



11th International Symposium on Biocatalysis and Agricultural Biotechnology

Banff Centre – Banff, Alberta, Canada

September 13 to 16, 2015

Meeting Program

Notes to presenters:

Please ensure your presentation (MS PowerPoint format) is loaded onto the session computer at the beginning of the break immediately before your talk. Assistance will be provided.

All talks (other than Keynote Presentations) have been allotted a time slot of 20 minutes in total. Please respect the time limits and aim for a presentation duration of 15 to 17 minutes to allow for a few minutes of questions and discussion. Session Co-Chairs are advised to take necessary steps to ensure speakers and sessions remain on time.

Sunday, September 13

5:00 p.m. to 9:30 p.m. **Registration – Max Bell Foyer, Banff Centre**

6:30 p.m. to 9:30 p.m. **Opening Mixer at Max Bell Foyer / Elder Tom Crane Bear Room**

Monday, September 14

7:00 a.m. to 8:00 a.m. **Registration**

8:10 a.m. to 8:30 a.m. **Opening Remarks and Fellow Award (MB Auditorium)**

8:30 a.m. to 10:00 a.m. **Keynote Presentations (MB Auditorium) – Chair: Randall Weselake**

From the oceans to the fields – Producing wax esters in plants (Ivo Feussner)

Arabidopsis acyl-CoA-binding proteins confer protection against biotic and abiotic stresses (Mee-Len Chye)

10:00 a.m. to 10:30 a.m. **Networking Break**



10:30 a.m. to 12:10 p.m.

Biocatalysis I (MB 251) – Co-Chairs: Brent Selinger and Andrew H.-J. Wang

How structural biology helps understand the functions of proteins from tomato, coral and Arabidopsis (Andrew H.-J. Wang)

Novel recombinant chlorophyllases and biotechnological applications (Jei-Fu Shaw)

Is phytase A from *Myxococcus stipitatus* involved in scavenging phosphate? (Brent Selinger)

Engineering of fatty acid desaturases (Iva Pichova)

Plant acyl-lipid thioesterases producing medium chain (C6-C16) fatty acids and beta-keto fatty acids (Owen Rowland)

Nutraceuticals and Food Biotechnology I (MB 252) – Co-Chairs: Catherine J. Field and Teru Yanagita

Understanding the bioavailability of glycated collagen peptides in human intestinal caco-2 cell culture (Abhishek Bhattacharjee)

Bioactive lipids and the prevention of fatty liver and inflammation (Teru Yanagita)

Microencapsulation of stearidonic acid soybean oil in complex coacervates and stability in yogurt (Casimir C. Akoh)

The anti-cancer potential of the lesser consumed fatty acids (Catherine J. Field)

Intake of n-3 polyunsaturated fatty acid prevents ischemic injuries through neovasculogenesis (Feng-Yao Tang)

Plant Biotechnology I (MB Auditorium) – Co-Chairs: Richard M. Bostock and Sheau-Fang Hwang

Eicosapolyenic acids and β -glucans in pattern-triggered immunity in plant-oomycete interactions (Richard M. Bostock)

Eicosapolyenoic fatty acids induce plant defense responses to *Phytophthora capsici* and alter oxylipin metabolism in tomato and pepper (Sara M. Robinson)

Host resistance to *Plasmodiophora brassicae* and virulence in the pathogen (Sheau-Fang Hwang)

Antibiotic activity of the stone fruit pathogen *Monolinia fructicola*: characterization and identification (Miin-Huey Lee)

Enhancing quality, and probing regulation of essential metabolism in lavandins (Soheil Mahmoud)

12:10 p.m. to 1:30 p.m.

Lunch (Vistas Restaurant)

1:30 p.m. to 3:00 p.m.

Keynote Presentations (MB Auditorium) – Chair: Casimir Akoh

Thinking small to define a big future (Carlo D. Montemagno)

Towards advanced bio-manufacturing – designer microbes and systems for biosynthetic cascade reactions (Claudia Schmidt-Dannert)



3:00 p.m. to 3:40 p.m.

Group Photograph and Networking Break

3:40 p.m. to 6:00 p.m.

