



2019 AOCs Annual Meeting & Expo

May 5–8 America's Center Convention Complex | St. Louis, Missouri, USA

Biotechnology (BIO) Interest Area Tentative Technical Program

As of February 12, 2019

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 I—Oleochemicals and Novel Bioprocesses

Chairs: Ching Hou, Retired USDA, USA; and Jun Ogawa, Div. Appl. Life Sci., Grad. Sch. Agric., Kyoto University, Japan

Harnessing the Oil Palm Genome for Enhancing Fatty Acid and Carotenoid Composition.

Rajinder Singh*, Eng-Ti Leslie Low, Meilina Ong-Abdullah, Mohd Din Amiruddin, Mohamad Arif Abd Manaf, and Ghulam Kadir Ahmad Parveez, *Malaysian Palm Oil Board, Malaysia*

Production of Palmitoleic Acid-rich Triacylglycerols by *Saccharomyces cerevisiae* to Control of Skin Microbiome. Toshihiro Nagao*¹, Kazue Narihiro², Shimemitsu Tanaka¹, Kazuyoshi Kimura³, Kazuhiro Yamashita², and Yasushi Kamisaka⁴, ¹*Osaka Research Institute of Industrial Science and Technology, Japan*; ²*YAEAGAKI Bio-industry, Inc., Japan*; ³*National Institute of Advanced Industrial Science and Technology, Japan*; ⁴*Bioproduction Research Institute, AIST, Japan*

Molecular Breeding and Characterization of an Oleaginous fungus *Mortierella alpina* for a Prostaglandin, PGF_{2α}, Production. Jun Ogawa*¹, Mohd Fazli Farida Asras², Hideaki Nagano², Yoshimi Shimada², Miho Takemura³, Shigenobu Kishino⁴, and Akinori Ando², ¹*Div. Appl. Life Sci., Grad. Sch. Agric., Kyoto University, Japan*; ²*Div. Appl. Life Sci., Grad. Sch. Agric., Kyoto Univ., Japan*; ³*Res. Ins. Biore. Biotech., Ishikawa Pref. Univ., Japan*; ⁴*Kyoto University, Japan*

Co-production of Carotenoids and Polyhydroxyalkanoates by *Paracoccus* sp. LL1. Beom Soo Kim*¹, Prasun Kumar², Won-Gyun Oh², and Mehtab Muhammad², ¹*Chungbuk National University, Republic of Korea*; ²*Chungbuk National University, South Korea*

Gas-to-Lipids Bioprocessing by Acetogens and Thraustochytrids. Charose MT Perez¹, Ran Hirotsu¹, Motomu Ishigaki¹, Kenshi Watanabe¹, Yoshiko Okamura¹, Takahisa Tajima¹, Yukihiro Matsumura¹, Yutaka Nakashimada¹, Yusuke Sumita², Shinzo Mayuzumi³, and Tsunehiro Aki*¹, ¹*Hiroshima University, Japan*; ²*Chugoku Electric Power, Japan*; ³*Idemitsu Kosan, Japan*

Hydrolysis of Raffinose in Complex Soybean Waste by Engineered *P. chlororaphis* as Biocatalyst. Daniel K.Y Solaiman*, Richard D. Ashby, and Nicole V. Crocker, *USDA, ARS, ERRC, USA*

Synthesis of Trimethylolpropane Triester Using an Immobilized Lipase in a Recirculated Packed Bed Reactor. Heejin Kim¹, and In-Hwan Kim*², ¹*Dept. of Public Health Sciences, Graduate School, Korea University, Republic of Korea;* ²*Korea University, Republic of Korea*

BIO 1.1 / IOP 1: Biopolymers

Chairs: Rongpeng Wang, CVC Thermoset Specialties, USA; and Richard Ashby, USDA, ARS, ERRC, USA

Plant Oil Derived Emulsion Copolymers with Predictable Properties. Meghan E. Lamm*, Ping Li, and Chuanbing Tang, *University of South Carolina, USA*

