

Lipids in Health and Disease

Symposium

November 8, 2019

Rutgers University, New Brunswick, NJ



New Jersey Institute for Food,
Nutrition, and Health

Lipids in Health and Disease

Rutgers Center for Lipid Research Symposium
November 8, 2019



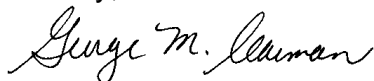
Dear Colleagues,

On behalf of the organizing committee, we are pleased to welcome you to the fifth annual symposium of the Rutgers Center for Lipid Research (RCLR) entitled "*Lipids in Health and Disease*." We have brought together scientists outside and within the RCLR family who will share their knowledge, results, and insights into how lipids are involved in health and disease. We are certain that you will find the presentations and posters, which are designed to facilitate your interaction with other scientists, stimulating, informative, and enjoyable.

The RCLR is a center of the New Jersey Institute for Food, Nutrition, and Health (IFNH) that promotes multidisciplinary research on the biochemical, biophysical, cellular and molecular mechanisms involved in lipid metabolism, and extending this information to the underpinnings of lipid-based diseases such as obesity, lipodystrophy, diabetes, and heart disease. RCLR fosters interaction among faculty, postdoctoral associates, and students across the university. We hold monthly research meetings; postdoctoral associates and students can present their research and receive constructive feedback in a warm and friendly atmosphere. We also have an active seminar series that brings renowned scientists to Rutgers for interactions with RCLR members and the university community.

In closing, I convey my appreciation to the organizing committee and the IFNH for their support in bringing this symposium to fruition.

Sincerely,

A handwritten signature in cursive script that reads "George M. Carman". The ink is dark and the signature is fluid and legible.

George M. Carman, Ph.D.

Lipids in Health and Disease

Rutgers Center for Lipid Research Symposium

November 8, 2019

Organizing Committee

George M. Carman
Joseph L. Dixon
Gil-Soo Han
Olga Ilnytska
Loredana Quadro
Harini Sampath
Judith Storch
Laura Amador, Conference Coordinator

Volunteers

Natalie Burchat
Youn-kyung Kim
Joanna Kwiatek
PJ Wisniewski

Supporters



New Jersey Institute for Food,
Nutrition, and Health

Lipids in Health and Disease

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Program

8:30 am *Registration and Poster Setup*

9:00 am **Welcome and Introductions**

Robert M. Goodman, Dean, School of Environmental and Biological Sciences
George M. Carman, Rutgers Center for Lipid Research

Session 1 Chair: Judith Storch

9:15 am **Ira J. Goldberg** (New York University)
Triglycerides from the gut, through the blood, to the heart

Discussion

9:55 am **Judith Storch** (Rutgers University)
Regulation of chylomicron secretion in obesity

Discussion

10:30 am *Break & Group Photo*

10:55 am **Joseph L. Dixon** (Rutgers University)
A wild ride around the cell, the secretion of VLDL from the liver cell

Discussion

11:30 am **Isabel Medina Méndez** (Spanish National Council of Research CSIC)
Modulation of lipid mediators and protein carbonylome in pre-diabetic adipose tissue

Discussion

12:05 pm *Lunch and Posters*

Poster Session Chairs: Gil-Soo Han & Olga Ilnytska

IFNH, 2nd
floor

Session 2 Chair: Loredana Quadro

- 2:00 pm **Harini Sampath** (Rutgers University)
Regulation and physiological roles of intestinal delta-9 desaturases
Discussion
- 2:35 pm **Chunmin C. Lo** (Ohio University)
Role of Apo A-IV in intestinal lipoprotein metabolism and food intake
Discussion
- 3:10 pm **Loredana Quadro** (Rutgers University)
Regulation of lipoprotein biosynthesis by beta-carotene
Discussion
- 3:45 pm **George M. Carman** (Rutgers University)
Poster Awards
Carman Prize in Lipids
- 4:00 pm Adjourn

Speaker Biographies



Ira J. Goldberg, M.D.

Dr. Goldberg graduated from MIT, received his medical degree from Harvard Medical School, and served his internship and residency in medicine at New York University-Bellevue Hospital Medical Center. He subsequently completed fellowships in endocrinology and metabolism and atherosclerosis and metabolism, at Mount Sinai School of Medicine in New York City. He was appointed to the faculty of the Department of Medicine at Columbia University in 1983 and was Chief of the Division of Preventive Medicine and Nutrition and the Dickinson Richards Professor of Medicine. He is currently the Director of the Division of Endocrinology, Diabetes and Metabolism at New York University Langone School of Medicine and the Clarissa and Edgar Bronfman Professor of Medicine.