Biofuels, Bioproducts and Bioconversions I (MB 251) – Co-Chairs: David C. Bressler and Milan Čertík

An introduction to Canada's BioFuelNet and an overview of national biomass feedstock potentials (J. Kevin Vessey)

High temperature conversion of unusual lipid sources to hydrocarbons (David C. Bressler)

Characterization and engineering of multi-functional enzymes for cellulose/hemicellulose degradation (Po-Huang Liang)

Potential DGAT enzymes for engineering and application of microbial oils (Milan Čertík)

Bioconversion of marine biomass for production of valuable lipids (Tsunehiro Aki)

Methanotrophic bacteria for biofiltration and bioconversion applications in Alberta (Peter F. Dunfield)

Epigenetics (MB 252) – Co-Chairs: Carolyn Fitzsimmons and Igor Kovalchuk

Transgenerational epigenetic programming of preterm birth risk and adverse health outcomes (Gerlinde A.S. Metz)

Epigenetics approaches to agricultural biotechnology (Igor Kovalchuk)

Epigenetics of cancer treatment responses (Olga Kovalchuk)

Epigenetic regulation of cancer stem cell associated phenotypes (Lynne-Marie Postovit)

Neurogenin 2 proneural activity is regulated by the polycomb protein MBT1 in cortical progenitors (Carol Schuurmans)

RFI and pre-natal nutrition of the pregnant heifer: impacts on bull calf scrotal circumference and body weight (Carolyn Fitzsimmons)

AgING: A new epigenetic model for studying cell senescence (Karl Riabowol)

Plant Biotechnology II (MB Auditorium) – Co-Chairs: Bernard Grodzinski and John E. Thompson

Eukaryotic translation initiation factor 5A, a promising target for engineering enhancement of agronomic traits (John E. Thompson)

Soybean somatic embryos and plastids as a model for green seed lipid metabolism (Salvatore A. Sparace)

Partially suppressed, mitochondrial pyruvate dehydrogenase kinase expression can enhance photosynthesis of the inflorescence canopy and increase seed oil production in *Arabidopsis thaliana* at ambient and elevated CO₂ (Bernard Grodzinski)

Glycerol-3-phosphate acyltransferase 9 (GPAT9) contributes to glycerolipid biosynthesis in various tissues of *Arabidopsis thaliana* (Stacy D. Singer)

Development of bioactive oils enriched in punicic acid (Elzbieta Mietkiewska)

Unlocking the mystery of natural rubber biosynthesis in lettuce (*Lactuca sativa*) (Dae-Kyun Ro)



Tuesday, September 15

8:30 a.m. to 10:30 a.m.

Bioactive and Anti-microbial Agents I (MB 252) – Co-Chairs: Chi-Ming Liang and Hans J. Vogel

A universal expression system for the biosynthetic production of antimicrobial peptides (Hans J. Vogel)

The regulatory role of GNMT in human cancer prevention (En-Pei Chiang)

Recombinant VP1 of FMDV differentially regulates motility of cancer cells and microphages (Chi-Ming Liang)

Lactoferrin prevents dimethylnitrosamine – induced chemical injury of liver fibrosis by inhibiting stellate cell activation (Chuan-Mu Chen)

General Biotechnology (MB 251) – Co-Chairs: Burim N. Ametaj and Koretaro Takahashi

High purity cerebroside preparation from starfish and preparation of liposomes from the rest complex lipids (Koretaro Takahashi)

Plant proteins for nutraceutical and functional food applications (Lingyun Chen)

Enzymatic synthesis of medium- and long-chain triacylglycerols in packed-bed column reactor (Yinglai Teng)

Lipid derived amphiphilic systems and monomers (Aman Ullah)

Peroxisomal ATG37 binds ATG30 or palmitoyl-CoA to regulate phagophore formation during pexophagy (Geetha Ramakrishnan)

Metabolomics: a new biotechnology for improving dairy cattle health (Burim N. Ametaj)

Plant Biotechnology III (MB Auditorium) – Co-Chairs: D. Brian Fowler and Jocelyn A. Ozga

Use of genomic tools in breeding for complex traits – the cold tolerance in winter cereals experience (D. Brian Fowler)

Transcriptome changes in two *Vigna radiata* varieties in response to cold stress (Tsai-Yun Lin)

Suppression of biosynthesis of volatile compounds by a phytoplasma effector (Jun-Yi Yang)

Effects of nanomaterials on *Fusarium oxysporum* f. sp. *niveum* and vegetable seedling growth (Pi-Fang Linda Chang)

Functional analysis of biocontrol bacterium *Pseudomonas taiwanensis* (Wen-Jen Chen)

Gibberellin increases seed sink strength in *Pisum sativum* L. (Jocelyn A. Ozga)

10:30 a.m. to 1:30 a.m.

Networking Break, Free Time and Lunch

1:30 p.m. to 3:00 p.m.

Keynote Presentations (MB Auditorium) – Chair: Jie-Fu Shaw

Enhancing crop yield and value through transcriptome metabolic engineering (Oliver P. Peoples)

Recent developments in regenerating transgenic oil palm (G.K.A. Parveez)

3:00 p.m. to 3:30 p.m.

Networking Break



3:30 p.m. to 5:30 p.m.

