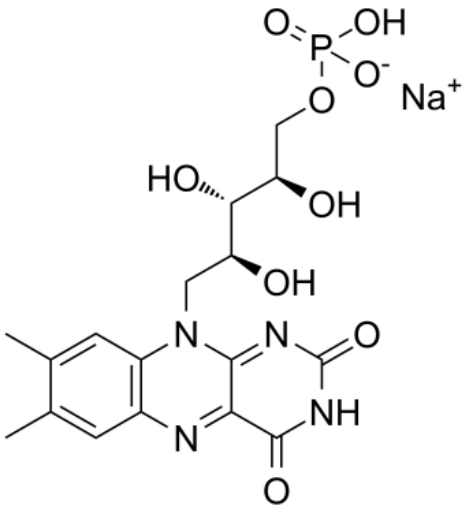
Product Data Sheet

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(NC3=O)=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

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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.

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