Dr. Goldberg has published over 200 articles. These include written numerous book chapters, editorials, and reviews. He has co-authored chapters on lipid disorders in the 14th and 15th editions of Harrison's Principles of Internal Medicine and the current edition of Williams Textbook of Endocrinology. He is an associate editor of both the Journal of Lipid Research and Journal of Clinical Lipidology.

Dr. Goldberg's research has focused on abnormalities of lipoprotein metabolism, macrovascular disease in diabetes, and the role of triglycerides in atherosclerosis. He has received grant support in a number of investigational studies that involve atherogenicity of apolipoprotein B-containing lipoproteins, regulation of plasma triglyceride by lipase enzymes, diabetic macrovascular disease, and lipid uptake and toxicity in the heart. Among Dr. Goldberg's honors is a MERIT Award from the National Heart, Lung, and Blood Institute. He was chosen in 2007 to give the R. Levy Lecture and in 2017 to give the Lyman Duff Lecture on atherosclerosis research at the American Heart Association Scientific Sessions and the E. Bierman Lecture on diabetes and heart disease at the 2010 American Diabetes Associated Meeting. In 2008 he was the C. Kilo visiting professor at Washington University. He has previously served as chair of the NIH Metabolism and CADO (cellular aspects of diabetes and obesity) study sections and currently is a member of the Myocardial Ischemic and Metabolism (MIM) study section.



Judith Storch, Ph.D.

The Storch laboratory studies cellular lipid transport mechanisms, focusing on lipid-binding proteins at the structural and functional levels. The laboratory uses biochemical, biophysical, molecular, cell biological, genetic, and physiological techniques to better understand how lipids are transported and targeted in cells. The transport of dietary lipid products in the intestinal enterocyte has been a particular focus. The studies provide fundamental information relevant to diseases including obesity, heart disease, and lysosomal storage disorders. Judy obtained an M.S. in Human Nutrition and a Ph.D. in Physiology and Biophysics from

Columbia University, where she studied the role of lipids in regulating membrane fluidity. She did postdoctoral research at the Harvard Medical School, where her interests in intracellular lipid transport began. She was an Associate Professor in the Nutrition Department at the Harvard School of Public Health before joining the faculty of Rutgers University in 1992, where she is currently Distinguished Professor in the Nutritional Sciences Department. She has served as Associate Editor for the Journal of Nutrition and is currently the Executive Editor of *Biochimica et Biophysica Acta-Molecular and Cell Biology of Lipids*. She is the recipient of the American Society for Nutrition Osborn and Mendel Award.



Dr. Joseph L. Dixon, Ph.D.

Dr. Joseph L. Dixon grew up in Brooklyn, NY, and attended Brooklyn Prep High School and later SUNY-Binghamton. He received M.S. and Ph.D. degrees from the University of Wisconsin-Madison. In 1989, he went to Columbia University to study lipoproteins. After teaching at the University of Missouri, he moved in 2004 to Rutgers University, New Jersey, which has a strong group of lipid researchers. Dr. Dixon is a lipid biochemist, cell biologist, and an Associate Professor of Nutrition in the Department of Nutritional Sciences at Rutgers University, New Brunswick. He has been teaching courses on Nutrition, including a course entitled, Nutrition and Health, for over 25 years. His specific research interests are lipid metabolism, the secretion of apolipoprotein B and VLDL from the liver, and the mass spectrometry of lipids. His book on Ancel Keys can be viewed on his website, <http://www.josephldixon.com>



Isabel Medina Méndez Ph.D.

Dr. Isabel Medina is Full Professor in Food Chemistry at The Spanish National Council of Research CSIC. Her research is devoted to enhance quality and nutritional value of marine and aquaculture products targeting the bioactive role of marine lipids. Her lab in the Institute of Marine Research IIM-CSIC at Vigo has developed advanced Lipidomic and Redox Proteomic platforms based on Mass Spectrometry to study how marine lipids act against inflammation and oxidative stress associated to dietary diseases. These studies provide basic information related to the formation of omega-3 lipid mediators as resolvers of inflammation and protein oxidation as the main subject of *in vivo* oxidative imbalance. The analysis of carbonylated proteins, also referred as 'carbonylome', reveals an individual response of proteins to marine lipids which are able to modulate critical metabolic pathways.

