

# 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

## Lipidomics and Bioactive Lipids in Metabolism and Disease (B6)

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Sponsored by Abide Therapeutics Inc.

Abstract & Scholarship Deadline: October 26, 2016 / Abstract Deadline: December 12, 2016 / Discounted Registration Deadline: January 9, 2017

### 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**, Virginia Commonwealth University, 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**, University of Cambridge, 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 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**, Lipidomics Consulting Ltd., Finland  
*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**, Virginia Commonwealth University, 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