

2018 AOCS Annual Meeting & Expo

May 6–9 | Minneapolis Convention Center | Minneapolis, Minnesota, USA



Biotechnology (BIO) Interest Area Tentative Technical Program

As of January 3, 2018

This presentation list is not final and is subject to change.

The presenter is the first author, or the author indicated with an asterisk ().*

Monday Afternoon

BIO 1: Biocatalysis

Chairs: Jun Ogawa, Kyoto University, Japan; and Ching Hou, USDA, ARS, NCAUR, USA

Biorefinery System for Valuable Lipid Production by Thraustochytrids. Tsunehiro Aki, *Hiroshima University, Japan*

Alteration of Lipase Selectivity by Protein Engineering. Katja Zorn¹, Isabel Oroz-Guinea¹, Henrike Brundiek², and Uwe T. Bornscheuer^{*3}, ¹*Institute of Biochemistry, Germany*; ²*Enzymicals AG, Germany*; ³*University of Greiswald, Germany*

Screening of Fatty Acids Showing Selective Antibacterial Activity Against Acne-associated Propionibacterium acnes. Ayaka Uyama¹, Teizo Sugino¹, Shimemitsu Tanaka², and Toshihiro Nagao^{*2}, ¹*Momotani Juntanken Ltd., Japan*; ²*Osaka Research Institute of Industrial Science and Technology, Japan*

Stearidonic Acid Soybean Oil – Concentration and Enzymatic Modification. Casimir C. Akoh, *University of Georgia, USA*

Challenges to Develop Bioprocess for Lignin Paint. Yomi Watanabe, *Osaka Research Institute of Industrial Science and Technology, Japan*

Efficient Production of MLCT Oils by Lipase Reactions. Yutaro Kataoka, Yoshihiro Ueda, and Hidetaka Uehara, *The Nisshin OilIIO Group, Ltd., Japan*

Identification of Molecular Species of Acylglycerols Containing Hydroxy Fatty Acids of Philippine Wild Edible Mushroom, *Ganoderma lucidum*. Ching T. Hou¹, Jiann-Tsyh Lin², Rich M. Dulay³, and Karen Ray⁴, ¹*USDA, ARS, NCAUR, USA*; ²*WRRC, USDA, USA*; ³*Center for R&D, Central Luzon State University, Philippines*; ⁴*NCAUR, USDA, USA*

Enzymatic Preparation of Medium- and Long-chain Diacylglycerols of High Purity in Combination with Solvent Extraction. Guanghui Li¹, Jiazi Chen¹, Zhen Zhang², Ying Li^{*3}, and Yong Wang⁴, ¹*Dept. of Food Science and Engineering, Jinan University, Guangzhou, China*; ²*South China University of Technology, China*; ³*Guangdong Saskatchewan Oilseed Joint Laboratory, Dept. of Food Science and Engineering, Jinan University, China*; ⁴*Jinan University, China*

Xylose and levulinic acid: Two Inexpensive, Renewable Substrates for the Mixed-culture Biosynthesis of Unique Poly(hydroxyalkanoate) Polymer Blends with Controllable Properties. Richard D. Ashby, Daniel K.Y. Solaiman, and Gary Strahan, *USDA, ARS, ERRC, USA*

Preparation of Diethylhexyl Adipate by Lipase-catalyzed Esterification. In-Hwan Kim¹, TaeHoon Kim¹, Heejin Kim², and Nakyung Choi¹, ¹*Korea University, Republic of Korea*; ²*Dept. of Public Health Sciences, Graduate School, Korea University, Republic of Korea*

Better Understanding of Enzymatic Soy Processing through Modeling Monomeric Sugar Release. S.M. Mahfuzul Islam and Lu-Kwang Ju, *University of Akron, USA*

BIO 1.1 / IOP 1: Biorenewable Polymers

Chairs: Richard Ashby, USDA, ARS, ERRC, USA; and Baki Hazer, Bülent Ecevit University, Turkey

Synthesis of Resinic Acid and Lignin Derivative Dimers for Copolymerization with Vegetable Oil-based Monomers. Audrey Llevot, *LCPO, France*

Dual Cure Alkyds. Mark D. Soucek, *University of Akron, USA*

Reflection of Structural Features of Oils on Properties of Polymeric Materials. Zoran Petrovic, *Pittsburg State University, USA*

