

Product Data Sheet

Product Name: Alprostadil

Cat. No.: GC17347

Chemical Properties

Cas. No. 745-65-3

Chemical Name 7-[(1R,2R,3R)-3-hydroxy-2-[(E,3S)-3-hydroxyoct-1-enyl]-5-oxocyclopentyl]heptanoic acid

SMILES CCCCC(C=CC1C(CC(=O)C1CCCCCCC(=O)O)O)O

Formula $C_{20}H_{34}O_5$

M.Wt 354.48

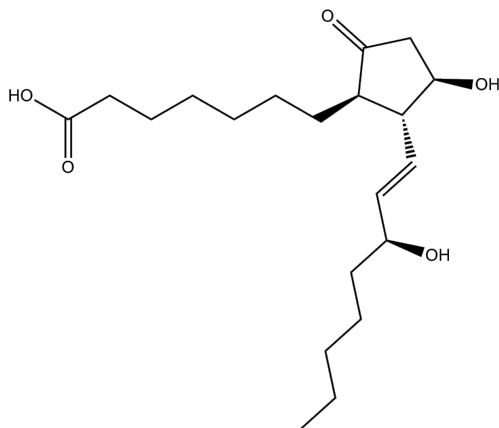
Solubility $\geq 13.4\text{mg/mL}$ in DMSO

Storage Store at -20°C , stored under nitrogen, 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.

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Cell lines	Human umbilical vein endothelial cells (HUVEC)
Preparation Method	Alprostadil was incubated with HUVEC for 8 h at 0.1, 1.0, 5.0, 10.0, or 50.0 ng/ml under normoxic conditions. Cells were then exposed in the presence of alprostadil to either normoxic or hypoxic conditions (6% O ₂ -94% N ₂) for an additional 12 or 18 h.
Reaction Conditions	0.1-50 ng/ml; 8-26h
Applications	Incubation with alprostadil dose-dependently upregulated mRNA expression of eNOS and VEGF under normoxia and downregulated HIF-1 α expression. Exposure of HUVEC to hypoxia increased eNOS, VEGF, and HIF-1 α mRNA and protein compared with normoxic conditions.

Animal experiment [2]:

Animal models	Male Sprague-Dawley rats (Acute Pancreatitis model)
Preparation Method	Rat was intraperitoneally injected with alprostadil 5 ug/kg 30 min before AP modeling. Rats were sacrificed after 48 h.
Dosage form	5 ug/kg; i.p
Applications	Alprostadil could reduce oxidative stress and inhibits proinflammatory cytokine release.

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References:

- [1]. Haider DG, Bucek RA, et.al. PGE1 analog alprostadil induces VEGF and eNOS expression in endothelial cells. Am J Physiol Heart Circ Physiol. 2005 Nov;289(5):H2066-72. doi: 10.1152/ajpheart.00147.2005. Epub 2005 Jun 10. PMID: 15951350.
- [2]. Fei S, Li W, et.al. Protective Effect of Alprostadil on Acute Pancreatitis in Rats via Inhibiting Janus Kinase 2 (JAK2)/STAT3 Signal Transduction Pathway. Med Sci Monit. 2019 Oct 13;25:7694-7701. doi: 10.12659/MSM.919148. PMID: 31606729; PMCID: PMC6807527.

Background

Alprostadil functions as a prostanoid receptor ligand, exhibiting binding affinities K_{is} of 1.1 nM, 2.1 nM, 10 nM, 33 nM, and 36 nM for murine EP3, EP4, EP2, IP, and EP1, correspondingly. Alprostadil can inhibit platelet aggregation and thrombin A2 production, and has diuretic and renal function protection [1-3].

Alprostadil(0.1-50 ng/ml; 8-26h) causes an upregulation of eNOS and VEGF protein and mRNA expression in HUVEC and decreases HIF-1 α [4]. Alprostadil (10 ng/mL; 24h) reduces apoptosis and improves the homing of mesenchymal stem cells in pulmonary arterial hypertension by regulating hypoxia-inducible factor 1 α [5].

Alprostadil(5 μ g/kg; i.p) can reduce pancreatic tissue damage, delay pancreatic cell apoptosis, and reduce inflammation and anti-oxidative stress by inhibiting the JAK2/STAT3 signal pathway, thus protecting the pancreas in acute pancreatitis rat model[6]. Alprostadil (0.3125, 0.625, and 1.25 mg/kg/d; i.p) attenuates AngII-induced cardiac hypertrophy via E-prostanoid (EP) 3 receptor activation and Netrin-1 upregulation[7].

References:

- [1]. Kiriya M, Ushikubi F, et.al. Ligand binding specificities of the eight types and subtypes of the mouse prostanoid receptors expressed in Chinese hamster ovary cells. Br J Pharmacol. 1997 Sep;122(2):217-24. doi: 10.1038/sj.bjp.0701367. PMID: 9313928; PMCID: PMC1564924.
- [2]. Cattaneo MG, Pola S, et.al. Alprostadil suppresses angiogenesis in vitro and in vivo in the murine Matrigel plug assay. Br J Pharmacol. 2003 Jan;138(2):377-85. doi: 10.1038/sj.bjp.0705051. PMID: 12540529; PMCID: PMC1573673.
- [3]. Hauck EW, Altinkilic BM, et.al. Prostaglandin E1 long-term self-injection programme for treatment

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- of erectile dysfunction--a follow-up of at least 5 years. *Andrologia*. 1999;31 Suppl 1:99-103. doi: 10.1111/j.1439-0272.1999.tb01458.x. PMID: 10643527.
- [4]. Haider DG, Bucek RA, et.al. PGE1 analog alprostadil induces VEGF and eNOS expression in endothelial cells. *Am J Physiol Heart Circ Physiol*. 2005 Nov;289(5):H2066-72. doi: 10.1152/ajpheart.00147.2005. Epub 2005 Jun 10. PMID: 15951350.
- [5]. Jiang DT, Tuo L, et.al. Prostaglandin E1 reduces apoptosis and improves the homing of mesenchymal stem cells in pulmonary arterial hypertension by regulating hypoxia-inducible factor 1 alpha. *Stem Cell Res Ther*. 2022 Jul 16;13(1):316. doi: 10.1186/s13287-022-03011-x. PMID: 35842683; PMCID: PMC9288720.
- [6]. Fei S, Li W, et.al. Protective Effect of Alprostadil on Acute Pancreatitis in Rats via Inhibiting Janus Kinase 2 (JAK2)/STAT3 Signal Transduction Pathway. *Med Sci Monit*. 2019 Oct 13;25:7694-7701. doi: 10.12659/MSM.919148. PMID: 31606729; PMCID: PMC6807527.
- [7]. Shen Y, Wang X, et.al. Prostaglandin E1 attenuates AngII-induced cardiac hypertrophy via EP3 receptor activation and Netrin-1 upregulation. *J Mol Cell Cardiol*. 2021 Oct;159:91-104. doi: 10.1016/j.yjmcc.2021.06.009. Epub 2021 Jun 18. PMID: 34147480.

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