Isabel received the M.S. and Ph.D. degrees in Chemistry from the University of Santiago de Compostela, SP. She continued her scientific postdoctoral education at the University of Davis, CA, the University Federico II in Naples, and the School of Biological Science

in Guilford, U.K., where she applied biophysical techniques to study marine lipids as parts of the human diet and fish feeding. She has been on charge of different scientific responsibilities as a member of the Spanish Advisory Body for Technology Transference on charge of the management of Natural Resources, Farming, Agricultural Sciences, Food, and Biotechnology. She is currently responsible of the national coordination of research in Food Science and Technology in CSIC. She was Vice President of the SEAFOODPLUS Research Platform, International Platform on Fisheries and Aquaculture Products and she is member of the Doctorate School of the University of Florence. She is the recipient of the Galician Academy of Sciences Award.



Harini Sampath, Ph.D.

Dr. Sampath is an Assistant Professor of Nutritional Sciences and Director of the Lipidomics Core at the New Jersey Institute for Food, Nutrition, and Health (IFNH). Research in the Sampath laboratory utilizes nutritional, genetic, and biochemical approaches to study the regulation of cellular desaturases, including the multiple isoforms of the delta-9 desaturase, stearoyl-CoA desaturase (SCD). The monounsaturated lipid products of these enzymes play critical roles in lipid accumulation, cellular signaling, and maintenance of membrane fluidity with implications to numerous pathologies, including cardiometabolic diseases, intestinal inflammation, and cancers. The lab is focused on elucidating the cell-type specific regulation and roles of these enzymes, and their lipid substrates and products.



Chunmin C. Lo, Ph.D.

Dr. Lo is an Assistant Professor of Biomedical Sciences and the director of Mouse Metabolic Phenotyping Core Facility in the Ohio University Heritage College of Osteopathic Medicine. Dr. Lo's laboratory investigates that apolipoprotein A-IV (ApoA-IV) and cholecystokinin (CCK) act on neural pathways to control lipid transport, glucose metabolism and energy homeostasis. To reach the goals, Dr. Lo and her team members use rodent models with vagal deafferentation, denervation of sensory and sympathetic nerves and intracerebroventricular cannula implantation as well as genetic mouse models to reveal the effect of gut peptides in the regulation of metabolic and cardiovascular diseases. In addition, ex-vivo methods are used to characterize the underlying mechanism of lipolysis and gut peptide secretion. Dr. Lo and her team have demonstrated that 1) ApoA-IV interacts with CCK to regulate energy homeostasis; 2) ApoA-IV requires vagal nerves and CCK to relay satiating signals to the brain; 3) ApoA-IV stimulates CCK release via lysophosphatidic acid receptor 5; 4) ApoA-IV elevates thermogenesis in brown adipose tissue; 5) CCK is involved in the regulation of obesity and insulin sensitivity; and 6) chylomicron formation stimulates neuronal activation in the brain.



Lordana Quadro, Ph.D.

Dr. Loredana Quadro is a Professor of Food Science and member of the Rutgers Center for Lipid Research (RCLR) and of the Institute of Food Nutrition and Health (IFNH) at Rutgers University. She received her B.S. degree from the School of Biology at the University of Naples (Italy) and her Ph.D. degree in Biotechnology from the School of Medicine at the University of University of Naples (Italy). Her postdoctoral training was in Nutritional Biochemistry at Columbia University in New York. Dr. Quadro's research aims at understanding the mechanisms of vitamin A and carotenoids absorption, transport and metabolism in mammalian tissues by using genetically modified mouse models. A major focus of her research is on the maternal-fetal metabolism of vitamin A and its carotenoid precursor beta-carotene with the ultimate goal to understand how to prevent or improve congenital defects as well as maternal pathological conditions associated with both the deficiency and excess of the vitamin.

Spatio-nutritional regulation of intestinal desaturases

Natalie Burchat and Tasleenpal Akal, Rutgers University

Autophagy modulates lipid metabolism in Lkb1-deficient K-Ras-driven lung tumorigenesis

Vrushank Bhatt, Rutgers University

Bisphenol A potentiates the deleterious metabolic effects of saturated fats

Bhavya Blaze, Rutgers University

TLR4 promotes fibrosis in non-alcoholic fatty liver disease

J. Matias Caviglia, Brooklyn College

HNF4 regulates fatty acid β -oxidation and is indispensable for intestinal stem cell renewal

Lei Chen, Rutgers University

The yeast Nem1-Spo7 phosphatase complex, which dephosphorylates and regulates Pah1 phosphatidate phosphatase, is phosphorylated by protein kinase C

Prabuddha Dey, Rutgers University

Whole-body liver and intestine fatty acid-binding protein ablation in C57BL/6 mice differentially affects the volume and histological features of adipose depots