Corn Oil for Highly Flame Retardant Rigid Polyurethane Foams for Industrial Applications. Camila Zequine, Sanket Bhojate, Brooks Neria, Pawan Kahol, and Ram Gupta*, *Pittsburg State University, USA*

Rapid Conversion of Oils into Various Monomers and Biopolymers. Aman Ullah*, Muhammad Arshad, Reza Ahmadi, and Liejiang Jin, *University of Alberta, Canada*

Cationic Polymerization of Epoxidized Oils to Cast Resins and Foams. Zoran Petrovic*, and Dragana Radojicic, *Pittsburg State University, USA*

Synthesis, Properties and Structure Function Correlation of Bioplasticizers in PVC. Dharma R. Kodali*, and Lucas J. Stolp, *University of Minnesota, USA*

Synthesis and Characterization of Lipid-based Biopolymers and Bionanocomposites from Poultry Industry By-product. Muhammad Safder*, *University of Alberta, Canada*

Corn Stover and Levulinic Acid: Two Valuable, Renewable Substrates for Biosynthesis of Unique Polyhydroxyalkanoate Biopolymers. Richard D. Ashby*, Daniel K.Y. Solaiman, Gary Strahan, and Alberto Nunez, *USDA, ARS, ERRC, USA*

Microalgae for the Production of Novel Biopolymer Feedstocks. Scott Franklin*¹, Zoran Petrovic², Jian Hong³, Leon Parker⁴, Lauren Slutzky⁴, Mona Correa⁴, Nina P. Reyes⁵, Constantine Athanasiadis⁴, Jon Wittenberg⁴, Estelle Schaefer⁶, and Kevin Ward, ¹*Checkerspot, US;* ²*Pittsburg State University, USA;* ³*Kansas Polymer Research Center, Pittsburg State University, USA;* ⁴*Checkerspot;* ⁵*Checkerspot, Inc., USA;* ⁶*Checkerspot, France*

BIO 1.2a/PRO 1a: Advances in Enzyme Processing Technologies

Chairs: Long Zou, Bunge Oils, USA; and Leslie Kleiner, Roquette Americas Inc., USA

Enzyme Assisted Chemical Refining of Vegetable Oils. Sambasivarao P. Javadi*, Sandeep Chaudhary, Melkita P. Sequeira, and Archana P. Ashok, *Shirdi Sai Nutraceuticals Pvt. Ltd., India*

Kinetic Modelling of Enzymatic Saccharification of Soy Molasses. Ashwin Sancheti*, and Lu-Kwang Ju, *University of Akron, USA*

New Enzymatic Process Improves the Yield in Alkaline Refining of Vegetable Oils. Hans Christian Holm¹, and Per Munk Nielsen*, *Novozymes A/S, Denmark*

Unique Phospholipase Degumming Enzyme. Michael E. Spampinato*, *DSM Inc., USA*

Tuesday Morning

BIO 2: Biocatalysis II—Functional Foods and Natural and Derived Oleo-materials

Chairs: Lu-Kwang Ju, University of Akron, USA; and Masashi Hosokawa, Hokkaido University, Japan

Restructuring Lipids for Functionality and Health. Casimir C. Akoh*, *University of Georgia, USA*

Improvement in enzymatic enrichment of DHA in algal lipids by thermostable lipase preparation.. Yomi Watanabe*¹, Tsunehiro Aki², and Araki Masuyama³, ¹*Osaka Research Institute of Industrial Science and Technology, Japan;* ²*Hiroshima University, Japan;* ³*Osaka Institute of Technology, Japan*

Interesterification of Palm Based Oils for Specialty Fat Hardstock: Comparison of Enzymatic Catalysis and Chemical Catalysis. Jing Ye¹, Zhen Zhang², Ying Li³, and Yong Wang*¹, ¹*Jinan University, China;* ²*South China University of Technology, China;* ³*Guangdong Saskatchewan Oilseed Joint Laboratory, Dept. of Food Science and Engineering, Jinan University, China*

