

Product Data Sheet

Product Name: Uridine triphosphate (UTP)

Cat. No.: GC33830

Chemical Properties

Cas. No. 63-39-8

SMILES O[C@H]1[C@H](N2C(NC(C=C2)=O)=O)O[C@H](COP(=O)(OP(=O)(O)=O)(O)=O)(O)=O)[C@H]1O

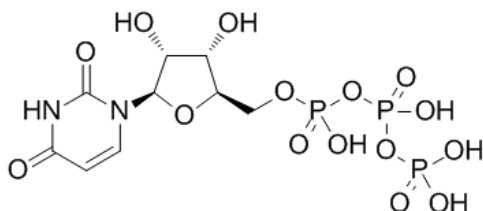
Formula $C_9H_{15}N_2O_{15}P_3$ M.Wt 484.14

Solubility Water : ≥ 150 mg/mL (309.83 mM) 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

Cell experiment: Pancreatic duct epithelial cells are treated with (0.1 μM -1 mM) uridine triphosphate. BrdU is added after different time points (12-24 hours). Proliferation is measured using the BrdU incorporation assay in triplicate[2].

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

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Animal experiment: Rats: Four main groups are tested: (1) sham without LAD ligation, (2) LAD ligation, (3) injected with UTP (0.44 µg/kg i.v.) 30 min before MI, (4) UTP injection (4.4 µg/kg i.v.) 24 h prior to MI. Several different concentrations of UTP are tested (0.044–44.4 µg/kg). Left ventricular systolic pressure (LVSP), end-diastolic pressure (LVEDP) and heart rates are monitored before, after UTP treatment and post MI[3].

References:

- [1]. Lamarca A, et al. Uridine 5'-triphosphate promotes in vitro Schwannoma cell migration through matrix metalloproteinase-2 activation. PLoS One. 2014 Jun 6;9(6):e98998.
- [2]. Choi JH, et al. Uridine triphosphate increases proliferation of human cancerous pancreatic duct epithelial cells by activating P2Y2 receptor. Pancreas. 2013 May;42(4):680-6.
- [3]. Yitzhaki S, et al. Uridine-5'-triphosphate (UTP) reduces infarct size and improves rat heart function after myocardial infarct. Biochem Pharmacol. 2006 Oct 16;72(8):949-55.
- [4]. Iwaki Y, et al. Enhancement of antibody production against rabies virus by uridine 5'-triphosphate in mice. Microbes Infect. 2014 Mar;16(3):196-202.

Background

Uridine triphosphate (UTP; Uridine 5'-triphosphate) is a pyrimidine nucleoside triphosphate that participates in glycogen metabolism and synthesis of RNA during transcription.

Uridine triphosphate treatment induces Schwannoma cell migration through activation of P2Y2 receptors and through the increase of extracellular matrix metalloproteinase-2 (MMP-2) activation and expression[1]. Uridine triphosphate-induced proliferation is mediated by protein kinase D, Src-family tyrosine kinase, Ca/calmodulin-dependent protein kinase II, phosphatidylinositol 3-kinase (PI3K), Akt, and phospholipase D. Uridine triphosphate increases phosphorylation of Akt through protein kinase C, Src-family tyrosine kinase, Ca/calmodulin-dependent protein kinase II, and PI3K[2].

Uridine triphosphate reduces mitochondrial calcium levels following hypoxia. Early or late uridine triphosphate preconditioning is effective to reduce infarct size and superior myocardial function[3]. Uridine triphosphate treatment increases the number of monocytes and macrophages infiltrating the pouch and up-regulates the gene expression of IL-4 and IL-13 in the regional lymph nodes[4].

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[1]. Lamarca A, et al. Uridine 5'-triphosphate promotes in vitro Schwannoma cell migration through matrix metalloproteinase-2 activation. PLoS One. 2014 Jun 6;9(6):e98998. [2]. Choi JH, et al. Uridine triphosphate increases proliferation of human cancerous pancreatic duct epithelial cells by activating P2Y2 receptor. Pancreas. 2013 May;42(4):680-6. [3]. Yitzhaki S, et al. Uridine-5'-triphosphate (UTP) reduces infarct size and improves rat heart function after myocardial infarct. Biochem Pharmacol. 2006 Oct 16;72(8):949-55. [4]. Iwaki Y, et al. Enhancement of antibody production against rabies virus by uridine 5'-triphosphate in mice. Microbes Infect. 2014 Mar;16(3):196-202.

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