Obesity is a growing worldwide epidemic, increasing co-morbid conditions, such as diabetes. The joint conferences on “Obesity and Adipose Tissue Biology” and “Functional Neurocircuitry of Feeding and Feeding Disorders” are aimed to foster cross-talk between these research areas. Adipose tissue is an endocrine organ that is both controlled by and sends signals to the brain and other organs. In addition, obesity causes an inflammatory state in the adipose tissue. The recognition that brown/beige adipose tissue is active in adult humans has triggered interest in understanding the physiology and relative importance of these tissues. Exercise and bariatric surgery are known to elicit profound metabolic benefits in type 2 diabetes, although the underlying mechanisms remain unclear. This conference will bring together cell biologists, biochemists, geneticists, physiologists, drug developers and clinical researchers, thereby facilitating knowledge exchange and interactions leading to elucidation of better treatments for obesity and diabetes. Specifically, it will examine recent advances in our understanding of brown/beige adipose tissue function; obesity-induced adipose inflammation; control of adipose tissue, appetite and energy metabolism; endocrine and paracrine signaling via secreted factors; molecular mechanisms of metabolic signaling; emerging topics, including long noncoding RNA and the gut microbiome; and approaches to drug development and the treatment of obesity and diabetes.

Plenary Session Topics:
• Drug Discovery/Development in Obesity
• Brown/Beige/BRITE Fat Activation and Function
• Adipose Tissue and Immune Cells
• Adipose Tissue Heterogeneity
• Environment and Obesity
• How Can We Translate Novel Discoveries into Obesity Treatment?
• Disease Cachexia (Joint)
• Clinical Obesity Management – Round Table Discussion
• Adipose Tissue Microenvironment

Scholarship/Discounted Abstract Deadline: Oct 23, 2018; Abstract Deadline: Nov 8, 2018; Discounted Registration Deadline: Dec 11, 2018

Visit www.keystonesymposia.org/19J7 for more details.
**Keystone Symposia on Molecular and Cellular Biology**

**Obesity and Adipose Tissue Biology (J7)**

**Scientific Organizers:** Matthias Blüher, Philipp E. Scherer and Anne Bouloumié

**Sponsored by Bayer AG, MedImmune and Novo Nordisk A/S**

*This activity is also supported by an educational grant from Lilly*

**Functional Neurocircuitry of Feeding and Feeding Disorders (J8)**

**Scientific Organizers:** Roger D. Cone, Lori M. Zeltser and Matthew R. Hayes

**February 10-14, 2019 • Fairmont Banff Springs • Banff, AB, Canada**

**Sponsored by Novo Nordisk A/S**

**Discounted Abstract & Scholarship Deadline:** October 23, 2018 / **Abstract Deadline:** November 8, 2018 / **Discounted Registration Deadline:** December 11, 2018

**SUNDAY, FEBRUARY 10**

Arrival and Registration

**MONDAY, FEBRUARY 11**

**Welcome and Keynote Address (J7)**

*Matthias Blüher*, University of Leipzig, Germany

**Stanley Ulijaszek**, Institute of Social and Cultural Anthropology, University of Oxford, UK

**Welcome and Keynote Address (J8)**

*Roger D. Cone*, University of Michigan, USA

**Richard D. Palmiter**, HHMI/University of Washington, USA

**Neural Circuitry Underlying Feeding Behavior**

**Drug Discovery/Development in Obesity (J7)**

*Anne Bouloumié*, INSERM, France

*Philipp E. Scherer*, University of Texas Southwestern Medical Center, USA

**Alan R. Saltiel**, University of California, San Diego, USA

**Inflammation at the Crossroads of Obesity and Energy Homeostasis**

**Heiko Lickert**, Institute of Diabetes and Regeneration, Germany

**Metabolic Impact on Gut Stem Cell Recruitment and Turnover**

**Nana Gletsu-Miller**, Purdue University, USA

**Sheila Collins**, Vanderbilt University Medical Center, USA

**Short Talk:** *Natriuretic Peptide "Clearance" Receptor NPRC in Adipocytes: Mechanism of Action and Consequences on Lipolysis and Thermogenesis*

**Martin Klingenspor**, Technical University of Munich, Germany

**Short Talk:** *A Novel Endocrine Gut–Brown Fat–Brain Axis Controls Satiation*

**Neural Circuitry Underlying Feeding Behavior (J8)**

*Gary J. Schwartz*, Albert Einstein College of Medicine, USA

**Linda Rinaman**, Florida State University, USA

**Neural Circuits Linking Stress and Feeding**

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

**Circuits Regulating Nutritive Control of Feeding**

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

**Role of GLP-1 Signaling**

**Melanie Maya Kaebeler**, Duke University, USA

**Short Talk:** *Sensing Calories in the Gut*

**Jovana Navarrete**, National Institutes of Health, USA

**Short Talk:** *Defined Paraventricular Hypothalamic Populations Exhibit Differential Responses to Food Contingent on Caloric State*

