3050 Spruce Street, St. Louis, MO 63103 USA
Tel: (800) 521-8956 (314) 771-5765 Fax: (800) 325-5052 (314) 771-5757
email: techservice@sial.com sigma-aldrich.com

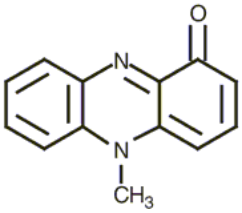
Product Information

Pyocyanin, Ready Made Solution from *Pseudomonas aeruginosa*

Catalog Number **R9532**
Storage Temperature –20 °C

CAS RN 85-66-5
Synonyms: Sanasin, Sanazin, Pyocyanine

Product Description



Molecular weight: 210.23
Molecular formula: $C_{13}H_{10}N_2O$

Purity: ≥98% (HPLC)

Pyocyanin is a blue-green pigment, which belongs to the Phenazine family. It is an electron acceptor, which stimulates redox cycling in bacteria, liver cells, and human epithelial cell lines.[1,2] Pyocyanin enhances oxidative metabolism, which increases the formation of intracellular reactive oxygen species (ROS) via reduction of NADPH.[1,3,4]

Pyocyanin also increases the release of the neutrophil chemoattractant interleukin-8 (IL-8) by airway epithelial cells both *in vitro* and *in vivo.* This involves signal transduction pathways that include oxidants, protein tyrosin kinases, and MAP-kinases. IL-8 secretion by these cells is in synergy with inflammatory cytokines.[1,4,5] Pyocyanin has been shown to accelerate neutrophil apoptosis *in vitro*. Mice infected with a pyocyanin-deficient strain of *P. aeruginosa* showed elevated levels of neutrophils, and neutrophil chemokines and cytokines, as well as compromised bacterial clearance from the lungs compared with mice infected with a wild type strain. This suggests that pyocyanin production by *P. aeruginosa* suppresses the acute inflammatory response by pathogen-driven acceleration of neutrophil apoptosis and by reducing local inflammation, and that this is advantageous for bacterial survival.[6]

Components

The product is supplied as a 5 mg/mL (24 mM) solution in DMSO.

Precautions and Disclaimer

For R&D use only. Not for drug, household, or other uses.

Storage/Stability

Store the product sealed at –20 °C. Under these conditions the product is stable for at least 2 years.

References

1. Kanthakumar, K., et al., Mechanisms of action of *Pseudomonas aeruginosa* pyocyanin on human ciliary beat *in vitro*. Infect. Immun., **61**, 2848-2853 (1993).
2. Da Silva, G.A., and de Almeida, E.A., Production of yellow-green fluorescent pigment by *Pseudomonas fluorescens*. *Braz. Arch*. Biol. Technol., **49**, 411-419 (2006).
3. Price-Whelan, A., et al., Pyocyanin alters redox homeostasis and carbon flux through central metabolic pathways in *Pseumonas aeruginosa* PA14. J. Bacteriol., **189,** 6372-6381 (2007).
4. O'Malley, Y.Q., et al., *Pseumonas aeruginosa* pyocyanin directly oxidizes glutathione and decreases its levels in airway epithelial cells. Am. J. Physiol. Lung Cell. Mol. Physiol., **287**, L94-L103 (2004).
5. Denning, G.M., et al., *Pseudomonas* pyocyanin increases interleukin-8 expression by human airway epithelial cells. Infect. Immun., **66**, 5777-5784 (1998).
6. Allen, L., et al., Pyocyanin production by *Pseudomonas aeruginosa* induces neutrophil apoptosis and impairs neutrophil-mediated host defenses *in vivo*. J. Immunol., **174**, 3643-3649 (2005).

RC,KAA,DWF,MAM 12/20-1