

Cyanobacteria-microbe interactions influenced by cyanobacterial siderophore: Cyanochelin B

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Siderophores are iron binding secondary metabolites secreted by several microbes, when their internal iron reserves are exhausted, to facilitate siderophore-iron complex uptake via specific membrane transporters. Cyanochelins are recently discovered amphiphilic lipopeptidic siderophores synthesized by cyanobacteria. We successfully elucidated the detailed structure of cyanochelin B using Liquid chromatography–mass spectrometry and Nuclear magnetic resonance and further optimized method of cyanochelin extraction from biomass and supernatant of starved producer culture.

Cyanochelins are photolytic in nature, and this makes cyanochelin ecologically relevant to shape microbial community dynamics. Along with the structure, we also determined the kinetics of photolysis and the prominent fragments formed after lysis. We determined the biological role cyanochelin in artificial co-culture consisting of *Leptolyngbya* sp. NIES-3755 as a cyanochelin producer and *Synechocystis* sp. PCC6803. Alongside, cyanobacteria-rich soil crusts were collected from natural environments and cultured in iron starvation conditions to obtain cyanochelin producers and benefitters. These findings offer us deeper knowledge about a class of cyanobacterial natural products and provide us with a first look into the complexity of cyanochelin-based interactions and suggest that these siderophores could influence community dynamics in nature.

My talk will introduce the concept of microbial interactions by siderophores and then highlight the overall progress done so far with cyanochelin B during my PhD.