

Lipidomics and Bioactive Lipids in Metabolism and Disease

February 26–March 2, 2017 | Granlibakken Tahoe | Tahoe City, California | USA

Scientific Organizers:

Alfred H. Merrill, Georgia Tech, USA

Walter Allen Shaw, Avanti Polar Lipids, Inc., USA

Sarah Spiegel, Virginia Commonwealth University School of Medicine, USA

Michael J.O. Wakelam, Babraham Institute, UK

This new international conference has evolved from and replaced the annual LIPID MAPS meeting that occurred every May in La Jolla, California since 2003.

The ability to analyze large numbers of lipids from different categories (e.g., fatty acyls, glycerolipids, sphingolipids and sterols) has greatly advanced our understanding of their biochemical functions and roles in disease, but has also created challenges of scale. This Keystone Symposia meeting will cover areas of lipid research that have been particularly impacted by these technologies. It will specifically address the challenge of managing the large data sets generated by lipidomic technologies and conceptually studying them given how interconnected and cross-regulated lipid metabolic pathways are. Bringing together an outstanding group of scientists with expertise in the lipid categories as well as in lipidomic approaches, it will summarize recent findings for the major lipid categories from state-of-the-art technologies and lay the foundation for a broader understanding of new methods and the technical capabilities and limitations of these methods, as well as where better approaches are needed.

Session Topics:

- Lipidomics in Inflammation
- Lipidomics and Infection
- Cancer Lipidomics
- Cardiovascular Lipidomics
- Lipid Localization and Implications for Cell Regulation
- Lipidomics
- Neurological Lipidomics
- Metabolism

Abstract Deadline: December 12, 2016

Discounted Registration Deadline: January 9, 2017



Upper image of abnormal lipid metabolism in prostate cancer courtesy of Ji-Xin Cheng, Purdue University Center for Cancer Research, National Cancer Institute, NIH

Meeting Hashtag: #KSlipid

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KEYSTONE SYMPOSIA

on Molecular and Cellular Biology

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SUNDAY, FEBRUARY 26

Arrival and Registration

MONDAY, FEBRUARY 27

Welcome and Keynote Address (Organizers)

Edward A. Dennis, University of California, San Diego, USA
Lipidomics Highlights Infection and Inflammation Progression

Lipidomics in Inflammation

***Sarah Spiegel**, Virginia Commonwealth University, USA

***Alfred H. Merrill, Jr.**, Georgia Institute of Technology, USA

Garret A. FitzGerald, University of Pennsylvania, USA
Prostaglandins and Their Inhibitors

Valerie B. O'Donnell, Cardiff University, UK
Lipidomics Characterization of Oxidation during Platelet Activation and Physiological Blood Clotting

Richard L. Proia, National Institutes of Health, USA
Visualizing Sphingosine-1-Phosphate G Protein-Coupled Receptor Signaling in Living Animals

Charles E. Chalfant, Virginia Commonwealth University, School of Medicine, USA
Short Talk: The Lipidome in Inflammation, Wound Healing, and Pre-Eclampsia

Veronica G. Anania, Genentech, Inc., USA
Short Talk: Bioactive Lipids as Pharmacodynamic Biomarkers of Mast Cell Activity in the Clinic

Description of LIPID MAPS and Website Tools

***Valerie B. O'Donnell**, Cardiff University, UK

Eoin Fahy, University of California, San Diego, USA

Lipidomics and Infection

***Charles R. Brown**, University of Missouri, USA

Markus R. Wenk, National University of Singapore, Singapore
Natural Variation of Blood Plasma Lipids in Healthy Asian Individuals

Dennis R. Voelker, National Jewish Health, USA
Journal of Lipid Research Lectureship: Pulmonary Surfactant Phospholipids Regulate Innate Immunity

Frances Platt, University of Oxford, UK
The Niemann-Pick Type C Disease Pathway and its Unanticipated Role in Infection

Poster Session 1

TUESDAY, FEBRUARY 28

Cancer Lipidomics

***Markus R. Wenk**, National University of Singapore, Singapore

***Andrew J. Morris**, University of Kentucky, USA

Sarah Spiegel, Virginia Commonwealth University, USA
Targeting the Sphingosine-1-Phosphate Axis and Development of a Novel Therapy for Endocrine-Resistant Breast Cancer

Tony Futerman, Weizmann Institute of Science, Israel
Ceramide Synthases and Cellular Function

Michael J.O. Wakelam, Babraham Institute, UK
Lipidomic Changes Predict Novel Therapeutic Targets in Colorectal Cancer and Other Diseases

Christian Metallo, University of California, San Diego, USA
Understanding the Interplay between Amino Acid and Lipid Metabolism

Tzipora Goldkorn, University of California, Davis, USA
Short Talk: nSMase2 Conveys Oncogenic Advantages to Tumors of Lung Adenocarcinoma in Smokers via SphK1

David A. Potter, University of Minnesota, USA
Short Talk: Heme Binding Biguanides Target Cytochrome P450 Dependent Cancer Cell Mitochondria

Cardiovascular Lipidomics

***Julian L. Griffin**, University of Cambridge, UK

William Griffiths, Swansea University, UK
Oxysterol Lipidomics in Mouse and Man

L. Ashley Cowart, Medical University of South Carolina, USA
Advances in Understanding the Roles of Ceramide Synthase Isoforms in the Cardiac Response to Dyslipidemia

