

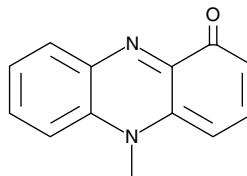
Product Information



Pyocyanin

Item No. 10009594

CAS Registry No.: 85-66-5
Formal Name: 5-methyl-1(5H)-phenazinone
Synonyms: Sanasin, Sanazin, Pyocyanine
MF: C₁₃H₁₀N₂O
FW: 210.2
Purity: ≥98%
Stability: ≥2 years at -20°C
Supplied as: A crystalline solid
UV/Vis.: λ_{max}: 238, 322, 720 nm



Laboratory Procedures

For long term storage, we suggest that pyocyanin be stored as supplied at -20°C. It will be stable for at least two years. Pyocyanin is supplied as a crystalline solid. A stock solution may be made by dissolving the crystalline solid in an organic solvent purged with an inert gas. Pyocyanin is soluble in organic solvents such as ethanol, DMSO, and dimethyl formamide (DMF). The solubility of pyocyanin in ethanol and DMSO is approximately 5 mg/ml and approximately 2.5 mg/ml in DMF.

Pyocyanin is sparingly soluble in aqueous buffers. For maximum solubility in aqueous buffers, pyocyanin should first be dissolved in ethanol and then diluted with the aqueous buffer of choice. Pyocyanin has a solubility of approximately 0.5 mg/ml in a 1:1 solution of ethanol:PBS (pH 7.2) using this method. We do not recommend storing the aqueous solution for more than one day.

Pseudomonas aeruginosa (*P. aeruginosa*) is a common pathogen affecting immunocompromised patients with acute diseases such as pneumonia and vasculitis or chronic diseases such as cystic fibrosis. It produces several phenazine toxic metabolites, the most predominant of which is a blue pigment, pyocyanin. Pyocyanin, which can reach concentrations of 100 μM in cystic fibrosis patients infected with *P. aeruginosa*, activates the aryl hydrocarbon receptor with a K_i value of 5.4 μM.¹ This induces the expression of both detoxifying enzymes, resulting in pyocyanin degradation, and cytokines that facilitate the clearance of bacteria.¹ Pyocyanin has been shown to accelerate neutrophil apoptosis *in vitro*, resulting in resolution of acute inflammation, which is beneficial for bacterial survival. It also induces a 10-fold acceleration of neutrophil apoptosis *in vivo*.² Pyocyanin production results in reduced bacterial clearance from the lungs of immunocompromised patients. It has also been reported to induce apoptosis in human lung epithelial cells and to induce premature cellular senescence in mammalian cells.³ Pyocyanin undergoes nonenzymatic reduction by NADPH, which produces hydrogen peroxide and depletes intracellular glutathione levels, causing oxidative stress in susceptible cells.⁴

References

1. Moura-Alves, P., Faé, K., Houthuys, E., *et al.* AhR sensing of bacterial pigments regulates antibacterial defence. *Nature* **512(7515)**, 387-392 (2014).
2. Allen, L., Dockrell, D.H., Pattery, T., *et al.* Pyocyanin production by *Pseudomonas aeruginosa* induces neutrophil apoptosis and impairs neutrophil-mediated host defenses *in vivo*. *J. Immunol.* **174**, 3643-3649 (2005).
3. Muller, M. Premature cellular senescence induced by procyanin, a redox active *Pseudomonas aeruginosa* toxin. *Free Radic. Biol. Med.* **41**, 1670-1677 (2006).
4. Muller, M. Pyocyanin induces oxidative stress in human endothelial cells and modulates the glutathione redox cycle. *Free Radic. Biol. Med.* **33(11)**, 1527-1533 (2002).

Related Products

For a list of related products please visit: www.caymanchem.com/catalog/10009594

WARNING: THIS PRODUCT IS FOR LABORATORY RESEARCH ONLY: NOT FOR ADMINISTRATION TO HUMANS. NOT FOR HUMAN OR VETERINARY DIAGNOSTIC OR THERAPEUTIC USE.

SAFETY DATA

This material should be considered hazardous until information to the contrary becomes available. Do not ingest, swallow, or inhale. Do not get in eyes, on skin, or on clothing. Wash thoroughly after handling. This information contains some, but not all, of the information required for the safe and proper use of this material. Before use, the user must review the complete Safety Data Sheet, which has been sent via email to your institution.

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