



Gastrointestinal Control of Metabolism

May 9–13, 2017 | Tivoli Hotel and Congress Center | Copenhagen | Denmark

Scientific Organizers:

Randy J. Seeley, University of Michigan, USA

Matthias H. Tschöp, Helmholtz Zentrum München and Technische Universität München, Germany

Fiona M. Gribble, Cambridge Institute for Medical Research, University of Cambridge, UK

Joint with the meeting on **Neuronal Control of Appetite, Metabolism and Weight**

The twin epidemics of obesity and diabetes pose difficult challenges to the health of growing populations around the globe. A wide array of recent data link the gastrointestinal tract to the etiology of these diseases. Moreover, some of the most innovative approaches to treat obesity, diabetes and related metabolic disorders involve direct manipulation of the GI tract or manipulation of the signals that come from the GI tract. To this end, an important goal of this meeting will be to highlight a wide range of methodologies that can be brought to understand GI function as it relates to obesity and diabetes. One of the primary factors slowing research on this topic is that investigators with interest in GI function and metabolic disease come from a wide range of disciplines that are not generally represented at scientific meetings. A key goal of this meeting is to bring together leading investigators from around the globe. Gathering investigators who have been revealing function of the GI tract together with those sophisticated in metabolism – as well as encouraging early-career investigators to delve into this field – will be crucial to accelerate current work looking for novel therapeutic strategies. An important advance in our understanding of the GI tract is the appreciation of it as a major endocrine organ. A key component of the action of those GI hormones is their interaction with both the peripheral and central nervous system. Consequently, this meeting will be held jointly with a meeting that focuses on the “Neuronal Control of Appetite, Metabolism and Weight.” This is an ideal opportunity to bring together those who study how the GI tract generates these signals with those who study the neural systems that are targets for these signals.


Session Topics:

- Nutrient Sensing and Gut Signaling (Joint)
 - Gut Bacteria as Cause and Treatment of Metabolic Diseases
 - Stem Cells, Gut–Pancreas Development I
 - Signaling from Periphery to Brain to Modulate Energy Balance (Joint)
 - Controversies in Obesity/Diabetes Treatment. Surgery vs. Devices vs. Medicines. What Does the Future Hold?
 - Stem Cells, Gut–Pancreas Development II
 - Pharmacotherapies for Obesity and Type 2 Diabetes (Joint)
 - Novel Aspects of Gut Function
- plus two workshops

Scholarship Application & Discounted Abstract Deadline: January 12, 2017

Abstract Deadline: February 9, 2017

Discounted Registration Deadline: March 9, 2017



Note: Scholarships are available for graduate students and postdoctoral fellows and are awarded based on the abstract submitted.

Upper image courtesy of: Clinical Center, National Institutes of Health

Meeting Hashtag: #KSmetabolism

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KEYSTONE SYMPOSIA

on Molecular and Cellular Biology

Gastrointestinal Control of Metabolism (Z6)

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Lead Sponsor: Novo Nordisk A/S. Sponsored by MedImmune

Neuronal Control of Appetite, Metabolism and Weight (Z5)

Scientific Organizers: Lora K. Heisler and Scott M. Sternson

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TUESDAY, MAY 9

Arrival and Registration

WEDNESDAY, MAY 10

Welcome and Keynote Session (Joint)

- ***Lora K. Heisler**, University of Aberdeen, UK
- ***Randy J. Seeley**, University of Michigan, USA
- Stephen O'Rahilly**, University of Cambridge, UK
Metabolic Disease: Lessons from Natural Human Variation
- Klaus H. Kaestner**, University of Pennsylvania School of Medicine, USA
The Intestinal Stem Cell Niche – At the Base of It All

Nutrient Sensing and Gut Signaling (Joint)

