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Microfluidic Technology for Biofuels Applications

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We are developing a suite of microfluidic technologies to address the throughput limitations of conventional approaches for biomass analysis. We have developed a microfluidic electrophoretic assay for rapid (< 1 min) and multiplexed analysis of lignocellulosic biomass samples. To address the low throughput of conventional enzyme screening approaches, we have developed a rapid (1-2 hr) integrated microscale platform for cell-free expression and activity analysis of thermophilic cellulases. We have also developed a high-throughput approach for saccharification studies of ionic-liquid pretreated solid biomass. Currently, we are integrating the above technologies to develop optimized cellulase cocktails for cost-effective production of biofuels from lignocellulosic feedstocks.

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