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and Optimization"; ""Deconstruction"; ""Fermentation and Recovery"; ""TECHNOLOGY DEPLOYMENT PHASE (WITHIN 10 YEARS)"; ""Feedstocks"; ""Deconstruction"; ""Fermentation and Recovery"; ""SYSTEMS INTEGRATION PHASE (WITHIN 15 YEARS)"; ""Integration and Consolidation""  
""SYSTEMS BIOLOGY TO OVERCOME BARRIERS TOCELLULOSIC ETHANOL""""LIGNOCELLULOSIC BIOMASS CHARACTERISTICS"";  
""Makeup, Structure, and Processability""; ""IMAGE ANALYSIS OF BIOENERGY PLANT CELL SURFACES AT THEOBP BIOMASS SURFACE CHARACTERIZATION LAB (BSCL)""; ""STRUCTURE AND ASSEMBLY OF CELL WALLS""; ""OPTIMIZING LIGNIN COMPOSITION FOR MORE EFFICIENTBIOETHANOL PRODUCTION""; ""FACTORS IN RECALCITRANCE OF LIGNOCELLULOSEPROCESSING TO SUGARS""; ""Plant Architecture"";  
""Cell-Wall Architecture""; ""Molecular Structure""; ""OPTIMIZING HEMICELLULOSE ACETYLATION IN CELL WALLS""  
""Hemicellulose Acetylation Degradation Products Are Toxic to Microbes""""OPTIMIZATION OF PLANT CELL WALLS""; ""Understanding Cell-Wall Structure and Function""; ""Control of Lignin Synthesis and Structure""; ""IMPROVED METHODS, TOOLS, AND TECHNOLOGIES"";  
""Technical Milestones""; ""Within 5 years""; ""Within 10 years""; ""Within 15 years""; ""CITED REFERENCES""; ""FEEDSTOCKS FOR BIOFUELS""; ""THE ARGUMENT FOR PERENNIAL BIOMASS CROPS""; ""CREATION OF A NEW GENERATION OF LIGNOCELLULOSICENERGY CROPS""; ""Maximizing Biomass Productivity""; ""Domestication of Energy Crops""  
""ENHANCING POPLAR TRAITS FOR ENERGY APPLICATIONS""

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#### Sommario/riassunto

Defines barriers and challenges to a rapid expansion of cellulosic-ethanol production and determine ways to speed solutions through concerted application of modern biology tools as part of a joint research agenda.

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