Product Data Sheet

Product Name: Benralizumab
Cat. No.: GC39346

Chemical Properties

Cas. No.	1044511-01-4		
SMILES	[Benralizumab]		
Formula		M.Wt	
Solubility	Soluble in DMSO	Storage	Store at 4°C, do not freeze
General tips	For obtaining a higher solubility , please warm the tube at 37 °C and shake it in the ultrasonic bath for a while.Stock solution can be stored below -20°C 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			

Benralizumab

Protocol

Cell experiment [1]:

Cell lines	Peripheral blood-derived eosinophils

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Preparation Method	5×10^4 NK cells and 10^4 eosinophils were co-cultured with different dilutions of Benralizumab (0.00001, 0.0001, 0.001, 0.01, 0.1, and 1nM) or the parental αIL-5Rα monoclonal antibody in a 96-well flat-bottom plate for 22 hours. The assay was terminated by placing the culture plate on ice and replacing the medium with PBS/BSA (in which Annexin V Alexa 647 was added at a 1:500 dilution). Subsequently, the survival of eosinophils was detected.
Reaction Conditions	0.00001, 0.0001, 0.001, 0.01, 0.1, and 1nM; 22h
Applications	Benralizumab treatment significantly induced cell death of eosinophils in a dose-dependent manner.

Animal experiment [2]:

Animal models	hIL-3/hGM-CSF/hIL-5 Tg NOD/Shi-scid-IL2rγ^{null} (NOG) mice
Preparation Method	hIL-3/hGM-CSF/hIL-5 Tg NOD/Shi-scid-IL2rγ^{null} (NOG) mice were maintained under a 12h light and 12h dark cycle at a temperature of 25°C and humidity of 50%±10%, free with water and diet. Mice were intraperitoneally (i.p.) injected with Benralizumab (10mg/kg) or hIgG1 on days 0, 14, and 28. Collect peripheral blood and lung tissue of mice for analysis.
Dosage form	10mg/kg; every 2 weeks for 4 weeks; i.p.
Applications	Benralizumab treatment reduced the levels of IL4 and IL13 in the peripheral blood and lung tissues of mice.

Caution: Product has not been fully validated for medical applications. For research use only.
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References:
[1] Kolbeck R, Kozhich A, Koike M, et al. MEDI-563, a humanized anti–IL-5 receptor α mAb with enhanced antibody-dependent cell-mediated cytotoxicity function[J]. Journal of Allergy and Clinical Immunology, 2010, 125(6): 1344-1353. e2.
[2] Nunomura S, Ito R, Nanri Y, et al. Novel mechanisms by which benralizumab suppresses IgE expression in human B cells in humanized mice[J]. Allergy, 2023, 78(12).

Background

Benralizumab is a humanized, afucosylated, anti-interleukin-5 receptor α monoclonal antibody that induces direct, rapid, and nearly complete depletion of eosinophils [1]. Benralizumab can selectively bind to the isoleucine-61 amino acid residue in domain 1 of IL-5Rα, hindering the binding of IL-5 to the related receptor and the subsequent heterodimerization of the α and βc subunits, thereby preventing the activation of the complex signaling pathways associated with IL-5 receptor activation [2]. Benralizumab has been widely used to enhance the activity of natural killer (NK) cells and increase the levels of pro-apoptotic proteins perforin and granzyme B[3].

In vitro, Benralizumab treatment for 22h significantly induced the death of eosinophils or basophils, with EC_{50} values of 0.9pM and 0.5pM, respectively [4]. Treatment with 5μM Benralizumab for 3 days significantly inhibited the proliferation of HL-60 cells and induced cell cycle arrest, accompanied by a decrease in STAT3 protein levels[5].

In vivo, Benralizumab treatment via intraperitoneal injection at a dose of 10mg/kg every two weeks for 4 weeks significantly reduced IL-33-induced eosinophilic airway inflammation in mice [6].

References:
[1] FitzGerald J M, Bleecker E R, Nair P, et al. Benralizumab, an anti-interleukin-5 receptor α monoclonal antibody, as add-on treatment for patients with severe, uncontrolled, eosinophilic asthma (CALIMA): a randomised, double-blind, placebo-controlled phase 3 trial[J]. The Lancet, 2016, 388(10056): 2128-2141.
[2] Pelaia C, Calabrese C, Vatrella A, et al. Benralizumab: from the basic mechanism of action to the potential use in the biological therapy of severe eosinophilic asthma[J]. BioMed research international, 2018, 2018(1): 4839230.

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[3] Sehmi R, Lim H F, Mukherjee M, et al. Benralizumab attenuates airway eosinophilia in prednisone-dependent asthma[J]. Journal of Allergy and Clinical Immunology, 2018, 141(4): 1529-1532. e8.
[4] Kolbeck R, Kozhich A, Koike M, et al. MEDI-563, a humanized anti–IL-5 receptor α mAb with enhanced antibody-dependent cell-mediated cytotoxicity function[J]. Journal of Allergy and Clinical Immunology, 2010, 125(6): 1344-1353. e2.
[5] Piazzetta G L, Di Agostino S, Lobello N, et al. Preliminary Effects of Benralizumab in an AML Cell Model with Promyelocytic Features Expressing IL-5R: An Exploratory Proof-of-Concept Study[J]. Biomedicines, 2026, 14(3): 652.
[6] Nunomura S, Ito R, Nanri Y, et al. Novel mechanisms by which benralizumab suppresses IgE expression in human B cells in humanized mice[J]. Allergy, 2023, 78(12).

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