

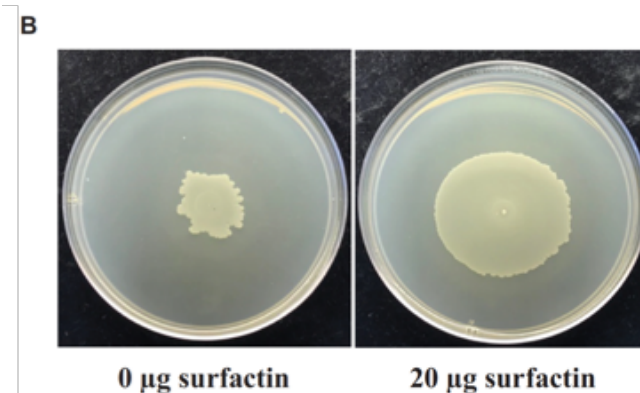
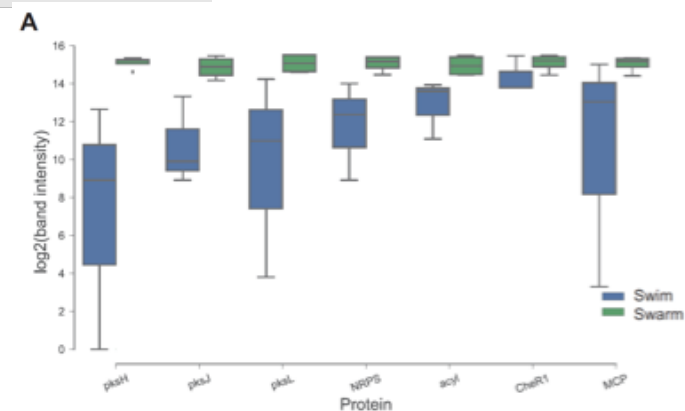
# PMI SFA Publication Highlight

## Novel Approach: Combined integrated lipidomic and proteomic measurements to unravel molecular details of bacterial swarming motility

Objective	<ul style="list-style-type: none"> <li>Use a multi-omics mass spectrometry approach to reveal a detailed, molecular level view of the phospholipids and protein metabolic pathways of a plant-growth promoting microbe during swarming motility</li> </ul>
New science	<ul style="list-style-type: none"> <li>Pathways for lipid production were upregulated in swimming bacteria while lipid degradation was more prevalent in swarming bacteria.</li> <li>Gene operons for the synthesis of lantibiotics, polyketides, and surfactin were upregulated in swarming cells.</li> <li>Distinct differences in membrane phospholipid compositions were observed between swimming and swarming bacteria, with key phospholipid alterations in swarming bacteria, which suggests a remodeling of the cellular membrane.</li> </ul>
Impact	<ul style="list-style-type: none"> <li>This work provides novel molecular targets for manipulating microbial strains of biotechnological importance that may result in faster microbial root colonization and potentially enhanced plant growth.</li> </ul>

### Integrated proteomics and lipidomics reveal that the swarming motility of *Paenibacillus polymyxa* is characterized by phospholipid modification, surfactant deployment, and flagellar specialization relative to swimming motility

Poudel S, Giannone RJ, Farmer AT, Campagna SR, Bible AN, Morrell-Falvey JL, Elkins JG, Hettich RI  
*Frontiers in Microbiology*. 10, 2594. doi: 10.3389/fmicb.2019.02594



Validation of molecular changes in *P. polymyxa* during swarming motility. (A) A quantitative PCR assay was employed to verify that genes involved in polyketide synthesis were upregulated in swarming cells. (B) The pathway for surfactin production is also upregulated in swarming cells. The addition of 20 µg of surfactin to the surface of an agar plate resulted in increased spreading across the surface by the swarming cells.