

Product Data Sheet

Product Name: Esomeprazole Sodium

Cat. No.: GC10599

Chemical Properties

Cas. No. 161796-78-7

Chemical Name sodium;5-methoxy-2-[(S)-(4-methoxy-3,5-dimethylpyridin-2-yl)methylsulfinyl]benzimidazole-3-ide

SMILES CC1=CN=C(C(=C1OC)C)CS(=O)C2=NC3=C([N-]2)C=C(C=C3)OC.[Na+]

Formula $C_{17}H_{18}N_3NaO_3S$

M.Wt 367.4

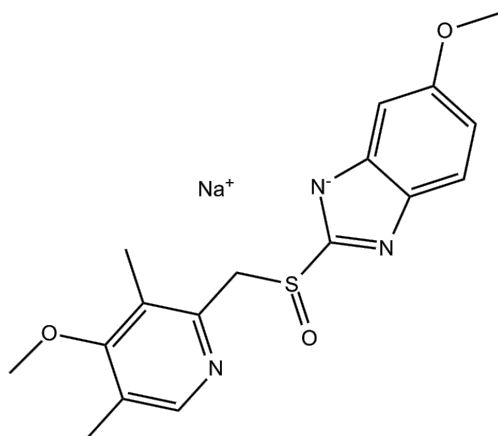
Solubility $\geq 140.8\text{mg/mL}$ in DMSO

Storage 4°C, sealed storage, away from moisture and light, unstable in solution, ready to use.

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]:

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

Product Data Sheet

Cell lines Human lung epithelial cells

Preparation Method Human lung epithelial cells (7×10^5 cells) were seeded in 25cm^2 flasks and incubated in a humidified 5% CO_2 incubator at 37°C . Once the cells reached about 70% confluency, they were induced with bleomycin ($25\mu\text{g/ml}$ final concentration in $20\mu\text{L}$) or control (equal volume of water), and cultured in 4 mL fully-supplemented media in the absence or presence of different concentrations of Esomeprazole Sodium (1-100 μM) for 24h. Subsequently, the cells were harvested for gene and protein expression studies.

Reaction
Conditions 1-100 μM ; 24h

Applications Esomeprazole Sodium dose-dependently suppressed bleomycin-induced iNOS expression, down-regulated $\text{TNF-}\alpha$, IL-1 β and IL-6, blocked TGF- β -driven collagen I/III/V transcription, and abolished ECM-related gene up-regulation without measurable cytotoxicity in human lung epithelial cells.

Animal experiment [2]:

Animal models C57BL/6J mice

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

Product Data Sheet

Preparation Method 8-weeks old C57BL/6J mice (25–30g body weight) were used to evaluate the efficacy of Esomeprazole Sodium in a 3-weeks course of cotton smoke-induced lung injury. All the animals were randomized into no exposure (n=6) and exposure groups. Next, the exposure group of animals were subdivided into vehicle (n=10) and Esomeprazole Sodium (n=10) groups and were subjected to cotton smoke for 21-days. Starting at 2 days post inhalation injury, the vehicle group were orally treated daily with 10% ethanol. In the Esomeprazole Sodium group, the animals were treated with equal volume of 300mg/kg Esomeprazole Sodium in 10% ethanol daily starting from day 10 postinitiation of smoke exposure until necropsy. At necropsy, blood samples were collected by cardiac puncture and the lung, liver, heart, and kidney tissues were harvested for organ weight and histopathological comparisons.

Dosage form 300mg/kg/day; p.o.; 11 days

Applications Esomeprazole Sodium elevated plasma ADMA, reversed cotton-smoke-induced lung fibrosis, reduced collagen deposition, and lowered circulating TNF- α , IL-1 β , MMP7 and NO over-production in C57BL/6J mice without affecting pulmonary inflammation or organ weights.

References:

- [1] Ebrahimpour A, Wang M, Li L, et al. Esomeprazole attenuates inflammatory and fibrotic response in lung cells through the MAPK/Nrf2/HO1 pathway. J Inflamm (Lond). 2021;18(1):17.
- [2] Nelson C, Lee J, Ko K, et al. Therapeutic Efficacy of Esomeprazole in Cotton Smoke-Induced Lung Injury Model. Front Pharmacol. 2017;8:16.

Background

Esomeprazole Sodium is a potent and orally active proton pump inhibitor^[1]. Esomeprazole Sodium reduces gastric acid secretion by covalently modifying the sulfhydryl groups of the proton pump and

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

Product Data Sheet

inhibiting the activity of H^+/K^+ -ATPase in gastric parietal cells^[2]. Esomeprazole Sodium is commonly used in research on gastroesophageal reflux disease (GERD), peptic ulcers, and Helicobacter pylori infections^[3].

In vitro, Esomeprazole Sodium (50 μ M; 20h) reduced MDA-MB-468 triple-negative breast cancer cell viability and lowered intracellular pH with an EC_{50} =70 μ M, decreased gastric-type H^+/K^+ -ATPase expression, and enhanced doxorubicin cytotoxicity but did not have significant effect on non-cancerous breast epithelial MCF-10A cells^[4]. Treatment of primary human lung epithelial cells with Esomeprazole Sodium (1–100 μ M; 24h) dose-dependently suppressed bleomycin-induced iNOS expression, down-regulated TNF- α , IL-1 β and IL-6, blocked TGF- β -driven collagen I/III/V transcription, and abolished ECM-related gene up-regulation without measurable cytotoxicity^[5].

In vivo, Esomeprazole Sodium (300mg/kg/day; p.o.; 11 days) elevated plasma ADMA, reversed cotton-smoke-induced lung fibrosis, reduced collagen deposition, and lowered circulating TNF- α , IL-1 β , MMP7 and NO over-production in C57BL/6J mice without affecting pulmonary inflammation or organ weights^[6]. Esomeprazole Sodium (0.5mg/kg/day; i.v.; 13 days) reversed baseline low-pretreatment gastric juice pH (4.25 ± 2.39) to 6.43 ± 1.18 and sustained $pH \geq 4$ in 75% of adult Quarter Horse mares, while improving ulcer scores without adverse effects^[7].

References:

- [1] Thitiphuree S, Talley NJ. Esomeprazole, a new proton pump inhibitor: pharmacological characteristics and clinical efficacy. Int J Clin Pract. 2000;54(8):537-541.
- [2] Shin JM, Munson K, Vagin O, Sachs G. The gastric HK-ATPase: structure, function, and inhibition. Pflugers Arch. 2009;457(3):609-622.
- [3] Johnson TJ, Hedge DD. Esomeprazole: a clinical review. Am J Health Syst Pharm. 2002;59(14):1333-1339.
- [4] Goh W, Sleptsova-Freidrich I, Petrovic N. Use of proton pump inhibitors as adjunct treatment for triple-negative breast cancers. An introductory study. J Pharm Pharm Sci. 2014;17(3):439-446.
- [5] Ebrahimpour A, Wang M, Li L, et al. Esomeprazole attenuates inflammatory and fibrotic response in lung cells through the MAPK/Nrf2/HO1 pathway. J Inflamm (Lond). 2021;18(1):17.
- [6] Nelson C, Lee J, Ko K, et al. Therapeutic Efficacy of Esomeprazole in Cotton Smoke-Induced Lung Injury Model. Front Pharmacol. 2017;8:16.
- [7] Videla R, Sommardahl CS, Elliott SB, Vasili A, Andrews FM. Effects of intravenously administered

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

Product Data Sheet

esomeprazole sodium on gastric juice pH in adult female horses. J Vet Intern Med. 2011;25(3):558-562.

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