- ***Andrew Butler**, St. Louis University, USA
- ***Fiona M. Gribble**, University of Cambridge, UK
- Ronald M. Evans**, HHMI/The Salk Institute, USA
Gut Feelings: Systemic Reach of Intestinal FXR
- Kristina Schoonjans**, École Polytechnique Fédérale de Lausanne – EPFL, Switzerland
Bile Acid Signaling in Metabolic Disease
- Joshua Thaler**, University of Washington, USA
Short Talk: Prevention of Microglial Inflammatory Signaling Reduces Susceptibility to Diet-Induced Obesity

Workshop 1 (Z6)

- ***Timo D. Müller**, Institute for Diabetes and Obesity, Germany
- Anne-Charlotte Jarry**, Paris Diderot University, France
Neuromedin U Blocks Gastric Emptying through Vagal-Dependent Mechanisms and Improves Oral Glucose Tolerance
- Geke Aline Boer**, University of Copenhagen, Biomedical Institute, Denmark
Acute Reduction of GIP: Effects on Lipid and Bone Metabolism
- Emily C. Bruggeman**, University of Texas Southwestern Medical Center, USA
Ghrelin Receptor Deletion Increases Morbidity and Mortality in a Prader-Willi Syndrome Mouse Model
- Natalia Petersen**, University of Copenhagen, Denmark
"Tailoring" the Intestinal Epithelium for Type 2 Diabetes Treatment: Modulation of L-Cell Differentiation
- Hai-Bin Ruan**, University of Minnesota, USA
Diet- and Microbiota-Sensitive Intestinal O-GlcNAc Signaling Controls Enteroendocrine Cell Development and Function
- Sara Lind Jepsen**, University of Copenhagen, Denmark
Somatostatin Regulates GLP-1 Secretion through the Somatostatin Receptor Subtype 2

Workshop 1: Disorders and Diseases Associated with Weight Loss (Z5)

- ***Thomas Alexander Lutz**, University of Zürich, Switzerland
- ***Petra Kotzbeck**, Medical University of Graz, Austria
- Yong Xu**, Baylor College of Medicine, USA
5-HT Neurons and Eating Disorders
- Manon Duquenne**, Université Lille 2 - INSERM, France
A Role for Tanyocyte Exocytosis in the Central Control of Energy Homeostasis?
- Christian Stockmann**, PARCC – Paris Cardiovascular Research Center, France
The Role of Vascular Endothelial Growth Factor-A in the Context of Cancer Cachexia and Chemotherapy
- Kevin G. Murphy**, Imperial College London, UK
Investigating Disorders Associated with Weight Loss
- Serge Luquet**, Université Paris Diderot, France
Palatability Can Drive Feeding Independent of AgRP Neurons
- Christin Kosse**, Francis Crick Institute, UK
Functional Properties of GAD65 Neurons in the Lateral Hypothalamus
- Yunlei Yang**, SUNY Upstate Medical University, USA
Deciphering Anorexigenic Septohypothalamic Feeding Circuits

Gut Bacteria as Cause and Treatment of Metabolic Diseases (Z6)

- ***Gilles Mithieux**, INSERM, France
- Fredrik Bäckhed**, University of Gothenburg, Sweden
Microbial Signaling from the Gut and Resulting Effects on Host Metabolism
- Martin J. Blaser**, New York University School of Medicine, USA
Effects of the Early Life Microbiota on the Development of Metabolic Illnesses
- Karine Clément**, INSERM/Sorbonne Université, France
Microbiome as Therapy
- Edna A. Trujillo**, University of Wisconsin-Madison, USA
Short Talk: Metabolite Profiling of Plasma and Cecum Elucidates the Impacts of Host Genetics and Environment on the Gut Microbiota

Interactions between Ingestive Signals and Reward Circuits (Z5)

- ***Matt Carter**, Williams College, USA
- ***Agatha A. van der Klaauw**, University of Cambridge, UK
- Michael A. Cowley**, Monash University, Australia
Leptin Receptor Expressing Neurons of the Dorsomedial Hypothalamus Play a Limited Role in Regulating Food Intake but a Critical Role in Regulating Metabolism

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Suzanne Lee Dickson, Sahlgrenska Academy, Gothenburg University, Sweden

