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[P2] REGULATION AND DEGRADATION OF SECONDARY METABOLITES IN PSEUDOMONAS PROTEGENS BY SOIL- AND PLANT ASSOCIATED BACTERIA

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Pseudomonas spp. and their secondary metabolites are frequently studied model organisms for biocontrol and have been experimentally or commercially applied as such. We use *P. protegens* to determine how chemical interaction with soil- and plant microbiomes modulate the effective concentration of bioactive secondary metabolites produced by this well-characterized plant-beneficial species. Specifically, we focus on mapping chemical interaction networks and how these interactions modulate both production as well as degradation of biocontrol-relevant secondary metabolites:

We identify and characterize secondary metabolite degradation processes using combinations of LC-MS, GNPS molecular networking, and Imaging Mass spectrometry to track the “fate” of selected metabolites within synthetic communities of soil bacteria. Here, we show that the cyclic lipopeptide orfamide is subjected to complex degradation processes in which multiple bacteria contribute to its complete degradation in a sequential manner. This degradation protects orfamide-sensitive organisms in the community. In relation to regulation, we show that secondary metabolites from both *P. protegens* and soil and plant bacteria can be part of intricate interaction networks in which sequential “back-and-forth” metabolite exchange result in a multitude of changes in levels of secondary metabolites and ultimately modulate biocontrol activities.

Overall, our work demonstrates the importance of identifying chemical interactions between potential biocontrol strains and soil- and plant microbiomes and that strategies to control or mitigate these interactions can determine the activity and efficiency of biocontrol strains.