrolizumab is a glycoprotein with a molecular weight of approximately 149 kilodaltons (kDa). The molecule consists of two identical heavy chains and two identical light chains joined by disulfide bonds, forming the characteristic Y-shaped architecture typical of immunoglobulins. Each heavy chain is composed of one variable (VH) and three constant (CH1-CH3) domains, while each light chain contains one variable (VL) and one constant (CL) domain. It is produced in mammalian expression systems, such as Chinese Hamster Ovary (CHO) cells, to ensure correct folding, glycosylation, and molecular stability.

The variable domains of Pembrolizumab contain complementarity-determining regions (CDRs) that form the antigen-binding sites responsible for recognizing a specific epitope on the PD-1 receptor. These CDRs establish high-affinity, non-covalent interactions with the extracellular domain of PD-1. By occupying the ligand-binding region of PD-1, Pembrolizumab effectively blocks its interaction with programmed death-ligand 1 (PD-L1) and programmed death-ligand 2 (PD-L2). This blockade inhibits the intracellular signaling cascade initiated by PD-1 engagement, which normally leads to suppression of T-cell activation, cytokine production, and proliferation. In experimental systems, this results in enhanced T-cell signaling and immune response regulation.

The Fc (fragment crystallizable) region of Pembrolizumab is derived from the IgG4 isotype and includes an engineered S228P mutation in the hinge region to improve structural integrity by preventing half-antibody exchange. The IgG4 Fc configuration minimizes binding to Fc gamma receptors (FcγRs) and complement component C1q, thus greatly reducing antibody-dependent and complement-mediated cytotoxicity. Overall, Pembrolizumab exemplifies advanced antibody engineering, combining high receptor specificity, precise inhibitory activity, and optimized molecular stability for studies of immune checkpoint regulation and T-cell receptor–ligand dynamics.

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