# Application of micro-segmented flow for two-dimensional characterization of the combinatorial effect of zinc and copper ions on metal-tolerant Streptomyces strains.

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## Abstract

The cultivation and growth behavior of metal-tolerant strains of Streptomyce acidiscabies E13 and Streptomyces sp. F4 were studied under droplet-based microfluidics conditions. It was shown that the technique of micro segmented flow is well suited for the investigation of dependence of bacterial growth on different concentrations of either single metal ions or combinations of them. This study confirms higher tolerance to Zn than to Cu by our test organism. The highly resolved dose-response curves reflect two transitions between the different growth behaviors, separating initial responses to Cu concentration ranges into those with (a) intense growth, (b) moderate growth, and (c) growth inhibition. For Streptomyces sp. F4, an initial stimulation was shown in the sublethal range of zinc sulfate. Two-dimensional screenings using computer-controlled fluid actuation and in situ micro flow-through fluorimetry reflected a strong growth stimulation of strain F4 by zinc sulfate in the presence of sublethal Cu concentrations. This stimulatory effect on binary mixtures may be useful in providing optimal growth conditions in bioremediation procedures.

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## Themenfelder

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