Nitrogen limitation and lipid production in *Yarrowia lipolytica*

Erin L. Bredeweg, Kyle R. Pomraning, Ziyu Dai, Scott E. Baker* (scott.baker@pnnl.gov)

Earth and Biological Sciences Directorate, Pacific Northwest National Laboratory, Richland, WA

**Project Goal:** Our goal is to enable rapid engineering of the oleaginous yeast, *Yarrowia lipolytica*, for increased rates of biofuel production.

*Yarrowia lipolytica* is an oleaginous yeast with strong potential as a production host for biofuels and bioproducts. *Yarrowia* produces significant amounts of lipids, including triacylglycerols when nitrogen is a limiting nutrient. We have characterized system level metabolic and regulatory changes that occur upon nitrogen limitation using systems and cell biological approaches. These studies include the development of a green fluorescent protein (GFP) based “cell organelle atlas” to characterize the cellular changes that occur upon nitrogen limitation in *Y. lipolytica*. Genome-wide promoter analysis predicts that the ortholog of the carbon catabolite repression regulator, mig1/cre1/creA, as well as nitrogen responsive GATA transcription factors are key controllers of the cellular response to carbon and nitrogen levels. The research we will present includes a genetic and transcriptome analysis of the GATA transcription factors and their regulatory targets.

**Publications**


*Funding for this research provided by the DOE BER Genome Science Program grant DE-SC0008744.*