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

Synthesis of triacylglycerol containing hydroxy fatty acids as a constituent fatty acid. Shigenobu Kishino*¹, Daichi Toyama¹, and Jun Ogawa², ¹*Kyoto University, Japan;* ²*Div. Appl. Life Sci., Grad. Sch. Agric., Kyoto University, Japan*

Production of xanthophylls by New Zealand Microalgae and the Sea Urchin *Evechinus chloroticus* (Kina). Donato Romanazzi*¹, Johnathon Puddick¹, Masashi Hosokawa², Matthew R. Miller³, Michael Packer, Serean Adams¹, Ruihana Paenga⁴, and Sarah Bond⁵, ¹*Cawthron Institute, New Zealand;* ²*Hokkaido University, Japan;* ³*Cawthron, New Zealand;* ⁴*Hikarangi Bioactives Limited, New Zealand;* ⁵*Massey University*

Production of ω 3-docosapentaenoic Acid (DPA) by *Aurantiochytrium* sp. T7 Strain. Akinori Ando*¹, Ayami Hatano², Tomoyo Okuda¹, Hiroshi Kikukawa³, Keisuke Matsuyama⁴, and Jun Ogawa⁵, ¹*Div. Appl. Life Sci., Grad. Sch. Agric., Kyoto Univ., Japan;* ²*Div. Appl. Life Sci., Grad. Sch. Agric., Kyoto Univ., Japan;* ³*Gifu university, Japan;* ⁴*NAGASE & CO., LTD., Japan;* ⁵*Div. Appl. Life Sci., Grad. Sch. Agric., Kyoto University, Japan*

PUFA Enriched PG Synthesized by PLD-mediated Transphosphatidylation Exerts Anti-inflammatory Effect upon LPS-stimulated RAW264.7 Cells. Liping Chen*¹, Masashi Hosokawa², and Kazuo Miyashita², ¹*Hokkaido University Faculty of Fisheries Sciences, Japan;* ²*Hokkaido University, Japan*

A New Enzymatic Preparation Method for L- α -Glycerolphosphorylcholine for Use as a Food-Grade Cognitive Enhancer. Byung Hee Kim*, *Sookmyung Women's University, Korea*

Roles of Conjugated Linoleic Acids in Oxidation of Vegetable Oils as Functional Lipids. Suk Hoo Yoon*, *Woosuk University, Korea*

Improved Carbohydrase Production by *Aspergillus niger* Fermentation for Soybean Meal Carbohydrate Hydrolysis for use as Fermentation Feedstock. S.M. Mahfuzul Islam*¹, and Lu-Kwang Ju², ¹*The University of Akron, USA;* ²*University of Akron, USA*

Tuesday Afternoon

BIO 3: Plant and Algae Lipid Biotechnology and Genomics

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

USDA Approach to Regulating Plant Breeding Innovation. Neil E. Hoffman*, *USDA/APHIS, USA*

Chemical jolt to increase storage lipid in microalgae. Concetta C. DiRusso*, and Nishikant Wase, *University of Nebraska-Lincoln, USA*

Developing Healthier Oils and Other Food Ingredients through Genome Editing. Javier Gil Humanes*, *Calyxt, Inc, USA*

CoverCress – a Novel Oilseed Winter Crop with Canola-like Composition that Helps to Prevent Soil Erosion. Tim Ulmasov*, *Arvegenix, USA*

Getting the Most Value Out of Soybeans: A Case for Understanding Resource Partitioning and Allocation Over Seed Development. Shrikaar Kambhampati*¹, Jose A. Aznar-Moreno², Jennifer J. Arp¹, Sally K. Bailey¹, Kevin L. Chu³, Timothy P. Durrett², and Doug K. Allen⁴, ¹*Donald Danforth Plant Science Center, USA*; ²*Kansas State University, USA*; ³*Donald Danforth Plant Science Center, USA*; ⁴*Agricultural Research Service, U.S. Department of Agriculture / Donald Danforth Plant Science Center, USA*