Brain Ghrelin Signaling and Food Reward Behavior

Christian Lüscher, University of Geneva, Switzerland

Feeding Circuits that Can Override Metabolic Needs

Claire J. Foldi, Monash University, Australia

Short Talk: CNS Reward Pathways in Anorexia Nervosa: Insights from a Rat Model

Poster Session 1

THURSDAY, MAY 11

Stem Cells, Gut–Pancreas Development I (Z6)

***Praveen Sethupathy**, Cornell University, USA

Fiona M. Gribble, University of Cambridge, UK

The Biology of Enteroendocrine Cells

Heiko Lickert, Institute of Diabetes and Regeneration, Germany

Dissecting Intestinal Stem Cell Lineage Decisions

James M. Wells, Cincinnati Children's Hospital Research Foundation, USA

Human Pluripotent Stem Cell-Derived Gastrointestinal Organoids as New Models to Study Metabolic and Digestive Diseases

Lori Sussel, University of Colorado Denver, USA

Loss of Beta Cell Identity Related to Diabetes

John Furness, University of Melbourne, Australia

Short Talk: Diversity of Enteroendocrine Cells between Species and Regions Studied at a Cellular and Subcellular Level

Sandra Guilmeau, Institut Cochin, France

Short Talk: Contribution of ChREBP in Intestinal GLP-1 Production

Emerging Energy Homeostasis Neurocircuitry (Z5)

***Qingchun Tong**, University of Texas Medical School at Houston, USA

***Matthew R. Hayes**, University of Pennsylvania, USA

Sabrina Diano, Yale University School of Medicine, USA

Mitochondrial Control of the Melanocortin System

Martin G. Myers, Jr., University of Michigan, USA

LepRb Signaling and the Regulation of Transcription

Joseph T. Bass, Northwestern University, USA

Identification of an SCN-AgRP Circadian Neurocircuit Regulating Obesity and Systemic Metabolism

Lori M. Zeltser, Columbia University, USA

Gene X Environment Interactions that Promote Anorexia-Like Behavior

Ali Guler, University of Virginia, USA

Short Talk: Dopamine Signaling in the SCN Regulates Circadian Consumption of High-Fat Diet

Mathias Treier, Max-Delbrueck-Center for Molecular Medicine, Germany

Short Talk: Identification of the Hypothalamic Circuit Maintaining Food Foraging

Signaling from Periphery to Brain to Modulate Energy Balance (Joint)

***Suzanne M. Appleyard**, Washington State University, USA

***David Olson**, University of Michigan, USA

Jeffrey M. Friedman, Rockefeller University, USA

Neural Control of Food Intake, Locomotion and Glucose Metabolism

Randy J. Seeley, University of Michigan, USA

How the Gut Regulates Metabolic Status

Ivan E. de Araujo, Yale University School of Medicine, USA

What Does Sugar Do to the Brain? Circuit Logic for Sugar Sensing

Céline E. Riera, Cedars-Sinai Medical Center, USA

Short Talk: The Sense of Smell Impacts Metabolic Health and Obesity

Poster Session 2

FRIDAY, MAY 12

Controversies in Obesity/Diabetes Treatment: Surgery vs. Devices vs. Medicines – What Does the Future Hold? (Z6)

***Ruth E. Gimeno**, Eli Lilly & Company, USA

Jens Juul Holst, University of Copenhagen the Panum Institute, Denmark

The Role of the Gut in the Development of Type 2 Diabetes

Tricia M. Tan, Imperial College London, UK

Triple Gut Hormones as Therapy

David E. Cummings, University of Washington, USA

Metabolic Surgery: Mechanisms and Use of “Bariatric” Operations to Treat Type 2 Diabetes

Niels Vrang, Gubra, Denmark

Short Talk: The Effect of FXR, PPAR- α/δ and GLP-1 Agonism on Liver Disease in Diet-Induced Obese and Biopsy-Confirmed Mouse Models of NASH

