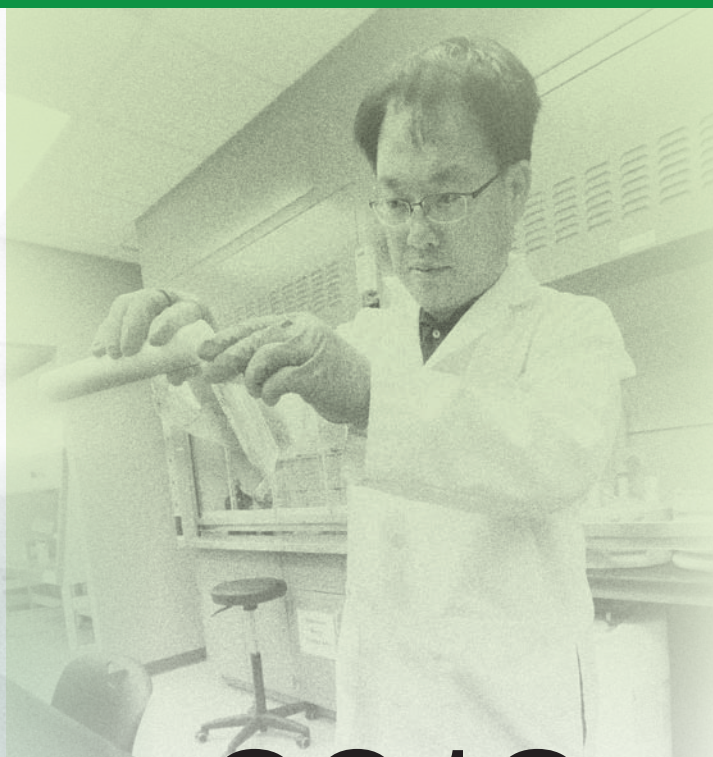
Frontiers in Biorefining

Chemicals and Products from Renewable Carbon



2012 International Conference

St. Simons Island, Georgia, USA

October 30 - November 2

Steering Committee Members

Joseph Bozell
Center for Renewable Carbon
The University of Tennessee

Nicole Labbé
Center for Renewable Carbon
The University of Tennessee

Peter Muller
Perkin-Elmer, Inc.

Timothy Rials
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Program Committee Members

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Maureen McCann
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Oak Ridge National Laboratory

Brent Shanks
Iowa State University

Christian Stevens
Ghent University

Hosted by:

CRC
Center for Renewable Carbon
The University of Tennessee Institute of Agriculture

PerkinElmer

CONFERENCE SCHEDULE

TUESDAY OCTOBER 30, 2012

Registration/Social Hour

5:00-8:00pm

WEDNESDAY OCTOBER 31, 2012

Registration

7:00-7:50am Breakfast and Welcome

Plenary Session:
Biorefinery Concepts for Chemicals and Products

7:50-8:00 **Welcome and Opening Remarks** - **Timothy Rials** (University of Tennessee)

8:00-8:40 **Gregg Beckham** (National Renewable Energy Laboratory – Computational Modeling of Biomass Conversion Systems)

8:40-9:20 **Clint Chapple** (Purdue University – Manipulation of Lignin Biosynthesis in Plants: The Low Hanging Fruit in Feedstock Improvement for the Biorefinery)

9:20-10:00 **Percival Zhang** (Virginia Tech – Innovative Biomanufacturing Platform: Cell-Free Synthetic Pathway Biotransformation)

10:00-10:15am Coffee Break

10:15-10:55 **Gary Peter** (University of Florida – High Terpene Pines: Transforming Existing and Enabling New Forest Biorefineries)

10:55-11:35 **Claus Felby** (University of Copenhagen – Biorefinery Development: The Danish Perspective)

11:35-12:15 **Christian Stevens** (Ghent University – Exploiting Nature's Diversity for the Development of Chemical Building Blocks)

12:15 - 1:30pm Lunch **Timothy G. Rials** (University of Tennessee – Introduction to IBSS, Southeastern Partnership for Integrated Biomass Supply Systems)

WEDNESDAY OCTOBER 31, 2012

Session 2A:
From Pretreatment to Fractionation

1:30-1:55 **Julie Carrier** (University of Arkansas - Biomass into Bioproducts)