**Workshop 1: Research Opportunities in Eating Disorders (J8)**

**Joanna Steinglass**, Columbia University Medical Center/NYSPSI, USA

**Lara Bethke**, Health Resources in Action, USA

**Shirly Pinto**, Kallyope, USA

**Nathalie Kayadjian**, Foundation for Prader-Willi Research, USA

**Workshop 1: Targeting Brown Adipose Tissue for Obesity Treatment (J7)**

*Yu-Hua Tseng*, Joslin Diabetes Center/Harvard Medical School, USA

*Jan Nedergraad*, Stockholm University, Sweden

**Katharina Schnabl**, Technical University of Munich, Germany

**Screening of Gs-Protein Coupled Receptors in Brown Adipocytes Reveals Adrenocorticotropic Hormone as a Non-Adrenergic Activator of Thermogenesis**

**Zach Gerhart-Hines**, University of Copenhagen, Denmark

**The Orphan Receptor, GPR3, Activates Thermogenic Fat and Counteracts Obesity Independent of β-Adrenergic Signaling**

**Alexandra L. Ghaben**, University of Texas Southwestern Medical Center, USA

**Insulin Is a Novel Activator of Brown Adipocyte Thermogenesis and Promotes Increased Glucose Substrate Utilization over Lipids**

**Alexandre Caron**, University of Texas Southwestern Medical Center, USA

**Journal of Lipid Research Junior Investigator Award: Sympathetic Control of Adipose Endocrine and Metabolic Functions**

**Ruth Karlin**, Helmholtz Zentrum München, Germany

**Defining Murine Brown Adipose Tissue Heterogeneity**

**Hyeyonwoo Kim**, Dana-Farber Cancer Institute/Harvard Medical School, USA

**Irisin Induces Thermogenesis in Fat via Integrin alphaV Receptors**

**Brown/Beige/BRITE Fat Activation and Function (J7)**

**Barbara Cannon**, Stockholm University, Sweden

*Steven E. Shoelson*, Harvard Medical School, Joslin Diabetes Center, USA

**C. Ronald Kahn**, Joslin Diabetes Center and Harvard Medical School, USA

**Adipose Tissue MicroRNAs as Novel Adipokines in Regulation of Metabolism**

**Camilla Charlotte Schéele**, University of Copenhagen, Denmark

**The Plasticity of Human Brown Adipose Tissue**

**Kirsí A. Virtanen**, Turku University Hospital, University of Turku, Finland

**BAT - A Target of Future Weight Loss Strategies**

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For the most up-to-date details, visit [https://www.keystonesymposia.org](https://www.keystonesymposia.org).
Adipose Tissue and Immune Cells (J7)

**TUESDAY, FEBRUARY 12**

**Poster Session 1**

**Genetic Disorders of Feeding and Energy Storage (J8)**

- **Yu-Hua Tseng**, Joslin Diabetes Center/Harvard Medical School, USA
  Short Talk: 12-lipoxygenase Regulates Cold Adaptation and Glucose Metabolism by Producing the Omega-3 Lipid 12-HEPE from Brown Fat

- **Rana K. Gupta**, University of Texas Southwestern Medical Center, USA
  Short Talk: Sorting Out Adipocyte Progenitors and their Roles In Adipose Tissue Remodeling

**Functional Neurocircuitry of Feeding and Feeding Disorders (J8)**

- **Bruce M. Spiegelman**, University of California, San Diego, USA
  Short Talk: 12-lipoxygenase Regulates Cold Adaptation and Glucose Metabolism by Producing the Omega-3 Lipid 12-HEPE from Brown Fat

**Adipose Tissue Remodeling**

- **Stephen E. Flaherty III**, Columbia University, USA
  Short Talk: A Lipase-Independent Pathway of Lipid Release and Immune Modulation by Adipocytes via Exosomes

**Anorexia Nervosa (J8)**

- **Anorexia Nervosa**: Insights from a Rat Model
  **Claire J. Foldi**, Columbia University, USA
  Short Talk: Differential Control of Hedonic Feeding by Specific Excitatory Accumbal Inputs

**Workshop 2: White Adipose Tissue Plasticity (J7)**

- **Ichiro Shimomura**, Osaka University, Japan
  Short Talk: Lateral Hypothalamus to Basal Forebrain Neurocircuit Promotes Feeding by Suppressing Responses to Anxiogenic Environmental Cues

**Workshop 2: White Adipose Tissue Plasticity (J7)**

- **Stephen E. Flaherty III**, Columbia University, USA
  Short Talk: A Lipase-Independent Pathway of Lipid Release and Immune Modulation by Adipocytes via Exosomes

