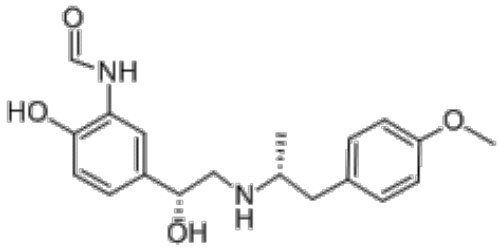
Product Data Sheet

Product Name: Formoterol
Cat. No.: GF11341

Chemical Properties

Cas. No.	73573-87-2		
Formula	$C_{19}H_{24}N_2O_4$	M.Wt	344.4
Solubility	DMSO : 250 mg/mL (725.90 mM; Need ultrasonic)	Storage	-20°C
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



Protocol

Cell experiment [1]:

Cell lines	Bronchial epithelial (BE) cells
Preparation Method	BE cells were obtained from airway brushings. Cells were incubated for 24h with Formoterol (0.01% DMSO drug vehicle), and then infected with 0.25 mL of rhinovirus-16 (5×10^6 plaque forming units [PFU]/mL). After 24h, cytokine secretion (TNFα) was analyzed.

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Reaction Conditions	0.1μM; 24h
Applications	Formoterol inhibited secretion of TNFα in the cells.

Animal experiment [2]:

Animal models	Male Balb/c mice
Preparation Method	The mice received doxorubicin hydrochloride (DOX) to induce muscle wasting. One of the groups treated with Formoterol, and another not submitted to Formoterol treatment received saline solution (0.9%) by the corresponding route of administration. The mice were euthanized for sample collection after 4 weeks.
Dosage form	1mg/kg; 4 weeks; s.c.
Applications	Formoterol protected against DOX-induced increase in Fbxo32 and Trim63 gene expression.

References:

[1] Bochkov Y A, Busse W W, Brockman-Schneider R A, et al. Budesonide and formoterol effects on rhinovirus replication and epithelial cell cytokine responses [J]. Respiratory research, 2013, 14(1): 98.
[2] De Lima Junior E A, Teixeira A A S, Silveira L S, et al. Formoterol reduces muscle wasting in mice undergoing doxorubicin chemotherapy [J]. Frontiers in oncology, 2023, 13: 1237709.

Background

Product Data Sheet

Formoterol is a kind of long-acting β2-adrenergic receptor (β2AR) agonist [1]. Formoterol is widely used for symptomatic relief in asthma and control of chronic obstructive pulmonary disease (COPD) [2]. The therapeutic mechanism of Formoterol involves both bronchodilation through airway smooth muscle relaxation and anti-inflammatory activity [2].

Formoterol (0.1μM; 24h) inhibited secretion of TNFα in the bronchial epithelial (BE) cells infected with rhinovirus [3]. Formoterol (1μM; 24h) effectively reduced tert-butyl hydroperoxide-induced SH-SY5Y cell death [1]. Formoterol (0.1nM~1μM; 24h) inhibited the IgE-dependent release of histamine from human lung mast cells in a concentration-dependent manner [4].

Formoterol (1mg/kg; 4 weeks; s.c.) decreased the expression of Fbxo32 and Trim63 in muscle wasting Balb/c mice induced by doxorubicin hydrochloride [5]. Formoterol (1mg/kg; 2 weeks; i.p.) prevented abdominal aortic aneurysm formation in erythropoietin-induced ApoE$^{-/-}$ mice [2].

References:

[1] Chang J C, Chang H S, Chao Y C, et al. Formoterol acting via β2-adrenoreceptor restores mitochondrial dysfunction caused by parkinson's disease-related UQCRC1 mutation and improves mitochondrial homeostasis including dynamic and transport [J]. Biology, 2024, 13(4): 231.
[2] Zhang J, Cao Y, Ren R, et al. Medium-dose formoterol attenuated abdominal aortic aneurysm induced by EPO via β2AR/cAMP/SIRT1 pathway [J]. Advanced science, 2024, 11(15): e2306232.
[3] Bochkov Y A, Busse W W, Brockman-Schneider R A, et al. Budesonide and formoterol effects on rhinovirus replication and epithelial cell cytokine responses [J]. Respiratory research, 2013, 14(1): 98.
[4] Scola A M, Chong L K, Suvarna S K, et al. Desensitisation of mast cell beta2-adrenoceptor-mediated responses by salmeterol and formoterol [J]. British journal of pharmacology, 2004, 141(1): 163-171.
[5] De Lima Junior E A, Teixeira A A S, Silveira L S, et al. Formoterol reduces muscle wasting in mice undergoing doxorubicin chemotherapy [J]. Frontiers in oncology, 2023, 13: 1237709.

Caution: Product has not been fully validated for medical applications. For research use only.
Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com
Address: 10292 Central Ave. #205, Montclair, CA, USA