1:55-2:20 **Maobing Tu** (Auburn University - Enzymatic Hydrolysis of Ethanol Organosolv Pretreated Loblolly Pine and Sweetgum)

2:20-2:45 **Nancy Nichols** (USDA - National Center for Agricultural Utilization Research - A Biological Approach to Cleaning up Fermentation Inhibitors Present in Biomass Sugars)

2:45-3:10 **John Yarbrough** (National Renewable Energy Laboratory - Understanding Biomass Recalcitrance Using Advanced Imaging)

3:10-3:30pm Coffee Break

3:30-3:55 **Adriaan van Heiningen** (University of Maine - Biobutanol from Forest Residues by SO_2 Ethanol-Water Fractionation and ABE Fermentation)

3:55-4:20 **Scott Renneckar** (Virginia Tech - "Melt-Compounded" Biomass: A Unique Pretreatment for Cellulose Saccharification and Lignin Extraction)

4:20-4:45 **Rashmi Kataria** (Trinity College Dublin - Effect of Surfactants Pre-Treatment on Lignocellulosic Biomass)

Session 2B:
Chemical Catalysis

1:30-1:55 **Evan Beach** (Yale University - Controlled Catalytic Depolymerization of Organosolv Lignin)

1:55-2:20 **Thomas Zawodzinski** (University of Tennessee - Exploring Electrochemical Modifications of Biomass-Derived Components)

2:20-2:45 **James Stambuli** (Ohio State University - Site-Selective Functionalization of Fatty Acid Derivatives)

2:45-3:10 **Michel Delmas** (University of Toulouse - The BBB Process: Biomass to Biofuels and Bioproducts)

3:10-3:30pm Coffee Break

3:30-3:55 **Peter Miedziak** (Cardiff University - The Use of Platinum Alloyed Bimetallic Catalysts to Manipulate Product Distributions During the Oxidation of Polyols)

3:55-4:20 **Doug Hayes** (University of Tennessee - Biobased Surfactants: A Useful Biorefinery Product That Can Be Prepared Using Green Manufacturing)

4:20-4:45 **Sabornie Chatterjee** (Oak Ridge National Laboratory - Preparation and Characterization of Modified Lignin for the Production of Carbon Fibers)

WEDNESDAY OCTOBER 31, 2012

Poster Session

6:30-8:30pm

THURSDAY NOVEMBER 1, 2012

7:30-8:30am Breakfast

Session 3A:

Biocatalytic Conversion

8:30-8:55 **Cong Trinh** (University of Tennessee - Redesigning E.coli Metabolism for Obligate Anaerobic Production of Biofuels and Biochemicals)

8:55-9:20 **Timothy Bugg** (University of Warwick - Bacterial Enzymes for Lignin Degradation and Production of Aromatic Chemicals from Lignocellulose)

9:20-9:45 **Hugh O'Neill** (Oak Ridge National Laboratory - Investigation of Structural Changes in Cel7A Cellulase when Bound to Cellulose Substrates)

9:45-10:10 **Jason Sello** (Brown University - Genetic Engineering of Streptomyces Bacteria as Lignocellulose Biorefineries)

10:10-10:30am Coffee Break

10:30-10:55 **Birgitte Ahring** (Washington State University - Producing Drop-In Hydrocarbon Biofuels from Lignocellulosic Biomass Materials)

10:55-11:20 **Hossein Noureddini** (University of Nebraska Lincoln - Cellulase Production by Solid State Fermentation on Wet Corn Distillers Grains)

11:20-11:45 **Nhuan Nghiem** (USDA - Agricultural Research Service - Integration of Succinic Acid and Ethanol Production in a Biorefinery)

11:45-12:10 **Reeta Davis** (University College Dublin - Conversion of Cellulosic Biomass from Grass into Fermentable Sugars and its Effective Utilization for Biosynthesis of Medium Chain Length Polyhydroxyalkanoates (MCL-PHA) by *Pseudomonas* SPP)

Session 3B:

Advances in Analytical Techniques and Computational Processes

8:30-8:55 **Laurene Tetard** (Oak Ridge National Laboratory - Surface and Subsurface Physical and Chemical Characterization of Soft Materials at the Nanoscale)

