

# The Pyoverdinin of *Pseudomonas fluorescens* G173, a Novel Structural Type Accompanied by Unexpected Natural Derivatives of the Corresponding Ferribactin

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The siderophores produced by *Pseudomonas fluorescens* G173 are unusual in several respects. So far all pyoverdins with a C-terminal cyclopeptidic substructure have in common that the  $\epsilon$ -amino group of an in-chain Lys is bound amidically to the carboxyl group of a C-terminal Ser or Thr and that N<sup>5</sup>-formyl-N<sup>5</sup>-hydroxy Orn (FoOHOrn) is the next amino acid after Lys. FoOHOrn may (cyclotetrapeptidic structures) be or may not (cyclotripeptidic structures) be followed by a further amino acid. In the pyoverdin described here Orn instead of Lys is the amino acid forming the cycle, FoOHOrn is replaced by AcOHOrn which does not follow the branching Orn but is the penultimate amino acid and finally the last amino acid is Asp. The producing strain which had been classified as *Pseudomonas fluorescens* may well be a new species.

Pyoverdins are frequently accompanied by ferribactins which are considered to be their biogenetic precursors. They always have the same amino acid chain as the co-occurring pyoverdins but the pyoverdin chromophore is replaced by a condensation product of L-Dab and D-Tyr with the amino group of Tyr bound to the  $\gamma$ -carboxyl group of Glu. A ferribactin having these structural characteristics is produced by the investigated strain, but it is accompanied by derivatives where the  $\alpha$ -amino group of Glu is partially or completely transformed into a hydroxamic acid by substitution with a hydroxyl and/or acetyl group.

*Key words:* *Pseudomonas fluorescens*, Pyoverdin, Ferribactin