Product Data Sheet

Product Name: Omalizumab
Cat. No.: GC18662

Chemical Properties

Cas. No.	242138-07-4		
Formula	$C_{6450}H_{9916}N_{1714}O_{2023}S_{38}$	M.Wt	145056.09
Solubility		Storage	Store at -80°C
General tips	For obtaining a higher solubility , please warm the tube at 37 ℃ and shake it in the ultrasonic bath for a while.Stock solution can be stored below -20℃ for several months.		
Shipping Condition	Evaluation sample solution : ship with blue ice All other available size: ship with RT , or blue ice upon request.		
Structure	Omalizumab		

Protocol

Cell experiment [1]:

Cell lines	LAD2 cells
Preparation Method	LAD2 cells were sensitized overnight with IgEB (100 ng/mL) in culture media. The following day, the cells were washed three times in Tyrode’s buffer to eliminate unbound IgE, were subsequently incubated with Omalizumab or hIgG at different concentrations (high-dose experiments: 2, 1, 0.5, and 0.25mg/mL; or low-dose experiments: 300, 100 and 30μg/mL) in culture media and for different periods of time (30min, 3h, 24h), and were then stimulated with streptavidin for varying periods of time. Supernatants were collected for CysLT measurement, and the cells were used for WB analysis or FACS staining.

Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com
Address: 10292 Central Ave. #205, Montclair, CA, USA

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Reaction Conditions	0.25, 0.5, 1, 2mg/mL or 30, 100, 300μg/mL; 30min, 3h, 24h
Applications	Omalizumab dissociates pre-bound IgE from mast cells, resulting in a reduction of proximal phosphorylation-mediated signalling events (Syk, PLCγ, and LAT) and in a decrease in degranulation and leukotriene synthesis.

Animal experiment [2]:

Animal models	Cynomolgus monkeys
Preparation Method	3-7 years old male cynomolgus monkeys weighing between 3 and 7 kg were used. To develop the allergic asthma models, monkeys were sensitized with dinitrophenyl-Ascaris suum (DNP-As) allergen. After modeling, monkeys received a dose of 10mg/kg test antibody (AB1904Am15) once a week via subcutaneous administration for 3 weeks. Humanized IgG1 antibody was used as isotype control. Omalizumab was used as a positive control. Airway resistance (RL) and lung dynamic compliance (Cdyn) were measured at 24h post 1st and 3rd dosing.
Dosage form	10mg/kg; 3 weeks; s.c.
Applications	Monkeys treated with AB1904Am15 or Omalizumab showed significant decreases in RL and Cdyn at 24 hours after the first and third doses, compared to the isotype control group.

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References:
[1] Serrano-Candelas E, Martinez-Aranguren R, Valero A, et al. Comparable actions of omalizumab on mast cells and basophils[J]. Clinical & Experimental Allergy, 2016, 46(1): 92-102.
[2]Liu P, Pan Z, Gu C, et al. An omalizumab biobetter antibody with improved stability and efficacy for the treatment of allergic diseases[J]. Frontiers in immunology, 2020, 11: 596908.

Background

Omalizumab is a recombinant humanized monoclonal antibody against human immunoglobulin E (IgE) with a K_D value of 0.393nM[1]. Omalizumab is a human IgG1 kappa antibody that binds with high specificity to free IgE, which is widely present in human blood and tissue fluid[2]. Omalizumab inhibits the binding of IgE to FcεRI on mast cells and basophils by binding to an antigenic epitope on IgE that overlaps with the binding site of FcεRI[3]. Omalizumab can be used to treat severe persistent allergic

asthma, nasal polyps, urticaria, and IgE-mediated food allergies[4, 5].

In vitro, treatment of human mast cell line (LAD2 cells) and basophils with Omalizumab (30, 100, 300μg/mL) for 24h promoted the dissociation of IgE bound to the surface of mast cells and basophils, inhibited key signaling events mediated by proximal phosphorylation (such as activation of Syk, PLCγ, and LAT), and reduced cell degranulation and leukotriene synthesis[6].

In vivo, subcutaneous treatment of an asthmatic model of cynomolgus monkeys with Omalizumab (10mg/kg) for 3 weeks significantly reduced airway resistance (RL) and lung dynamic compliance (Cdyn)[7].

References:
[1] Chu S Y, Horton H M, Pong E, et al. Reduction of total IgE by targeted coengagement of IgE B-cell receptor and FcγRIIb with Fc-engineered antibody[J]. Journal of allergy and clinical immunology, 2012, 129(4): 1102-1115.
[2] Lyly A, Laulajainen-Hongisto A, Gevaert P, et al. Monoclonal antibodies and airway diseases[J]. International Journal of Molecular Sciences, 2020, 21(24): 9477.
[3] Gomez G. Current strategies to inhibit high affinity FcεRI-mediated signaling for the treatment of allergic disease[J]. Frontiers in immunology, 2019, 10: 175.
[4] McCormack P L. Omalizumab: a review of its use in patients with chronic spontaneous urticaria[J]. Drugs, 2014, 74(14): 1693-1699.
[5] Wood R A, Togias A, Sicherer S H, et al. Omalizumab for the treatment of multiple food allergies[J]. New England Journal of Medicine, 2024, 390(10): 889-899.
[6] Serrano-Candelas E, Martinez-Aranguren R, Valero A, et al. Comparable actions of omalizumab on mast cells and basophils[J]. Clinical & Experimental Allergy, 2016, 46(1): 92-102.
[7] Liu P, Pan Z, Gu C, et al. An omalizumab biobetter antibody with improved stability and efficacy for the treatment of allergic diseases[J]. Frontiers in immunology, 2020, 11: 596908.

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