

Metabolic matching as a tool to manage rhizosphere microbiomes for sustainable biofuel production

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Plant exudates are the main drivers of microbial community assembly in rhizosphere

Food for microbes

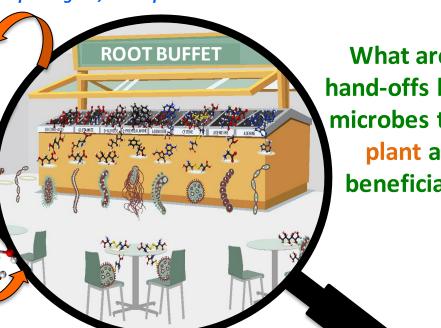


Nutrients (N, P, Fe), defense against pathogens, stress protection

Ecosystem services



- C sequestration
- Biodiversity
- 🖡 GHG



What are the metabolic hand-offs between plants & microbes that help building plant and ecosystem beneficial microbiomes?

Switchgrass microbiome and metabolome response to nutrient and water limitation in marginal soil





Oklahoma

Berkeley, CA

Nameer Baker Mary Firestone Trent Northen Jennifer Pett-Ridge

Microbial community Rhizosphere metabolites Soil properties Data integration

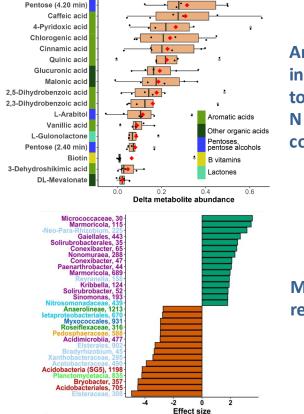
+NP

+P

-\//

+N

Control



Aromatic acids increased in response to N stress N containing compounds decreased

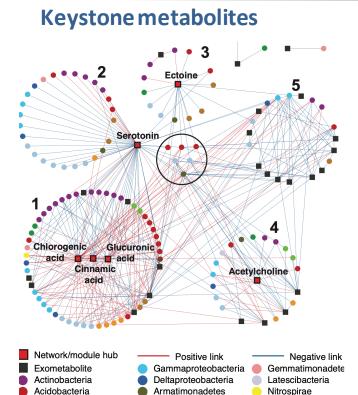
Microbial ASVs responded to N stress

Baker/Zhalnina in prep.

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Connecting the dots: microbiome, metabolome, plant phenotype





Bacteroidetes

Chloroflexi

Planctomycetes

Eurvarchaeota

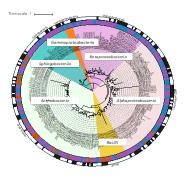
Verrucomicrobia

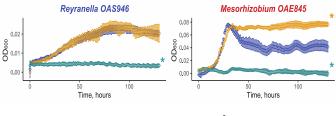
Alphaproteobacteria

Switchgrass response to keystone metabolite

-serotonin +serotonin

Switchgrass isolates response to keystone metabolite







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