High-Throughput Screening of Wild Type and Engineered Plants using the JBEI Feedstocks-To-Fuels (F2F) Pipeline

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Project goals: Establish the scientific knowledge and new technologies to transform the maximum amount of carbon available in bioenergy crops into biofuels and bioproducts.

Abstract:
Efficient conversion of lignocellulosic biomass into biofuels and bioproducts requires bioengineering of plants, microbes. Biomass is deconstructed using ionic liquids and enzymes, resulting sugars are converted by microbes into desired bioproducts. Testing the saccharification and conversion efficacy of hundreds of transgenic plants, various strains of microbes and Ionic liquids with different possible combinations is a daunting task. Evaluation and identification of best candidate plants, microbes at bench scale are cumbersome and time taking. A high-throughput screening platform (F2F: Feedstocks-To-Fuels) is developed to address these challenges. With end-to-end automated processes combined with machine learning tools the pipeline enables the flexibility to adjust multiple experimental parameters and predictive deconstruction of various biomass samples. Methods and components of the Pipeline and saccharification and fermentation results from screening of wild type and engineered sorghum plants are presented.