Anastasia Diolintzi, Rutgers University

Lipoprotein biosynthesis regulation by the main vitamin A precursor: β -carotene

Elena Giordano, Rutgers University

Exploring lipid rafts by modulating the dynamics of cell membranes

Bryan Gutierrez, Rutgers University

Vitamin D status and nutrition status as a risk factor for mobility, but not mortality, after hip fracture

Lihong Hao, Rutgers University

Cardiac β -carotene metabolism during pregnancy

Chelsea Holloway, Rutgers University

Marginal vitamin A deficiency perturbs intestinal functions and fecal microbiome: insights from a mouse model

Maryam Honarbakhsh, Rutgers University

The role of lysobisphosphatidic acid (LBPA) in cholesterol clearance in Niemann-Pick Type C1 disease

Olga Ilnytska, Rutgers University

Lysosomal lipid content as a quantitative biomarker *in vitro* and *in vivo*

Prakrit Jena, Memorial Sloan Kettering Cancer Center

Evacetrapib Reduces Prebeta 1 HDL in Patients with Atherosclerotic Cardiovascular Disease

Xian-Cheng Jiang, SUNY Downstate Medical Center

Clearing Epigenetic Insult with Phospholipids

Edward Kane, NeuroLipid Research Foundation

Posters

Reversing Epigenetic Insult with Phospholipids, Chaperones and Bioactive Lipids in Neurological Disease

Patricia Kane, NeuroLipid Research Foundation

Mortalin, a potential regulator of PKCdelta in energy homeostasis

Youn-Kyung Kim, Rutgers University

***Caulobacter crescentus* Adapts to Phosphate Starvation by Synthesizing Anionic Glycoglycerolipids and a Novel Glycosphingolipid**

Eric Klein, Rutgers University

Role of DNA repair protein OGG1 in obesity and adipogenesis

Sai Santosh Babu Komakula, Rutgers University

Membrane phospholipid composition governs Pah1 PA phosphatase activity

Joanna Kwiatek, Rutgers University

Overexpression of a non-specific lipid transfer protein in wheat enhances resistance to *Fusarium graminearum*

John McLaughlin, Rutgers University

Sexually dimorphic effects of 7,8-DHF on body weight and intestinal microbiome

Priyanka Sharma, Rutgers University

Investigation of Combination Treatment for Non-alcoholic Steatohepatitis

Mary Stofan, Rutgers University

Investigation of cannabidiol(CBD) on an ovariectomized murine model

Ke Sui, Rutgers University

Phenotypic and metabolic changes in liver-specific Liver FABP knockout mice

Hiba Tawfeeq, Rutgers University

Gut microbiota and intestinal FXR mediate polyphenol-induced improvements in glucose metabolism

Kevin Tveter, Rutgers University

Sex-dependent alterations of energy homeostasis due to organophosphate flame-retardant exposure in an adult mouse model of diet-induced obesity

Gwyndolin Vail, Rutgers University

HNF4 Regulates β -Oxidation and is Indispensable for Intestinal Stem Cell Renewal

Michael Verzi, Rutgers University

Role of inositol catabolism in *C. neoformans* morphogenesis and virulence

Yina Wang, Rutgers University

Synthetic cells: A) steroids that sense peroxides and release cargo; B) phospholipid membranes that recruit nucleic acids

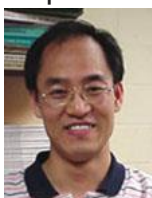
Ruchi Yadav, Rutgers University

Carman Prize in Lipids



The George M. and Maureen D. Carman Prize in Lipids is an endowed prize established to encourage research and to provide financial assistance to graduate students and postdoctoral fellows/associates in the School of Environmental and Biological Sciences (SEBS). The prize is awarded for outstanding research achievement in the area of lipid biochemistry. You can contribute to the endowment via the [Rutgers Foundation](#) web site and earmark the funds for the Carman Prize in Lipids.

Recipients



Hyeon-Son Choi
(2007)



Anibal Soto-Cardalda
(2008)



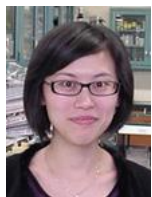
Younkyung Kim
(2009)



Stylianos Fakas
(2011)



Lesley Wassef
(2011)



Wen-Min Su
(2012)



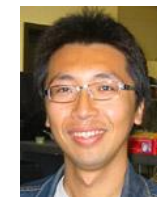
John Douglass
(2013)



Yixuan Qiu
(2014)



Marc Tuazon
(2014)



Lu-Sheng Hsieh
(2015)



Yeonhee Park
(2016)



Inna Nikonorova
(2017)



Prabuddha Dey
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Joanna Kwiatek
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