8:55-9:20 **Laura Jarboe** (Iowa State University - Enabling Robust Production of Biorenewable Fuels and Chemicals from Biomass)

9:20-9:45 **Hilkka Kenttämaa** (Purdue University - Tandem Mass Spectrometry in the Characterization of Converted Biomass)

9:45-10:10 **Mark Driscoll** (State University of New York - Ionizing Radiation and a Wood-Based Biorefinery)

10:10-10:30am Coffee Break

10:30-10:55 **Thomas Elder** (USDA Forest Service Southern Research Station - Applications of Computational Chemistry to the Reactions of Lignin)

10:55-11:20 **Gnana Gnanakaran** (Los Alamos National Laboratory - Overcoming Recalcitrance of Biobased Feedstocks Through Catalytic Conversions)

11:20-11:45 **Ariana Beste** (University of Tennessee - Lignin Model Pyrolysis: A Computational Approach)

11:45-12:10 **Anis Khimani** (Perkin-Elmer - From Paper Trails to Electronic Management Systems: Green Lining the Biomass Conversion Process)

THURSDAY NOVEMBER 1, 2012

Free Time

THURSDAY NOVEMBER 1, 2012

Social Hour / Conference Dinner and Keynote Speaker

6:00-7:00pm - Social Hour

7:00-9:00pm - Dinner

Guliz Elliott - Chemtex International, Inc. - Lignin Rich Residues from Biomass to Chemicals and Fuels

7:30-8:30am Breakfast

Session 4A:
Chemical Processes

8:30-8:55 **Roberto Rinaldi** (Max-Planck Institute - Solvent-Based Catalytic Strategies for the Selective Hydrogenolysis of Lignin and Selective Defunctionalization of Bio-Oil Under Low-Severity Conditions)

8:55-9:20 **Doug Hendry** (University of Missouri - High Throughput Biomass Conversion in Supercritical Water and Product Separations as an "End of Pipe" Technology in a Biomass Refinery)

9:20-9:45 **David Johnson** (National Renewable Energy Laboratory - Conversion of Sugars to Hydrocarbons via Depolymerization and Decarboxylation of Polyhydroxyalkanoates)

9:45-10:10 **Darren Baker** (University of Tennessee - Carbon Fiber from Engineered Lignin)

10:10-10:30am Coffee Break

10:30-10:55 **Hermine Nsa Moto** (University of Toulouse - Synthesis and Physical Properties of Novel Glycerol-Based Monomers and Polymers from Plant Oils)

10:55-11:20 **Nicole Brown** (Pennsylvania State University - Pyrolysis of Lignin to Create a New Foundry Fuel Source)

11:20-11:45 **Mahdi Abu-Omar** (Purdue University - Cheap and Abundant Catalysts for Biomass Conversion Including Lignin)

Session 4B:
Industrial Processes

8:30-8:55 **Orlando Rojas** (North Carolina State University - New Technologies for Wood Pretreatment within the Concept of the Biorefinery and Novel Uses of Cell Wall Components)

8:55-9:20 **Joseph Bozell** (University of Tennessee - Integrating Separation and Conversion – Conversion of Biorefinery Process Streams to Biobased Chemicals and Fuels)

9:20-9:45 **Hideki Abe** (Tokyo Institute of Technology - Biosynthesis and Characterization of Medium-Chain-Length Poly (3-Hydroxyalkanoates)

9:45-10:10 **Foster Agblevor** (Utah State University - Production of High - Valued Chemicals from Fractional Catalytic Pyrolysis of Biomass)

10:10-10:30am Coffee Break

10:30-10:55 **David Nielsen** (Arizona State University - Engineering Bacteria to Produce Bio-Styrene and Other Aromatic Chemicals)

10:55-11:20 **John Bhatt** (Novasep - Advanced Purification Technologies for your BioBased Chemicals)

11:20-11:45 **Steve Kelley** (North Carolina State University - Development of Supply Chain and Engineering Process Models for Predicting the Financial and Life Cycle Performance Bioenergy Systems)