Wendy M. McKimpson, Columbia University, USA

Short Talk: Foxo1-Expressing Cells in the Gut as a Source of Insulin for Diabetes Treatment

Makoto Fukuda, Baylor College of Medicine, USA

Short Talk: Gut Hormone GIP Drives Hypothalamic Pathogenesis of Obesity

Hypothalamic Signals Modulating Hunger and Complex Behavior (Z5)

***Clemence Blouet**, University of Cambridge, UK

***J. Nicholas Betley**, University of Pennsylvania, USA

Scott M. Sternson, HHMI/Janelia Research Campus, USA

Motivational Mechanisms Controlling Hunger

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Garret D. Stuber, University of North Carolina at Chapel Hill School of Medicine, USA

Lateral Hypothalamic Circuits for Feeding and Reward

Tamas L. Horvath, Yale School of Medicine, USA

Appetite Circuits in the Regulation of Complex Behavior

Roger D. Cone, University of Michigan, USA

Melanocortins: From Pharmacology to Pharmacotherapy

Tatiana Korotkova, Max Planck Institute for Metabolism Research, Germany

Short Talk: Gamma Oscillations Organize Top-Down Signaling to Hypothalamus and Enable Food-Seeking

Marcelo O. Dietrich, Yale University, USA

Short Talk: Behavioral Ontogeny of Hypothalamic Neurons

Workshop 2 (Z6)

***Lene Jessen**, Zealand Pharma, Denmark

Maria H. Hauge, Copenhagen University, Denmark

Gq and Gs Signaling Acting in Synergy to Control GLP-1 Secretion

Youngjung R. Kim, Columbia University, USA

Pyruvate Kinase as a Novel Metabolic Regulator of Beta Cell Loss in Diabetes

Alyce M. Martin, Flinders University, Australia

Gut Serotonin Is a Signaling Nexus between the Gut Microbiome and Host Metabolism

Louise Olofsson, University of Gothenburg, Sweden

Role of the Gut Microbiota in Diet-Induced Hypothalamic Inflammation

Anette Christ, University of Massachusetts Medical School, USA

Long-Term Epigenetic Re-Programming of Myeloid Precursor Cells in a Hyperlipidemic Environment

Nadja Gebert, Leibniz Institute on Aging, Germany

Age and Diet Affect the Intestinal Crypt Proteome

Jonathan D. Douros, Duke University, USA

Increased Glucose-Dependent Insulinotropic Polypeptide (GIP) Secretion and Signaling Improves Beta-Cell Function following Vertical Sleeve Gastrectomy (VSG)

Stem Cells, Gut-Pancreas Development II (Z6)

***Lori Sussel**, University of Colorado Denver, USA

Andrew B. Leiter, University of Massachusetts Medical School, USA
Differentiation of Enteroendocrine Cells

Praveen Sethupathy, Cornell University, USA

Microbiota, MicroRNAs, and Intestinal Stem Cell Function

Susumu Seino, Kobe University Graduate School of Medicine, Japan

Beta-Cell Glutamate Signaling Is Critical for Incretin-Induced Insulin Secretion

William L. Holland, University of Texas Southwestern Medical Center, USA

Short Talk: Glucagon Receptor Inhibition Restores Functional Beta Cell Mass and Reverses Hyperglycemia in Type-1 Diabetic Mice

Cutting-Edge Approaches in Obesity Research (Z5)

***Jeffrey M. Zigman**, University of Texas Southwestern Medical Center, USA

***Daniela Cota**, Neurocentre Magendie, France

Stephen Liberles, Harvard Medical School, USA

Molecular and Genetic Analysis of the Vagus Nerve

Andres Lozano, University of Toronto, Toronto Western Hospital, Canada

Deep Brain Stimulation to Treat Obesity or Anorexia

Kevin L. Grove, Novo Nordisk and Oregon National Primate Research Center, USA

Obesity-Related Genes in the Rhesus Macaque

John N. Campbell, Beth Israel Deaconess Medical Center, USA

Short Talk: A Molecular Census of Arcuate Hypothalamus and Median Eminence Cell Types

