Pseudomonas fluorescens Induces Strain-Dependent and Strain-Independent Host Plant Responses in Defense Networks, Primary Metabolism, Photosynthesis, and Fitness

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Funding Source: DOE Office of Biological and Environmental Research, Genomic Science Program

Background

• The root-rhizosphere harbors numerous microbial associates that shape host plant performance. The mechanisms mediating these interactions are largely unknown.

Science

• Using Arabidopsis plants as a model, Populus deltoides bacterial isolate GM30 was found to be a plant-growth-promoting rhizobacterium (PGPR) increasing lateral root growth and protecting the plant host against disease.
• Root colonization of Arabidopsis by GM30 elicits a systemic defensive response that was elucidated by network modeling of gene expression and metabolite pathway analysis.

Significance

• This work identifies a specific gene network driving the systemic response in plant-PGPR interactions.
• This work also provides a baseline network for understanding the roles of multiple microbial associates and host plant genotypes.

Weston et al., (Accepted for publication). Molecular Plant-Microbe Interactions, Vol. 25, doi:10.1094/MPMI-09-11-0253