The interaction of the soybean seed high oleic acid oil trait with other quality traits. Kristin Bilyeu*, *USDA/ARS, USA*

Development of Strategies for Modification of Seed Oil Formation. Randall J. Weselake*, *Department of Agricultural, Food and Nutritional Science/University of Alberta, Canada*

Repurposing Carbon in Plant Leaves for Enhanced Agricultural Productivity. Doug K. Allen*¹, Kevin Chu², Lauren Jenkins³, and Shrikaar Kambhampati², ¹*Agricultural Research Service, U.S. Department of Agriculture / Donald Danforth Plant Science Center, USA*; ²*Donald Danforth Plant Science Center, USA*; ³*USDA-ARS, USA*

BIO 3.1 / IOP 3 / PRO 3.1: Biofuels

Chairs: Frank Dumeignil, Lille University, France; Xiaofei P. Ye, University of Tennessee, USA; and Megan Hums, USDA, ARS, ERRC, USA

An Innovative Lipid Extraction Process from Spent Coffee Grounds. Mingming Lu*¹, Yang Liu, and Gerhard Knothe², ¹*Univ of Cincinnati, USA*; ²*USDA, ARS, NCAUR, USA*

Modulating the Solubility of Saturated Monoglycerides (SMG) and Glycerol (GLY) in Blended Biodiesel Fuels. Richard W. Heiden*¹, and Martin Mittelbach², ¹*R.W. Heiden Associates, LLC, USA*; ²*Institute of Chemistry, University of Graz, Austria*

Co-production of Acrylic Acid in a Typical Biodiesel Plant: A Techno-Economic Assessment. Xiaofei P. Ye*, *University of Tennessee, USA*

The Use of Controlled Flow Cavitation to Improve the Performance of Degumming, Refining and Biodiesel Operations. Darren J. Litle*, *Arisdyne Systems, Inc., USA*

Wednesday Morning

BIO 4: General Biotechnology: Novel Lipids and Proteins

Chairs: Zheng Guo, Aarhus University, Denmark; and Long Zou, Bunge Oils, USA

Session details pending.

BIO 4.1 / S&D 4: Biosurfactants and Environmentally Friendly Ingredients

Chairs: Sujan Singh, Arkema, USA; and Douglas Hayes, University of Tennessee, USA

Comparative Antimicrobial Efficiency Among C18 and C22 Sophorolipid Congeners towards Select Gram+ Bacterial Strains. Richard D. Ashby*, and Daniel K.Y Solaiman, *USDA, ARS, ERRC, USA*

Fatty Acid, Methyl Ester and Vegetable Oil Ethoxylates. George A. Smith*, *Sasol North America, USA*

How Biosurfactants Can Enable Degreasing. J. R. Bennett¹, Eric Theiner*¹, and Stephanie Hackney², ¹*Evonik Corporation, USA*; ²*Evonik Corporation, USA*

Biodegradable Dispersants for Phosphate Free Automatic Dishwashing Detergents. Scott A. Backer*¹, Severine S. Ferrieux², Eric P. Wasserman¹, Paul P. Mercado¹, Randara Pulukkody³, Anurima Singh⁴, Lin Wang, Ken Laughlin⁴, Steve Arturo⁴, and Lu Bai⁴, ¹*The Dow Chemical Company, USA*; ²*The Dow Chemical Company, France*; ³*Dow Chemical Company, USA*; ⁴*Dow Chemical*