Poster Session 3

SATURDAY, MAY 13

Pharmacotherapies for Obesity and Type 2 Diabetes (Joint)

***Malcolm J. Low**, University of Michigan, USA

***Roger A. Adan**, Brain Center Rudolf Magnus, Netherlands

Daniel J. Drucker, Lunenfeld-Tanenbaum Research Institute, Canada
The Control of Gut Hormone Activity: Role of Dipeptidyl Peptidase-4

Matthias H. Tschöp, Helmholtz Zentrum München and Technische Universität München, Germany

Gut Peptide Combination Therapy to Treat Obesity

Lora K. Heisler, University of Aberdeen, UK

Modifying CNS 5-HT Circuits to Reverse Obesity and Type 2 Diabetes

Ruth E. Gimeno, Eli Lilly & Company, USA

Current and Emerging Targets for Obesity Treatment

Tamer Coskun, Eli Lilly & Company, USA

Short Talk: Confirming Efficacy of Celastrol and Withaferin A in a Diet-Induced Obese (DIO) Mouse Model

Shamina M. Rangwala, Janssen, Johnson & Johnson, USA

Short Talk: Gdf15-Mediated Mechanisms of Food Intake Reduction and Weight Loss

Poster Session 4

Workshop 2: CNS Regulation of Adipose Tissue (Z5)

***Kate Ellacott**, University of Exeter Medical School, UK

***Mads Tang-Christensen**, Novo Nordisk A/S, Denmark

Justin J. Rochford, University of Aberdeen, UK

Inhibition of Gamma Synuclein Directly Alters Adipocyte Mitochondrial Function and Lipid Metabolism

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Barbara Cannon, Stockholm University, Sweden

Peripheral and Central Regulation of UCP1-Dependent Thermogenesis **Departure**

Miguel López, Universidad de Santiago de Compostela, Spain

Hypothalamic AMPK: A Canonical Regulator of Energy Balance

Sangho Yu, Pennington Biomedical Research Center, USA

Preoptic Leptin Function Modulates Diet-Induced Weight Gain

Claire H. Feetham, University of Manchester, UK

Prolactin-Releasing Peptide Neurons Project from Dorsomedial to

Paraventricular Hypothalamic Nucleus to Affect Energy Expenditure

Pablo B. Martinez de Morentin, Rowett Institute of Nutrition and

Health, UK

Raphe Pallidus Serotonin Cells Modulate Brown Adipose Tissue

Thermogenesis

Novel Aspects of Gut Function (Z6)

* **John Furness**, University of Melbourne, Australia

Thue W. Schwartz, University of Copenhagen, Denmark

Nutrient and Gut Microbiota Metabolite Sensing through GPCRs in the

GI Tract

Gilles Mithieux, INSERM, France

Central Regulation of Metabolism Initiated by Intestinal

Gluconeogenesis

Tony K.T. Lam, Toronto General Research Institute, Canada

Gut Nutrient Sensing

Programming Obesity: Early Environmental Influences (Z5)

* **Michael Krashes**, NIDDK, National Institutes of Health, USA

* **Alicja A. Skowronski**, Columbia University, USA

Elinor L. Sullivan, Oregon National Primate Research Center, USA

Maternal Metabolic and Dietary Environmental Influences on Offspring

Metabolic Health and Behavior

John Speakman, Institute of Genetics and Developmental Biology,

CAS, China

The Impact of Maternal Diet on Hypothalamic Remodeling during

Development and Subsequent Susceptibility to High Fat Diets in the

Mouse

Jens C. Brüning, Max Planck Institute for Metabolism Research,

Germany

Effect of Insulin on Brain Development and Metabolic Programming

Meeting Wrap-Up: Outcomes and Future Directions (Organizers) (Z6)

Meeting Wrap-Up: Outcomes and Future Directions (Organizers) (Z5)

SUNDAY, MAY 14