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Anti-Human PD1 (Nivolumab Biosimilar)

Catalog Number:	504201, 504202, 504203
Size:	1 mg, 5 mg, 20 mg
Target Name:	PD1, PD-1, PDCD1, CD279, SLEB2
Regulatory Status:	RUO

PRODUCT DETAILS

Clone:	Nivolumab
Application:	Flow cytometry, animal model study
Reactivity:	Human
Format:	Liquid
Product Description:	Anti-Human PD-1 (Nivolumab Biosimilar)
Isotype:	Human IgG4
Clonality:	Recombinant
Immunogen:	Recombinant human PD-1-Fc protein
Clone Number:	5C4.B8
Species specificity:	Human
Purity:	>95% by reducing SDS-PAGE
Grade:	In vivo
Storage Conditions:	4ºC
Maximal Shelf Life:	12 months
Synonyms:	CD279
Antibody Type:	Recombinant
Reactivity:	Human

BACKGROUND INFORMATION

Nivolumab is a fully human immunoglobulin G4 kappa (IgG4κ) monoclonal antibody engineered to target programmed death-1 (PD-1), an immune checkpoint receptor expressed on activated T cells. Structurally, it has a molecular weight of approximately 146 kilodaltons (kDa) and comprises two identical heavy chains and two identical light chains connected by interchain disulfide bonds, forming the canonical Y-shaped structure of IgG molecules. The antibody is produced in mammalian expression systems, such as Chinese Hamster Ovary (CHO) cells, ensuring correct folding, assembly, and glycosylation that conform to native human immunoglobulin characteristics. To improve structural integrity, the IgG4 Fc region incorporates a stabilizing S228P hinge mutation that prevents half-antibody exchange, a property commonly optimized in therapeutic IgG4 frameworks.

The variable regions of Nivolumab's heavy (VH) and light (VL) chains contain complementarity-determining regions (CDRs) that form the high-affinity antigen-binding site. These CDRs mediate specific recognition of an extracellular epitope on the PD-1 receptor through a combination of hydrogen bonding and hydrophobic interactions, exhibiting binding affinities in the nanomolar range. By occupying this epitope, Nivolumab blocks the interaction between PD-1 and its ligands, programmed death-ligand 1 (PD-L1) and programmed death-ligand 2 (PD-L2), effectively interrupting the inhibitory signaling cascade that downregulates T-cell activation. In experimental systems, this blockade restores intracellular signaling involving ZAP-70 and PI3K, enhancing T-cell receptor–mediated activation and cytokine production.

The Fc (fragment crystallizable) region of Nivolumab confers structural stability, extended serum half-life, and reduced immune effector activity. The IgG4 isotype displays low affinity for Fc gamma receptors (FcγRs) and complement component C1q, minimizing antibody-dependent cellular cytotoxicity (ADCC) and complement-dependent cytotoxicity (CDC). Interaction with the neonatal Fc receptor (FcRn) contributes to molecular recycling and sustained systemic persistence.

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