Bio-based Oil Potential in Additive Manufacturing. Ivan Javni¹, Olivera Bilic², Jian Hong², Vivek Sharma¹, Xianmei Wan¹, and Jamie M. Messman³, ¹*Pittsburg State University, USA*; ²*Kansas Polymer Research Center/PSU, USA*; ³*Department of Energy's National Security Campus, managed by Honeywell FMT, LLC, USA*

Multifunctional Fatty Acid Macroperoxide Initiators Obtained by the Autoxidation. Synthesis of Block/Graft Copolymers via Free Radical and Ring Opening Polymerization. Baki Hazer, *Bülent Ecevit University, Turkey*

Super Palm Stearin from Enzymatic Directed Interesterification of Palm Oil. Noor Lida Habi Mat Dian¹, Miskandar Mat Sahri¹, Tan Chin Ping², and Lai Oi Ming², ¹*Malaysian Palm Oil Board, Malaysia*; ²*Universiti Putra Malaysia, Malaysia*

Tuesday Morning

BIO 2: Biocatalysis II

Chairs: Lu-Kwang Ju, University of Akron, USA; and Ching Hou, USDA, ARS, NCAUR, USA

BIO 2.1 / H&N 2: Dietary Lipids and the Gut Microbiota

Chairs: Barry Tulk, DuPont Nutrition & Health, USA; and Jun Ogawa, Kyoto University, Japan

Impact of Dietary Fat Intervention on Metabolic Parameter and Gut Microbiota Changes Associated with Obesity and NAFLD. Karmin O, *University of Manitoba, Canada*

Interaction Between Diets and Gut Commensal Bacteria in the Regulation of Immunological Health and Diseases. Jun Kunisawa, *NIBIOHN, Japan*

Efficiency Improvement in the Enzymatic Fractionation of PUFA. Yomi Watanabe¹, Ryosuke Hoshina², Kazumi Katagiri², and Hideaki Kobayashi², ¹*Osaka Research Institute of Industrial Science and Technology, Japan*; ²*Kewpie Corporation, Japan*

BIO 2.2 / PRO 2: Advances in Enzyme Processing Technologies

Chairs: Xuebing Xu, Wilmar Global Research and Development Center, China; and Flavio Galhardo, Bunge Global Innovation, USA

Design and Synthesis of New Lipid Molecules by Assembling Nature Segments for Multi-functionalities. An Enzymatic Solution. Zheng Guo, *Aarhus University, Denmark*

Value and Potential of Phospholipase C Assisted Enzymatic Degumming in Vegetable Oils. Ying Zha¹, Arjen Sein², Steve Gregory³, Greg LeFebvre⁴, and Michael Jung⁵, ¹*DSM, Netherlands*; ²*DSM Biotechnology Center, The Netherlands*; ³*DSM, USA*; ⁴*DSM Food Specialties, Inc, USA*; ⁵*DSM, USA*

Tuesday Afternoon

BIO 3: PUFA Biotechnology

Chairs: Suk Hoo Yoon, Woosuk University, Korea; and Tsunehiro Aki, Hiroshima University, Japan

Lipase-catalyzed Butanolysis of Echium Oil for the Selective Enrichment in Gamma-linolenic and Stearidonic Acids. Marta C. Corzo-Martinez¹, Eduardo López², Luis C. Vazquez¹, Elena Ortego², Erika Olaya², Guillermo Reglero¹, and Carlos Torres^{*1}, ¹*University Autonoma of Madrid, Spain*; ²*Department of Production and Characterization of Novel Foods, Institute of Food Science Research (CIAL,CSIC-UAM), C/ Nicolas Cabrera 9, 28049 Madrid, , Spain*

A New Method for Enzymatic Preparation of Food-Grade Choline Alfoscerate. Byung Hee Kim, *Sookmyung Women's University, Korea*

Lipase-polymer nanoconjugates for biosynthesis in non-aqueous media: Synthesis and Characterization. Bianca Perez¹, Ana Moles², Jannik Pedersen², Steen V. Petersen², Jan Skov S. Pedersen³, Adam Perriman⁴, and Zheng Guo², ¹*Dept. of Engineering, Aarhus University, Denmark*; ²*Aarhus University, Denmark*; ³*Interdisciplinary Nanoscience Center, Aarhus University, Denmark*; ⁴*School of Cellular and Molecular Medicine, Bristol University, UK*

