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Trastuzumab Biosimilar, N297A Mutant

Catalog Number: 506301
Size: 1 mg
Regulatory Status: RUO

PRODUCT DETAILS

Clone: Trastuzumab
Application: Flow cytometry, animal model study
Format: Liquid
Product Description: Trastuzumab Biosimilar, N297A Mutant
Isotype: Human IgG1, N297A
Clonality: Recombinant
Immunogen: A431 cells overexpressing human EGFR
Clone Number: 4D5-8
Species specificity: Human
Purity: >95% by reducing SDS-PAGE
Grade: In vivo
Storage Conditions: 4ºC
Maximal Shelf Life: 12 months
Synonyms: CD340, HER2

BACKGROUND INFORMATION

Trastuzumab is a recombinant humanized monoclonal antibody belonging to the immunoglobulin G1 (IgG1) subclass, engineered to specifically recognize the human epidermal growth factor receptor 2 (HER2, also known as ErbB2). Structurally, the molecule has a molecular weight of approximately 148 kilodaltons (kDa) and retains the typical Y-shaped configuration of IgG antibodies, consisting of two identical heavy chains and two identical light chains connected by disulfide bonds. Each heavy chain contains one variable (VH) domain and three constant (CH1-CH3) domains, while each light chain comprises one variable (VL) and one constant (CL) domain. Trastuzumab is produced in mammalian expression systems, such as Chinese Hamster Ovary (CHO) cells, ensuring proper glycosylation and structural fidelity.

The antigen-binding sites of Trastuzumab, located within the complementarity-determining regions (CDRs) of its VH and VL domains, exhibit high specificity for an extracellular epitope on subdomain IV of the HER2 receptor. The binding interaction is stabilized by a network of hydrogen bonds and hydrophobic contacts, characterized by sub-nanomolar affinity. This precise molecular recognition prevents receptor interactions that influence downstream signaling, thus modulating various intracellular signaling cascades involved in cell proliferation and survival within experimental systems that model receptor-mediated signaling pathways.

The N297A mutant is engineered where the asparagine at position 297 is replaced with alanine, preventing glycosylation in the CH2 domain of the Fc region. This modification eliminates binding to Fc receptors (FcgammaR) and C1q, resulting in "silent" or non-effector antibodies that lack antibody-dependent cellular cytotoxicity (ADCC) and complement-dependent cytotoxicity (CDC).