

The Kümmerli lab at the Department of Quantitative Biomedicine is looking for a master student to carry out their thesis on the following project:

Evaluation of pyoverdines as antimicrobial agents against clinical bacterial isolates

Bacterial resistance to antibiotics is a growing global health concern, particularly in clinical settings where multidrug resistant pathogens pose a significant challenge. Pyoverdines, iron-chelating siderophores produced by *Pseudomonas* spp., play a crucial role in microbial competition by inducing iron starvation in competing bacteria. Previous studies have shown that pyoverdines effectively inhibit the growth of standard laboratory bacteria^{1,2}. This project aims to expand these findings by investigating whether pyoverdines have a similar effect on clinically relevant bacterial isolates obtained from patient at the Universitätsspital Zürich (USZ).

In addition to assessing the antimicrobial potential of pyoverdines, the project will investigate the evolutionary response of clinical isolates to the treatment through experimental evolution. Phenotypic and genomic analyses will be conducted to explore adaptive changes in response to iron deprivation.

This project will involve basic microbiology techniques, dose-response assays, experimental evolution and genomic analysis. For more information or to express your interest, please contact vera.vollenweider@uzh.ch and rolf.kuemmerli@uzh.ch. The starting date is flexible and can be negotiated.

¹Vera Vollenweider, Karoline Rehm, Clara Chepkirui, Manuela Pérez-Berlanga, Magdalini Polymenidou, Jörn Piel, Laurent Bigler, Rolf Kümmerli (2024) **Antimicrobial activity of iron-depriving pyoverdines against human opportunistic pathogens** *eLife* 13:RP92493. <https://doi.org/10.7554/eLife.92493.3>

²Vera Vollenweider, Flavie Roncoroni, Rolf Kümmerli, **Pyoverdine–antibiotic combination treatment: its efficacy and effects on resistance evolution in *Escherichia coli***, *microLife*, Volume 5, 2024, uqae021, <https://doi.org/10.1093/femsmL/uqae021>