Biocatalysis II (MB 251) – Co-Chairs: Lu-Kwang Ju and Ramesh N. Patel

Biocatalysis: synthesis of chiral intermediates for development of drugs (Ramesh N. Patel)

Amino acids networks in enzyme catalysis (David D. Boehr)

Enzyme production and use for enriching soy meal protein and removing indigestibility (Lu-Kwang Ju)

Enzymatic production of (2*S*, 3*R*, 4*S*)-4-hydroxy-isoleucine using Fe(II)/ α -ketoglutarate-dependent L-isoleucine dioxygenase (Masakazu Sugiyama)

Reforming of sucrose fatty acid esters by lipase reactions (Yoshitaka Nishiyama)

Nutraceuticals and Food Biotechnology II (MB 252) – Co-Chairs: Lie-Fen Shyur and Suk Hoo Yoon

Autooxidation and photooxidation of triacylglycerols containing conjugated linoleic acids (Suk Hoo Yoon)

Cocoa butter equivalents prepared from fractionated palm stearin and shea stearin (Byung Hee Kim)

Employment of fungal solid-state fermentation products in broiler chicken feed (Tatiana Klempová)

Herb-based functional foods: from laboratories to the market (Hsin-Shang Tsay)

R&D of natural medicines for resolution of inflammatory disorders (Lie-Fen Shyur)

Plant Biotechnology IV (MB Auditorium) – Co-Chairs: Joseph G. Boothe and M. Tahir

Products of developing canola with very low levels of saturated fat (M. Tahir)

Down regulation of the IND gene causes male sterility in canola (*Brassica napus* L.) (Saleh Shah)

Palliser's promise: production of oils enriched in very long-chain fatty acids in *Brassica carinata* for industrial and nutra-pharma applications (Elizabeth-France Marillia)

Recombinant production and characterization of type 1 *Brassica napus* diacylglycerol acyltransferases (Michael S. Greer)

Commercial challenges in development of novel seed oil products (Joseph G. Boothe)

Economic implications of changing demands for Canadian canola (Henry An)



Wednesday, September 16

8:30 a.m. to 10:30 p.m.

Bioactive and Anti-microbial Agents II (MB 252) – Co-Chairs: Toshihiro Nagao and Lukas Neutsch

Optimizing lipid metabolism in *P. tricornutum* (Kirstin Feussner)

Advanced bioprocesses for industrial production of high-value compounds for microalgae (Lukas Neutsch)

Selective antibacterial activity of palmitoleic acid useful for possible prevention of atopic dermatitis (Toshihiro Nagao)

Development of novel vaccines against human and avian influenza viruses (Shu-Mei Liang)

Biofuels, Bioproducts and Bioconversions II (MB 251) – Co-Chairs: Thomas A. McKeon and Mark A. Smith

Toxicity of squalene in yeast deficient in lipid storage (Roman Holic)

Short-cuts through biocatalysis from vegetable oils to value-added industrial compounds (Hak-Ryul Kim)

Bringing the castor plant back as a crop in temperate regions (Thomas A. McKeon)

Novel oils containing hydroxy fatty acids, potential and challenges to commercial production (Mark A. Smith)

Biochemical properties of *Lesquerella fendleri* LCAT-like phospholipase A (Guanqun Chen)

Metabolic engineering of hydroxy fatty acid in heterologous systems (Xiao Qiu)

Plant Biotechnology V (MB Auditorium) – Co-Chairs: Habibur Rahman and Gane Ka-Shu Wong

1KP and the comparative genomics of biological pathways (Gane Ka-Shu Wong)

High-throughput omics approaches in genetics and biotechnology (Shih-Shun Lin)

Metabolomics, the Metabolomics Innovation Centre and plant biotechnology (Jennifer Reid)

Towards elimination of α -linolenic acid from brassica seed oil: mutations in FAD3 genes, molecular characterization and implication in breeding (Habibur Rahman)

Composition and antifungal activity of balsam from *Liquidambar formosana* Hance (Shih-Chang Chien)

Minimally invasive techniques to visualize the rhizosphere (Emil Hallin)

10:30 a.m. to 11:00 a.m.

Networking Break

11:00 a.m. to 11:20 a.m.

Closing Remarks and Presentation on 12th ISBAB (MB Auditorium)

11:20 a.m. to 1:20 p.m.

Free Time and Lunch

1:20 p.m.

Board Buses (in front of Professional Development Centre)

1:30 p.m. to 5:30 p.m.

Study Tour – Mountain Lakes

5:30 p.m. to 9:30 p.m.

Closing Dinner – Brewsters MountView Barbecue
(Combined event with Phytola Science Meeting)