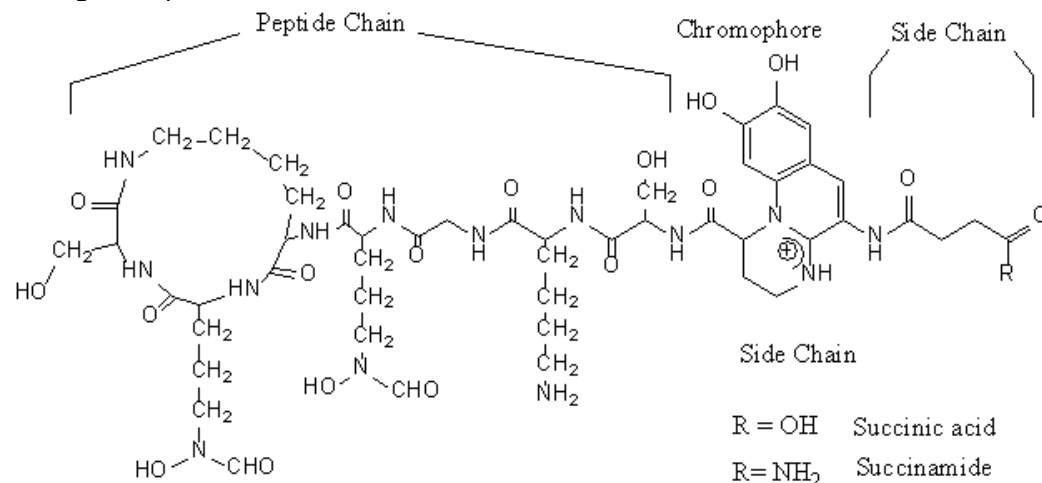


## Product Information

### Pyoverdines–Gallium(III) Complex from *Pseudomonas fluorescens*

Catalog Number **P8249**

Storage Temperature  $-20\text{ }^{\circ}\text{C}$



CAS RN 8062-00-8 (for pyoverdines)  
Synonym: Pseudobactins

#### Product Description

The product is a mixture containing primarily the following forms of pyoverdines with one gallium (Ga) ion bound per molecule:<sup>1</sup> succinic acid (MW = 1161, without gallium) and succinamide (MW = 1160, without gallium). The 2-hydroxyglutaramide (MW = 1190, without gallium) form is a minor component.

Purity: >90% (HPLC)

Pyoverdines, also called pseudobactins, are fluorescent siderophores that have high-affinity for iron(III) ions ( $10^{32}\text{ M}^{-1}$ ) and are synthesized by fluorescent pseudomonads under iron-deficient growth conditions.<sup>1</sup> They are composed of three different structural parts: a dihydroxyquinoline chromophore, which confers color and fluorescence; a side chain, generally a dicarboxylic acid or a dicarboxylic amide; and a variable peptidic chain comprising 6 to 12 amino acids, some of them being unusual.<sup>1-3</sup> The peptide chain contains two of the iron(III) binding sites, and the catecholates of the chromophore contains the third one. The peptide moiety is also involved in receptor recognition and binding.<sup>1,3</sup> The size and amino acid composition of pyoverdines are unique to each species. Despite the strain specificity of pyoverdine recognition and uptake, many fluorescent pseudomonads are able to utilize pyoverdines produced by other strains.<sup>1</sup>

Pyoverdines are not only iron chelators. The ferri-pyoverdine complex acts as a signaling molecule inducing the production of secreted virulence factors in *Pseudomonas aeruginosa*.<sup>4</sup> Pyoverdines are able to prevent iron toxicity produced by iron overload in hepatocyte cultures<sup>5</sup> and effectively scavenge hydroxyl and peroxy radicals.<sup>6</sup> Pyoverdines are also effective at acquiring iron from transferrin and lactoferrin.<sup>3</sup> This siderophore is also involved in the suppression of pythium induced damping-off of tomato<sup>7</sup> and promotion of growth in some higher-plants.<sup>8</sup> As opposed to ferri-pyoverdines, which promote the growth of both *P. fluorescens* and *P. aeruginosa* in minimal medium, gallium-pyoverdines act as growth inhibitors of both strains,<sup>9</sup> possibly due to gallium interference with bacterial iron metabolism.<sup>10</sup>

#### Precautions and Disclaimer

This product is for R&D use only, not for drug, household, or other uses. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.

#### Preparation Instructions

Soluble in water at 10 mg/ml.

#### Storage/Stability

Store at  $-20\text{ }^{\circ}\text{C}$ . Under these conditions the product is stable for 2 years. A solution in water is stable for at least 4 months at  $2-8\text{ }^{\circ}\text{C}$ .

## Related Products

Pyoverdines (Catalog Number P8124)

Pyoverdines - Fe complex (Catalog Number P8374)

## References

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4. Beare, P.A., *et al.*, Siderophore-mediated cell signaling in *Pseudomonas aeruginosa*: divergent pathways regulate virulence factor production and siderophores receptor synthesis. *Mol. Microbiol.*, **47**, 195-207 (2003).
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7. Buysens, S., *et al.*, Involvement of pyochelin and pyoverdin in suppression of pythium-induced damping-off of tomato by *Pseudomonas aeruginosa* TNSK2. *Appl. Environ. Microbiol.*, **62**, 865-871 (1996).
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9. Schlosser-Silverman, E., *et al.*, Biological applications of pyoverdines and their complexes with iron and gallium. Society for Industrial Microbiology Annual meeting, Baltimore, USA (2006).
10. Olakanmi, O., *et al.*, Gallium disrupts iron metabolism of mycobacteria residing within human macrophages. *Infect. Immun.*, **10**, 5619-5627 (2000).

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