

Product Data Sheet

Product Name: Riboflavin phosphate

Cat. No.: GC37530

Chemical Properties

Cas. No. 130-40-5

SMILES CC1=CC2=C(C=C1C)N=C(C(N2C[C@H](O)[C@H](O)[C@H](O)COP([O-])(O)=O)=N3)C(=O)N3=O.[Na+]

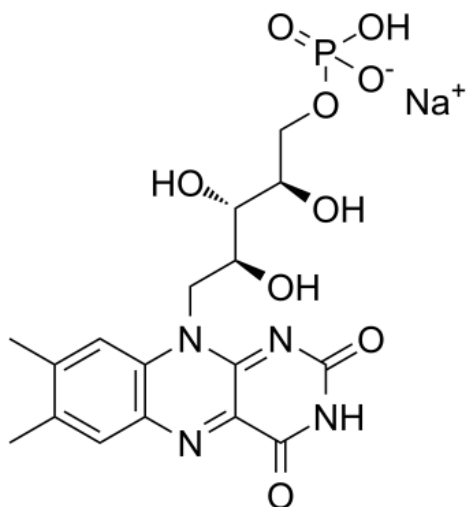
Formula $C_{17}H_{20}N_4NaO_9P$ M.Wt 478.33

Solubility 50mg/mL in Water 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 [1]:

Cell lines Mouse macrophages

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

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Preparation Method Macrophages were harvested from 10 untreated mice and pooled. Then the macrophages were treated with various concentrations of Riboflavin phosphate sodium or 100µg/ml muramyldipeptide, and were incubated for 24h at 37°C in slide chambers.

Reaction Conditions 6.25, 12.5, 25, 50, 100, 200µg/mL; 24h

Applications The phagocytosis of latex particles by mouse peritoneal macrophages showed that Riboflavin phosphate sodium directly activated macrophages in vitro.

Animal experiment [2]:

Animal models Male ICR mice

Preparation Method Mice were given an i.v. bolus injection of lipopolysaccharide at 12mg/kg through the tail vein. Six hours after lipopolysaccharide injection, mice were treated with saline (control), Riboflavin phosphate sodium (10, 20, 40 and 80mg/kg) by i.v. infusion for 6h at a speed of 0.58ml/h via the tail vein using an infusion pump.

Dosage form 10, 20, 40 and 80mg/kg; i.v.; 6h

Applications Riboflavin phosphate sodium significantly reduced the lethality of *Escherichia coli* and *Staphylococcus aureus* infection. The i.v. infusion of Riboflavin phosphate sodium reduced the elevations of proinflammatory cytokines and nitric oxide induced by lipopolysaccharide.

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References:

- [1] Kimura, M., Suzuki, M., Araki, S., et al. In vitro and in vivo effects of riboflavin sodium phosphate on the phagocytic activity of peritoneal macrophages in mice. *Animal Science and Technology*. 1996. 67, 368 – 373.
- [2] Toyosawa T, Suzuki M, Kodama K, Araki S. Effects of intravenous infusion of highly purified vitamin B2 on lipopolysaccharide-induced shock and bacterial infection in mice. *Eur J Pharmacol*. 2004 May 25;492(2-3):273-80.

Background

Riboflavin phosphate sodium is a water-soluble phosphate of riboflavin, which retains the main structure and function of riboflavin. the pure Riboflavin phosphate sodium solution exhibits the maximum emission peak at 565nm^[1]. Riboflavin phosphate sodium is a well-known oral nutritional supplement, has been widely used to treat localized inflammatory diseases, such as angulus infectiosus, chilitis, glossitis and radiotherapy related esophagitis^{[2][3]}.

In vitro, the macrophages were treated with various concentrations of Riboflavin phosphate sodium (6.25-200µg/ml) and were incubated for 24h at 37°C in slide chambers. Phagocytic activity was then determined. Riboflavin phosphate sodium directly activated macrophages in vitro^[4].

In vivo, Riboflavin phosphate sodium (100mg/kg) was injected intraperitoneally or intravenously into ICR male mice at 1 day before the phagocytosis assay. The treated mice showed a significantly higher phagocytic index. Riboflavin phosphate sodium could enhance macrophage function in vivo^[4]. Riboflavin phosphate sodium can be applied as the treatment of sepsis and septic shock. Riboflavin phosphate sodium (10, 20, 40, 80mg/kg) was administered into ICR mice 6h after lipopolysaccharide injection or 1h after bacterial infection by 6h i.v. infusion. Riboflavin phosphate sodium significantly improved lipopolysaccharide-induced endotoxin shock and reduced the lethality of *Escherichia coli* and *Staphylococcus aureus* infection. The i.v. infusion of Riboflavin phosphate sodium reduced the elevations of proinflammatory cytokines and nitric oxide induced by lipopolysaccharide^[5].

References:

- [1] Feng G Y, Zhang S T, Zhong S L, et al. Temperature and pH dual-responsive supramolecular

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hydrogels based on riboflavin sodium phosphate and 2,6-Diaminopurine with thixotropic and fluorescent properties. Colloids and Surfaces A: Physicochemical and Engineering Aspects. 2021 Dec. Volume 630, 127548

[2] Kodama K, Suzuki M, Toyosawa T, Araki S. Inhibitory mechanisms of highly purified vitamin B2 on the productions of proinflammatory cytokine and NO in endotoxin-induced shock in mice. Life Sci. 2005 Nov 26;78(2):134-9.

[3] Shen K, Huang X E. Clinical investigation in effect of riboflavin sodium phosphate on prevention and treatment for patients with radiotherapy related esophagitis. Asian Pac J Cancer Prev. 2015;16(4):1525-7.

[4] Kimura, M., Suzuki, M., Araki, S., et al. In vitro and in vivo effects of riboflavin sodium phosphate on the phagocytic activity of peritoneal macrophages in mice. Animal Science and Technology. 1996. 67, 368 – 373.

[5] Toyosawa T, Suzuki M, Kodama K, Araki S. Effects of intravenous infusion of highly purified vitamin B2 on lipopolysaccharide-induced shock and bacterial infection in mice. Eur J Pharmacol. 2004 May 25;492(2-3):273-80.

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