- **Anorexia Nervosa**: Insights from a Rat Model
  **Claire J. Foldi**, Columbia University, USA
  Short Talk: Differential Control of Hedonic Feeding by Specific Excitatory Accumbal Inputs

- **Qingchun Tong**, University of Texas Medical School, USA
  Short Talk: A Lateral Hypothalamus to Basal Forebrain Neurocircuit Promotes Feeding by Suppressing Responses to Anxiogenic Environmental Cues
KEYSTONE SYMPOSIA
on Molecular and Cellular Biology

Obesity and Adipose Tissue Biology (J7)

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Functional Neurocircuitry of Feeding and Feeding Disorders (J8)

Scientific Organizers: Roger D. Cone, Lori M. Zeltser and Matthew R. Hayes
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Wednesday, February 13

Poster Session 2

Adipose Tissue Heterogeneity (J7)

*Kerén I. Hilgendorf, Stanford University, USA
Ω3 Fatty Acids Activate Ffar4/Gpr120 to Trigger Adipogenesis via the Primary Cilium

Philipp E. Scherer, University of Texas Southwestern Medical Center, USA
Mechanisms of Adipose Tissue Dysfunction in Obesity

David B. Savage, University of Cambridge, UK
A Lipodystrophic Perspective on Insulin Resistance

Ellen E. Blaak, Maastricht University, Netherlands
Sex Differences in Adipose Tissue Metabolism and Tissue-Specific Insulin Resistance

Mikael Rydén, Karolinska Institutet, Sweden
Adipocyte Function and Development in Subcutaneous and Visceral Fat Depots

Neural Circuits Underlying Nausea, Emesis, and Aversive Responses (J8)

*Harvey J. Grill, University of Pennsylvania, USA
The Role of the GDF15-GFRAL in Pathway in Control of Appetite and Energy Homeostasis

Bart C. De Jonghe, University of Pennsylvania, USA
Neurocircuitry of Nausea in Chemotherapy

Zachary A. Knight, University of California, San Francisco, USA
The Neurobiology of Hunger

Paul Sabatini, University of Michigan, USA
Short Talk: Activation of Gfral Neurons Decreases Food Intake

Qi Wu, Baylor College of Medicine, USA
Short Talk: Deciphering a Hindbrain Dopaminergic Neural Circuit Mandatory for the Control of Feeding Behavior

Kerén I. Hilgendorf, Stanford University, USA

Bruce A. Bunnell, Tulane University School of Medicine, USA
The Impact of Endocrine Disrupting Chemicals on the Biology of Mesenchymal Stem Cells

Kristen E. Boyle, University of Colorado School of Medicine, USA
Maternal Obesity and Offspring Adiposity: Clues from Umbilical Cord Mesenchymal Stem Cells

Ashley A. Able, Louisiana State University, USA
Short Talk: Inhibition of H3K9 Methyltransferase, GLP, Promotes Metabolically Healthy Gene Expression in Adipocytes

Alexander S. Banks, Harvard Medical School, USA
Short Talk: CalR: Energy Balance Analysis Made Easy

David Merrick, University of Pennsylvania, USA
Short Talk: Identification of a Mesenchymal Progenitor Cell Hierarchy in Adipose Tissue

Telencephalic Control of Feeding Behavior (J8)

*Jonathan Dean Hommel, University of Texas Medical Branch, USA
Excitatory Basal Forebrain Circuits Promote Food Avoidance

*Scott E. Kanoski, University of Southern California, USA
Hippocampal Control of Feeding Behavior

Mark L. Andermann, Beth Israel Deaconess Medical Center, USA
State-Specific Gating of Motivationally Salient Cues by Midbrain Dopaminergic Inputs to Basal Amygdala

Ivan E. de Araujo, Icahn School of Medicine at Mount Sinai, USA
Vagal Control of Brain Reward Systems

Sarah Stern, Rockefeller University, USA
Short Talk: A Molecularly Defined Insular Cortex to Central Amygdala Circuit Controls Cue-Mediated Overconsumption

Christopher D. Morrison, Pennington Biomedical Research Center, USA
Short Talk: FGF21 Signals Protein Status to the Brain and Adaptively Regulates Food Choice and Metabolism

Workshop 3: Adipose Tissue Heterogeneity (J7)

*Patrick Seale, University of Pennsylvania, USA

Silvia Corvera, University of Massachusetts Medical School, USA
Yi An, University of Texas Southwestern Medical Center, USA
Mitochondrial Dicarboxylate Carrier (SLC25A10), a Regulator of Adipocyte Mitochondrial Function and Obesity

Vicky Wang-wei Tsai, St Vincent’s Hospital and University of New South Wales, Australia
Treatment with GDF15 Reduces the Adiposity and Corrects the Metabolic Dysfunction of Mice with Diet-Induced Obesity