Microbial Glycolipid Biosurfactants: Understanding Self-assembly to Make Soft Functional Materials. Ghazi Ben Messaoud¹, Chris V. Stevens², Lisa Van Renterghem³, Sophie LKW Roelants⁴, Wim Soetaert⁵, and Niki Baccile*⁶, ¹*Sorbonne Université, France*; ²*University of Ghent, Belgium*; ³*Ghent University, Belgium*; ⁴*Bio Base Europe Pilot Plant, Belgium*; ⁵*Centre for Industrial Biotechnology and Biocatalysis (InBio.be), Ghent University, Belgium*; ⁶*Chimie de la Matière Condensée de Paris, Université Pierre et Marie Curie, France*

Aspartic Acid-based Ampholytic Amphiphiles: Synthesis, Characterization, and pH-Dependent Properties at Air/Water and Oil/Water Interface. Weiwei Cheng¹, Sampson Anankanbil², Liu Guoqin³, and Zheng Guo*⁴, ¹*South China University of Technology, China*; ²*Dept. of Engineering, Aarhus University, Denmark*; ³*School of Food Science and Engineering, South China University of Technology, China*; ⁴*Aarhus University, Denmark*

Biobased Surfactants: An Overview. Douglas G. Hayes*, *University of Tennessee, USA*

The combined effects of soap and sophorolipids in the development of mild body wash for sensitive skin. Glen Lelyn Quan*¹, Chie Matsubara¹, Yoshihiko Hirata², Satoshi Yoshida¹, Maiko Iwai¹, Shinji Hamaguchi¹, Etsuko Komiyama, and Shigaku Ikeda, ¹*Saraya Co., Ltd. , Japan*; ²*Saraya, Japan*

Laundry Sustainability vs. Laundry Sanitization: The Tension and the Solutions. Nancy Falk*, *Clorox, USA*

Optimal Regulation of Oxygenation for Coordination of Rhamnolipid Productivities and Residual Fatty Acid Content in Fermentation of *Pseudomonas aeruginosa*. Qin Meng*,
Zhejiang University

Greener and Milder Functionalized Sugar-Based Surfactants for Home Care and Industrial Applications. Robert J. Coots*¹, Dennis Abbeduto², and Andy Sun³, ¹*Colonial Chemical, USA*;
²*Colonial Chemical, Inc., USA*; ³*Colonial Chemical, Inc., USA*

Posters will be available for viewing from Monday at 10:00 a.m. until Wednesday at 1:00 pm.

BIO-P: Biotechnology Poster Session

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

Specialized Lysophosphatidic Acid Acyltransferases Contribute to Unusual Fatty Acid Accumulation in Exotic Euphorbiaceae Seed Oils. Jay Shockey*, *SRRC-ARS-USDA, USA*

Preparation of Oleogel from Sunflower Wax and a Vegetable Oil in a Packed Bed Reactor via Lipase-Catalyzed Interesterification. Jihyun Kim*¹, Nakyung Choi¹, Heejin Kim², Hong-Sik Hwang³, Byung Hee Kim⁴, Phyrim Lee⁵, and In-Hwan Kim⁶, ¹*Korea University, South Korea*; ²*Dept. of Public Health Sciences, Graduate School, Korea University, Republic of Korea*; ³*USDA, ARS, NCAUR, USA*; ⁴*Sookmyung Women's University, Korea*; ⁵*Department of Integrated Biomedical and Life Science, Graduate School, Korea University, South Korea*; ⁶*Korea University, Republic of Korea*

Enhancing acetyl-TAG synthesis through metabolic engineering of the oilseed crop *Camelina sativa*. Timothy P. Durrett*¹, Linah Alkotami², and Catherine Kornacki², ¹*Kansas State University, USA*; ²*Kansas State University, United States*

Chemical composition of a human milk fat substitute produced by enzymatic interesterification. Roberta Claro da Silva¹, Rafaela Airoidi*², Juliana N.R Ract³, Iván Jachmanián⁴, Heather L. Colleran⁵, Salam A. Ibrahim, and Luiz A. Gioielli³, ¹*North Carolina A&T University, United States*; ²*Sao Paulo University, Brazil*; ³*University of Sao Paulo, Brazil*; ⁴*UdeLaR, Uruguay*; ⁵*North Carolina A&T State University, United States*