Engineering *Yarrowia lipolytica* for the Production of Fatty Alcohols from Sugars and Fats. Michael Spagnuolo¹, Murtaza Shabbir Hussain¹, and Mark Blenner^{*2}, ¹*Clemson University, United States*; ²*Clemson University, USA*

Extraction and Refining of Lipids Containing Arachidonic Acid from Single Cell Oil, *Mortierella sp.* Suk Hoo Yoon^{*}, *Woosuk University, Korea*

BIO 3.1 / PRO 3.1: Biodiesel

Chairs: Casimir Akoh, University of Georgia, USA; and Per Munk Nielsen, Novozymes, Denmark

Liquid Lipases for Enzymatic Refining: Technical Advantages Beyond Green Technology. Zheng Guo, *Aarhus University, Denmark*

Improving Pre-treatment Efficiency of Oil Feedstock using Adsorbent Filter Aids. David Gittins, Li-Chih Hu, and Nathan Dias^{*}, *Imerys Filtration Minerals Inc., USA*

Improving Pre-treatment Efficiency of Oil Feedstock using Adsorbent Filter Aids.

Online Real-time Quality Control of Biodiesel using Near-Infrared Spectroscopy.

Integrating Conventional and Enzymatic Approaches Towards Industrial Biodiesel Production.

FFA Reduction and Production Control.

Enzymatic Esterification to Handle the FFA in Biodiesel Production.

Wednesday Morning

BIO 4: Plant and Algae Lipid Biotechnology and Genomics

Chairs: Jay Shockey, SRRC-ARS-USDA, USA; and Timothy Durrett, Kansas State University, USA

Genome Editing and Plant Agriculture. Daniel Voytas, *University of Minnesota, USA*

Improving the World's Nutrition with Next Generation Canola Oils. Lorin R. Debonte, Xinmin Deng, Richard Fletcher, Kristin P. Monser-Gray*, Diliara Iassonova, and Willie Loh, *Cargill Inc., USA*

Generation and Characterization of Multiple Mutated Oilseeds via CRISPR Cas9 Genome Editing. Jay Shockey, Catherine Mason, and Tien Thuy Vuong, *USDA, ARS, SRRC, USA*

Molecular Breeding Tools for Rapid Conversion of Cover Crop Pennycress into a Novel Oilseed Crop. Tim Ulmasov, *Arvegenix, USA*

Glycolytic Genes Influences Mesocarp Oil Content in Oil Palm. Jaime Y.S. Low¹, Nurliyana Y.S. Ruzlan², Noor Azizah Musa Musa³, Ai-Ling Ong³, David R. Appleton¹, Fook Tim Chew⁴, Hirzun M. Yusof², and Harikrishna Kulaveerasingam⁵, ¹*Biotechnology & Breeding Department, Sime Darby Plantation R&D Centre, Malaysia;* ²*Sime Darby Renewables, Sime Darby Plantation Sdn Bhd, Malaysia;* ³*Biotechnology & Breeding Department, Sime Darby Plantation R&D Centre;* ⁴*Department of Biological Sciences, National University of Singapore, Singapore;* ⁵*Sime Darby Plantation R&D Centre, Malaysia*

Advancing Genomic Solutions in Algae Biofuels and Bioproducts. Eric R. Moellering, *Synthetic Genomics, Inc., USA*

BIO 4.1 / S&D 4.1: Biosurfactants and Additives

Chairs: Daniel Solaiman, USDA, ARS, ERRC, USA; and George Smith, Huntsman Corporation, USA

Expanding the Commercial Biosurfactant Portfolio: A Journey Guided by the Application of a Rationalized Integrated Bioprocess Design Approach. Lisa Van Renterghem¹, Sophie L.K.W. Roelants¹, Romain Bordes², Niki Baccile³, Karel De Schampelaere⁴, Monica Höfte⁵, Bernd Everaert⁶, Sofie Demaeseneire¹, and Wim Soetaert⁷, ¹*Ghent University, Belgium;* ²*Chalmers University of Technology, Sweden;* ³*Chimie de la Matière Condensée de Paris, Université Pierre et Marie Curie, France;* ⁴*Environmental Toxicology Unit, Ghent University, Belgium;* ⁵*Phytopathology Unit, Ghent University, Belgium;* ⁶*Bio Base Europe Pilot Plant, Belgium;* ⁷*Centre for Industrial Biotechnology and Biocatalysis (InBio.be), Ghent University, Belgium*