WEDNESDAY OCTOBER 31, 2012

Poster Session

6:30-8:30pm

Louise Ahl - *University of Copenhagen* - Carbohydrate Microarrays for Measuring Cell Wall Polysaccharides in Relation to Biomass Conversion

Frank Armstead - *Auburn University* - Biomass Characterization and Gasification for Transportation Fuels Production

Anton Astner - *University of Tennessee* - Lignin Yield Maximization of Lignocellulosic Biomass by Taguchi Robust Product Design Using Organosolv Fractionation

Priyanka Bhattacharya - *University of Tennessee* - Screening of Lignins by Pyrolysis-Gas Chromatography/Mass Spectrometry

Christine Bohn - *Purdue University* - Dehydration of Plant Derived Sugars Utilizing Iron (III) and Molybdenum (V) Catalysts in a Biphasic Reaction Medium

Federico Cerrone - *Trinity College Dublin* - Conversion of Anaerobic Digested Grass into PHAs by High Cell Density Fermentation Strategies

William Chaplow - *Auburn University* - Dilute Acid and Organosolv Pretreatment of Loblolly Pine and Sweetgum

Paul Filson - *University of Tennessee* - Investigation of Potential Inhibitors from Switchgrass in Biorefinery

Doug Hayes - *University of Tennessee* - Preparation of Oligo Ricinoleic Acid Derivatives via Lipase-Catalyzed Esterification as Lubricant Additives and Star Polymers for Drug Delivery

Doug Hayes – *University of Tennessee* - Poly (Lactic Acid)/Poly (Hydroxyalkanoate) Nonwovens as Biodegradable Agricultural Mulches

Omid Hosseinaei – *University of Tennessee* - Oxidative Stabilization Studies in the Formation of Electrospun Carhon Nanofibers from a Purified Softwood Kraft Lignin

Tiffany Jarrell – *Purdue University* - Characterization of Organosolv Switchgrass by High Performance Liquid Chromatography/Multiple State Tandem Mass Spectrometry Using Hydroxide-Doped Electrospray Ionization

Pyoungchung Kim - *University of Tennessee* - The Effects of Organosolv Fractionation Process on the Properties of Switchgrass Lignin as a Precursor for Carbon Products

Lindsey Kline - *University of Tennessee* - Activation of Lignocellulosic Biomass in Ionic Liquids

Christopher Marcum - *Purdue University* - A Fundamental Study of the Fragmentation of Small Molecules Related to Lignin via Collision-Activated Dissociation (CAD)

James Riedeman - *Perdue University* - Methods for the Identification of levoglucosan Isomers in Bio Oil Obtained by Fast Pyrolysis of Cellulose

Wei Zhang - *Virginia Tech* - Analysis of Novel Lignin Extracted from "Melt Compounded" Biomass

Kelvin Smith - *Auburn University* - Rapid Characterization and Determination of Wood Chemistry and Crystallinity Index of Loblolly Pine

Jacob Wadkins - *Auburn University* - Flowability of Ground Loblolly Pine

Jeff Wright - *ArborGen Inc.* - Advances in Forest Plantation Systems: Implications for Bioproduct Feedstock

Liana Wuchte - *Auburn University* - Gas-Phase Higher Alcohol Synthesis and Fischer Tropsch Synthesis

Trevor Treasure - *North Carolina State University* - Integrated Process, Financial, and Risk Modeling of Cellulosic Ethanol From Woody and Non-Woody Feedstocks via Dilute Acid Pretreatment

Jennifer Davis - *Brown University* - Study of PcaV from Streptomyces Coelicolor Yields New Insights into Ligand-Responsive MarR Family Transcription Factors

Jesse Daystar - *North Carolina State University* - Integrated Supply Chain Delivered Costs, and Life Cycle Assessment of Several Lignocellulosic Supply Systems for Biofuels, Bioenergy and Bioproducts in the Southern U.S.

Ingrid Hoeger - *North Carolina State University* - Influence of Feedstock Deconstruction in Enzymatic Saccharification of Softwoods

Carlos Salas - *North Carolina State University* - Lignin-Soy Protein Interactions: Electrospun Nanofibers Based on Soy Proteins and Lignin

Julio Arboleda - *North Carolina State University* - Synthesis and Characterization of Novel Soy Protein-Nanocellulose Composite Aerogels