
# Enabling Technologies
## Lead: Mark Davis
Deputy FA Lead: Erica Gjersing

## 3.1 Characterization of Biomass Features that Enhance Sugar Release
Lead: Art Ragauskas

### 3.1.1 Support for Identification of the TOP Recalcitrant Lines (Gjersing)

TASK: 1. High-throughput cell wall chemistry and recalcitrance screen (Gjersing)

TASK: 2. Biomass analytical window (York)

TASK: 3. Whole-cell wall NMR analysis with emphasis on lignin structure (Ragauskas)

TASK: 4. Small-scale cell wall compositional assay with emphasis on carbohydrates degradation products and inhibitors (Decker)

TASK: 5. Screening for cellulose crystalline, accessibility, and DP (Ragauskas)

### 3.1.2 In-Depth Cell Wall Characterization (Ragauskas)

TASK: 1. Detailed structural analysis of TOP and ELITE reduced-recalcitrance switchgrass and *Populus* lines from FA1 (Ragauskas)

TASK: 2. Characterization of pretreated switchgrass / poplar biomass along with pretreatment hydrolysates (Ragauskas)

TASK: 3. Structural analysis of residues remaining after cellulase/CBP deconstruction of switchgrass and *Populus* (Ragauskas)

TASK: 4. In situ imagery of deconstruction (Himmel)






## 3.2 Omics Platforms for Systems Biology
Lead: Tim Tschaplinski

### 3.2.1 Transcriptomics & Resequencing (Brown)

### 3.2.2 Proteomics (Hettich)

### 3.2.3 Metabolomics (Tschaplinski)

### 3.2.4 Glycome Profiling (Hahn)





## 3.3 Advanced Pretreatment Configuration and Conditions
Lead: Charles Wyman

### 3.3.1 Enhance Understanding of Pretreatment Fundamentals and Control Recalcitrance (Wyman)

### 3.3.2 Integrate, Optimize, and Understand Pretreatment with Advanced Plants (Wyman)

TASK: 1. Response of modified plant materials to dilute acid pretreatment (Davis)

TASK: 2. Response of modified plant materials to dilute ammonia pretreatment (Sanford, Hitz)

### 3.3.3 Define and Validate Advanced Pretreatment Technologies that Remove Biomass Recalcitrance as an Economic Barrier to Biological Process (Wyman)

### 3.3.4 Demonstration of Improved Plants with CBP Organisms (Dumitrache)

TASK: 1. Rapid microbial assessment of changes in metabolic flux in modified CBP organisms (Davison)

TASK: 2. Microbial assays to measure performance of CBP microbes on modified materials (Dumitrache)





## Science Integration
Lead: Brian Davison


## 3.5 Education and Outreach
Lead: Westpheling


## BESC Director's Office


## 4.0 Comp Bio and Data Management
Lead: Gilna

Holladay
Nookaew
Jacobson

Trinh
Xu
Voit
Munch








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