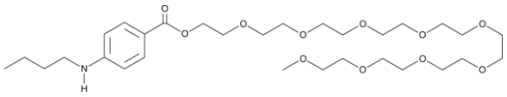
Product Data Sheet

Product Name: Benzonatate
Cat. No.: GC42919

Chemical Properties

Cas. No.	104-31-4		
Chemical Name	4-(butylamino)-benzoic acid, 3,6,9,12,15,18,21,24,27-nonaoxaoctacos-1-yl ester		
SMILES	O=C(OCCOCCOCCOCCOCCOCCOCCOCCOCCOC)C1=CC=C(NCCCC)C=C1		
Formula	C30H53NO11	M.Wt	603.8
Solubility	DMF: 50 mg/ml,DMSO: 50 mg/ml,Ethanol: 50 mg/ml,Ethanol:PBS(pH 7.2) (1:1): 0.5 mg/ml	Storage	Store at -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

Animal experiment [1]:

Animal models	Sprague-Dawley rats

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Preparation Method	Sprague-Dawley rats were single housed in a temperature-controlled room with a 12:12h light-dark cycle and allowed ad libitum access to water and food. Rats were anesthetized using isoflurane. A 23-gauge needle was introduced posteromedial to the greater trochanter, and upon contact with the bone, 0.3ml of Benzonatate (12.4mM) was injected, depositing the injectate over the sciatic nerve. Rats were euthanized with carbon dioxide four days after injection, the time point at which local anesthetic inflammation and toxicity is expected. The sciatic nerve and surrounding tissues were harvested, fixed in 10% neutral buffered formalin, embedded in paraffin, sectioned, and stained with hematoxylin and eosin using standard techniques.
Dosage form	0.3ml (12.4mM) for once; sciatic nerve injection
Applications	Benzonatate treatment caused inflammation and myotoxicity in sciatic nerve and surrounding tissues of rats.

References:

[1] McGuire A, Ostertag-Hill C A, Aizik G, et al. Benzonatate as a local anesthetic[J]. PLoS One, 2023, 18(4): e0284401.

Background

Benzonatate, a long chain polyglycol derivative chemically related to procaine, is a peripherally-acting and oral antitussive [1]. The antitussive effect of benzonatate is achieved by inhibiting the pulmonary stretch receptors, and it is realized through reversible and concentration-dependent inhibition of voltage-gated sodium channels (including Nav1.7) [2]. Benzonatate has been used to prevent the initiation and propagation of action potentials in the nerves responsible for detecting and responding to irritants in the airways [3].

In vivo, Benzonatate was injected at the sciatic nerve of Sprague-Dawley rats at a dose of 0.3ml (12.4mM) for 4 days, which induced sensory and motor blockage and caused inflammation and myotoxicity[4].

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References:

[1] Dicpinigaitis P V, Gayle Y E, Solomon G, et al. Inhibition of cough-reflex sensitivity by benzonatate and guaifenesin in acute viral cough[J]. Respiratory medicine, 2009, 103(6): 902-906.
[2] Evans M S, Maglinger G B, Fletcher A M, et al. Benzonatate inhibition of voltage-gated sodium currents[J]. Neuropharmacology, 2016, 101: 179-187.
[3] Foti Randazzese S, Toscano F, Gambadauro A, et al. Neuromodulators in acute and chronic cough in children: an update from the literature[J]. International Journal of Molecular Sciences, 2024, 25(20): 11229.
[4] McGuire A, Ostertag-Hill C A, Aizik G, et al. Benzonatate as a local anesthetic[J]. PLoS One, 2023, 18(4): e0284401.

Caution: Product has not been fully validated for medical applications. For research use only.
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