Modification of Alkyl chain length composition of microalgae *Nannochloropsis*. Taturou Ozaki, Shinji Sugihara*, Mayumi Wada, Akihito Kawahara, Takeshi Saito, and Yasushi Takimura, *Kao corporation, Japan*

Modeling and Optimization of Lipase-Catalyzed Hydrolysis of Phosphatidylcholine Using Response Surface Methodology for L- α -Glycerolphosphorylcholine Production. Yejin Song*¹, Soo Jeong Lee¹, Jung Eun Lee², Eunji Choi², and Byung Hee Kim³, ¹*Sookmyung Women's University, South Korea*; ²*Sookmyung Women's University, Republic of Korea*; ³*Sookmyung Women's University, Korea*

Characterizing Monosaccharides and Starches in a Co-Culture of Microalgae. Chelsea M. Tyus*, Zhimin Xu, Maria Teresa Gutierrez-Wing, JeeWon Koh, and Joan King, *Louisiana State University, United States*

Solvent Fractionation Method for Preparing Pinolenic Acid Concentrates from Pine Nut Oil Fatty Acids. Min-Yu Chung¹, In-Hwan Kim², and Byung Hee Kim*³, ¹*Korea Food Research Institute, South Korea*; ²*Korea University, Republic of Korea*; ³*Sookmyung Women's University, Korea*

Optimize the Astaxanthin Production Platform by Using Optima Cultural Condition Analysis of *Chlorella. sp.* DT and the Transgenic Approach. Wei-Tin Lin¹, Yi-Ting Kou², Cheng-Huan Liu², Wei-Ting Lin², and Yu-Ting Chen*², ¹*Institute of Genomics and Bioinformatics, National Chung Hsing University, Taiwan*; ²*Institute of Genomics and Bioinformatics, National Chung Hsing University, Taiwan*

Characterization of Central Carbon Metabolism in High Oil Tobacco Lines Over Development. Kevin L. Chu*¹, Lauren Jenkins², Sally K. Bailey³, Shrikaar Kambhampati³, Philip Bates⁴, and Doug K. Allen⁵, ¹*Donald Danforth Plant Science Center, USA*; ²*USDA-ARS, United States*; ³*Donald Danforth Plant Science Center, United States*; ⁴*Washington State University, United States*; ⁵*Agricultural Research Service, U.S. Department of Agriculture / Donald Danforth Plant Science Center, USA*

Absolute Quantification of Acyl-ACPs by Mass Spectrometry. Lauren M. Jenkins*¹, Bradley S. Evans², and Doug K. Allen³, ¹*USDA/Donald Danforth Plant Science Center, United States*; ²*Donald Danforth Plant Science Center, United States*; ³*Agricultural Research Service, U.S. Department of Agriculture / Donald Danforth Plant Science Center, USA*

Modeling Pulse/Pulse-Chase Radiolabeling to Assess Lipid Metabolism. Doug K. Allen*¹, and Philip Bates², ¹*Agricultural Research Service, U.S. Department of Agriculture / Donald Danforth Plant Science Center, USA*; ²*Washington State University, United States*

Carbon Partitioning in *Chlamydomonas reinhardtii* under Autotrophic and Mixotrophic Conditions for Growth and Biomass Production. Kevin P. Foley*¹, Zoe Perrine², James Umen², and Doug K. Allen³, ¹*Donald Danforth Plant Science Center, United States*; ²*Donald Danforth Plant Science Center, United States*; ³*Agricultural Research Service, U.S. Department of Agriculture / Donald Danforth Plant Science Center, USA*

Wednesday Afternoon

AOCS Member + Volunteers Appreciation Luncheon

12:30–2 p.m.

Complimentary with all meeting registration types.

“Meet Me in St. Louis” Afternoon Excursion

3–7 p.m.

Departs from the Marriott Grand

Optional event. Ticket purchase is required.