Jeffrey G. McDonald, University of Texas Southwestern Medical Center, USA
Analysis of ELOVL Enzyme Activity by Infusion-Based Lipidomics Using MS/MSALL

Andrew J. Morris, University of Kentucky, USA
Short Talk: Lysophosphatidic Acid Metabolism and Signaling in Atherosclerosis

Rheem A. Totah, University of Washington, USA
Short Talk: cis- and trans-Epoxyeicosatrienoic Acids in Patients with Cardiovascular Disease

Recognition of Scholarship Awardees

***Alfred H. Merrill, Jr.**, Georgia Institute of Technology, USA

Patricia Rodrigues, Cardiff University, UK
GATA6 Transcription Factor Regulates Lipid Metabolism in Tissue Resident Macrophages

Opeyemi Stella Ademowo, Aston University, UK
Phospholipid Oxidation and Carotenoid Supplementation in Alzheimer's Disease Patients

Poster Session 2

WEDNESDAY, MARCH 1

Keynote Address

***Michael J.O. Wakelam**, Babraham Institute, UK

Vytas A. Bankaitis, Texas A&M University, USA
Phosphatidylinositol Transfer Protein-Dependent Golgi Positioning Controls Cell Polarity in Neural Stem Cells and Projection Neurons in Developing Mammalian Forebrain

Lipid Localization and Implications for Cell Regulation

***Rosalind A. Coleman**, University of North Carolina at Chapel Hill, USA

***Junken Aoki**, Tohoku University, Japan

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Per Haberkant, European Molecular Biology Laboratory, Germany
A Quantitative Map of Cellular Protein-Sphingolipid Complexes and their Lipid-Binding Profile

Erwin London, SUNY Stony Brook, USA
Using Cyclodextrins to Control the Lipid Composition, Lipid Asymmetry, and Membrane Properties of Artificial Vesicles and Living Cells

John Katsaras, Oak Ridge National Laboratory, USA
Model Membranes, Bacteria and Lateral Membrane Organization

Alexander Kros, Leiden Institute of Chemistry, Leiden University, Netherlands
Short Talk: Quantifying Membrane Compound Exchange Between Live Mammalian Cells

Kuniyuki Kano, Graduate School of Pharmaceutical Sciences, Tohoku University, Japan
Short Talk: Imaging MS Analysis of Lysophospholipids using AP-MALDI-MS

Workshop: LIPID MAPS Tools

***Eoin Fahy**, University of California, San Diego, USA
The LIPID MAPS Lipidomics Gateway

Lipidomics

***Valerie B. O'Donnell**, Cardiff University, UK

***Friedrich Spener**, University of Graz, Austria

Walter Allen Shaw, Avanti Polar Lipids, Inc., USA
When Bad Things Happen to Good Samples: The Good, the Bad, and the Scary of Lipid Mass Spectrometry

Kim Ekroos, University of Southern Denmark, Denmark
High-Definition FLUX Lipidomics

Toyoshi Fujimoto, Nagoya University Graduate School of Medicine, Japan
Freeze-fracture Electron Microscopy to Define Distribution of Lipids and Lipid Domains at the Nanoscale

Roger Sandhoff, German Cancer Research Center, Germany
Short Talk: Stereoisomer-Specific Quantification of Simple Bioactive Glycosphingolipids from Bacteria and Mammals

Poster Session 3

THURSDAY, MARCH 2

Neurological Lipidomics

***William Griffiths**, Swansea University, UK

***Tony Futerman**, Weizmann Institute of Science, Israel

Robert C. Murphy, University of Colorado Denver, USA
High-Throughput Lipidomic Analysis the CTS Method: Application to Neuronal Tissue

Maria Fuller, SA Pathology, University of Adelaide, Australia
The Brain Lipidome: A Therapeutic Target for Neurodegenerative Disorders

Steffany A.L. Bennett, University of Ottawa, Canada
Translational Lipidomics: Can Patients with DLB, AD or MCI be Stratified by Interrogating their Plasma Lipidomes?

Janet E. Deane, University of Cambridge, UK
Short Talk: Aberrant Glycosphingolipid Processing in a Lysosomal Storage Disease

Patricia C. Kane, NeuroLipid Research Foundation, USA
Short Talk: Addressing Neurological Disorders by Clearing Epigenetics and Stabilizing Membranes and Cardiolipin with Bioactive Lipids

Metabolism

***Dennis R. Voelker**, National Jewish Health, USA

***L. Ashley Cowart**, Medical University of South Carolina, USA

Rosalind A. Coleman, University of North Carolina at Chapel Hill, USA
Acyl-CoA Metabolism and Partitioning

James Mukasa Ntambi, University of Wisconsin-Madison, USA
Regulation of Adipose Tissue Lipogenesis and Fatty Acid Oxidation

Nicholas O. Davidson, Washington University School of Medicine, USA
Fatty Acid Flux and Hepatic Fibrosis: Pathways Linking Lipid Metabolism and Liver Injury

Meeting Wrap-Up: Outcomes and Future Directions (Organizers)

FRIDAY, MARCH 3

Departure