

P3-205: “Perception and Modification of Biopolymers by Filamentous Fungi: Towards the Metabolic Engineering of Fungi to Complement Plant-Based Bioproduction Strategies”

Burton Bluhm (PI), Jackson Lay (Co-PI)

Abstract:

Sustainable production of biofuels from plant material is a crucial component of U.S. energy independence. Crops and crop residues provide an important source of raw materials for bioenergy production. For example, bioethanol can be produced by fermenting simple sugars derived from complex plant carbohydrates. However, one of the biggest challenges facing bioethanol production is the development of cost-effective, environmentally-friendly approaches to convert raw plant materials into fermentable sugars. This project is focused on engineering fungi to efficiently convert grain and plant biomass into simple, fermentable sugars. To this end, we are studying how fungi perceive plant-derived carbohydrates and regulate genes involved in carbohydrate digestion. From this information, we will identify signaling pathways and specific genes in fungi that can be modified to increase digestive capacity, which will ultimately lead to the development of fungal strains that can be used in commercial-scale conversion of complex carbohydrates into fermentable sugars.