Glycolipid Biosurfactants: Characteristic Curvature and Applications in Microemulsions and Emulsions. Zheng Xue, Dennis Parrish, Eric Theiner, Khalil Yacoub, Andras Nagy¹ and Terrence Everson, *Evonik Corporation, USA;*

Glucamide Surfactants: Structural and Interfacial Aspects. Brajesh Jha, *Colgate Palmolive, USA*

NMR Investigation of the Effect of pH on Micelle Formation by an Amino Acid-based Surfactant. Kevin F. Morris¹, Gabriel Rothbauer¹, Elisabeth Rutter¹, Chelsea Reuter-Seng¹, Simon Vera², Eugene Billiot², Yayin Fang³, and Fereshteh Billiot², ¹*Carthage College, USA*; ²*Texas A&M Corpus Christi, USA*; ³*Howard University, USA*

Effects of Rhamnolipid on Phagotrophic Algae as Sensitive Ecologically Important Model Organism. Krutika Invally, Suo Xiao, and Lu-Kwang Ju*, *University of Akron, USA*

Application of Sophorolipids in Control of Food Pathogens. Daniel K.Y. Solaiman, Richard D. Ashby, Xuetong Fan, and Modesto Olanya, *USDA, ARS, ERRC, USA*

The Stability of Nanoemulsions and Emulsions Containing Cinnamaldehyde and Biosurfactants, and their Antimicrobial Performance against Escherichia. coli O157:H7 and Listeria Monocytogenes. Kangzi Ren and Buddhi Lamsal, *Iowa State University, USA*

Wednesday Afternoon

BIO 5: General Biotechnology

Chairs: Byung Hee Kim, Sookmyung Women's University, Korea; and Shigenobu Kishino, Kyoto University, Japan

Effect of Interesterification on the Physicochemical Profiles of Rice Bran Wax-based Modified Fats. Zhen Zhang¹, Huihua Huang², and Yong Wang³, ¹*South China University of Technology, China*; ²*School of Food Science and Engineering, South China University of Technology, China*; ³*Jinan University, China*

Synthesis of 2-docosaheptaenoylethanol by Enzymatic Ethanolysis. Yu Zhang, Xiaosan Wang, Shuo Zou, Qingzhe Jin, and Xingguo Wang, *Jiangnan University, China*

Substrate Preference of Long Chain acyl-CoA Synthetase for Hydroxy-Fatty Acids. Jesse D. Bengtsson, and John Browse, *Washington State University, USA*

Preparation of Diisononyl Adipate via Lipase-catalyzed Esterification in a Solvent-free system. Aree Lee*¹, Heejin Kim², and In-Hwan Kim¹, ¹*Korea University, Republic of Korea*; ²*Dept. of Public Health Sciences, Graduate School, Korea University, Republic of Korea*

Effective Enrichment of Palmitoleic Acid from Seabuckthorn Oil by Combining Different Methods. Nakyung Choi¹, Ju Yeon Chung¹, Heejin Kim², and In-Hwan Kim¹, ¹*Korea University, Republic of Korea*; ²*Dept. of Public Health Sciences, Graduate School, Korea University, Republic of Korea*

Enzymatic Processing Methods to Reduce Saturated Fat Content of Oils. Matthew A. Robinson, *Dow AgroSciences, USA*

BIO-P: Biotechnology Poster Session

Chairs: Byung Hee Kim, Sookmyung Women's University, Korea; and Shigenobu Kishino, Kyoto University, Japan

Posters will be available for viewing from noon on Monday, May 7 through 2:00 p.m. Wednesday, May 9, 2018.

Sequential Liquefaction of *Nicotiana tabacum* Stems Biomass by Crude Polyhydric Alcohols for the Production of Polyols and Rigid Polyurethane Foams. Chiragkumar M. Patel, *Industrial Chemistry Dept., V. P. & R. P. T. P. Science College, India*

Dendritic Nanomolecules as Drug Carriers: Solubilization, Sustained Release and Biocompatibility Study.

Ravindra V. Movliya and Pravinkumar M. Patel, *V. P. & R. P. T. P. Sc. College, India*

An Effective Method for Deacidification of High-acid Rice Bran Oil by Enzymatic Amidation. Xingguo Wang and

Xiaosan Wang*, *Jiangnan University, China*