Andrea Galmizzi, The Scripps Research Institute, USA
PGRMC2 Is an Intracellular Heme Chaperone Critical for Adipocyte Function

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FEEDING ACROSS THE LIFESPAN (J8)

How Can We Translate Novel Discoveries into Obesity Treatment?
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Olivier Bezy, Pfizer Inc., USA
Contrasting Effects of Acute Versus Chronic Treatment with Urocortin 2 on Diet-Induced Obesity and Insulin Resistance

Rebecca Wafer, University of Edinburgh, UK
In vivo Imaging in Zebrafish Identifies Novel Genetic Regulators of Subcutaneous Fat Levels

Nathalie Boulet, INSERM, France
The Heterogeneity in Progenitor Cell Subsets Contributes to the Intrinsic Remodeling Capacity of Human Fat Depots

How Can We Translate Novel Discoveries into Obesity Treatment?

*Ruth E. Gimeno, Eli Lilly and Company, USA
*C. Ronald Kahn, Joslin Diabetes Center and Harvard Medical School, USA
Kevin L. Grove, Novo Nordisk, USA
Anti-Obesity Drug Development: The Potential and the Challenges
Barbara B. Kahn, Beth Israel Deaconess Medical Center, Harvard Medical School, USA
Adipose Tissue-Derived Lipokines

Max Nieuwdorp, University of Amsterdam, Netherlands
The Gut Microbiome – Tool or Target for Obesity Treatment?

Gerson S. Profeta, University of Campinas, Brazil
Short Talk: Fluoroquinolone-Related Molecules: Promising Drugs to Increase Browning of White Fat and miRNA Biogenesis

Xiaoyong Yang, Yale University School of Medicine, USA
Short Talk: Adipocyte OGT Governs Diet-Induced Hyperphagia and Obesity

Feeding Across the Lifespan (J8)

*Shane T. Hentges, Colorado State University, USA
Sebastien G. Bouret, Inserm U1172, France
Molecular Mechanisms Controlling Development of Hypothalamic Feeding Circuits

Kelly L. Klump, Michigan State University, USA
Developmental Differences in Neurobiological Risk Factors for Binge Eating across Adolescence: Evidence from Animal and Human Models

Susan Carnell, Johns Hopkins University, USA
Childhood Eating Behaviors

Patricia O. Prada, University of Campinas, Brazil
Short Talk: Maternal Exposure to Air Pollution during Lactation Induces Hyperphagia, Obesity and Altered Glucose Homeostasis in a Gender-Specific Fashion in Adult Offspring

Alexandre Fisette, Helmholtz Zentrum München, Germany
Short Talk: Functional Identity of Hypothalamic Melanocortin Neurons Depends on Tbx3

Poster Session 3

THURSDAY, FEBRUARY 14

Disease Cachexia (Joint)
*Clifford J. Rosen, Maine Medical Center, USA
Stefan D. Anker, Charité Universitätmedizin Berlin, Germany

Cardiac Cachexia

Bruce M. Spiegelman, Harvard Medical School, USA
Regulation of Mitochondria and Oxidative Metabolism: Futile Creatine Cycle (FCC)

Daniel L. Marks, Oregon Health & Science University, USA
Neural Circuitry Mediating Cachexia

Roger D. Cone, University of Michigan, USA
The Melanocortin-3 Receptor as a Drug Target for Cachexia and Anorexia

Clinical Obesity Management - Round Table Discussion (J7)
*Timo D. Müller, Institute for Diabetes and Obesity, Germany
Matthias Blüher, University of Leipzig, Germany
Samuel Klein, Washington University School of Medicine, USA

Workshop 2: Late Breaking Topics from Abstracts (J8)
*Michael Krashes, NIDDK, National Institutes of Health, USA
Wei Xie, Harrington Discovery Institute, USA
Identification of an Asprosin Receptor

Anda Cornea, Novo Nordisk Research Center, USA
Distribution of Fluorescently Labeled Leptin in the Brain of Lean and DIO Mice

Isin Cakir, University of Michigan, USA
Inhibition of Histone Deacetylase 6 (HDAC6) Reverses Diet-Induced Obesity

Olivia D. Osborn, University of California, San Diego, USA
A Novel Approach to Block Antipsychotic-Induced Food Intake and Weight Gain

Maria Caterina De Rosa, Columbia University, USA
Generation of Paraventricular Hypothalamic Neurons from Human Pluripotent Stem Cells

Tim Gruber, Helmholtz Center Munich, Germany
Remodeling of the Hypothalamic Vasculature upon Hypercaloric Feeding Depends on Astrogial HiF1α and VEGF

Sinisa Hrvatin, Harvard Medical School, USA
PESCA: A Scalable Platform for the Development of Cell-Type-Specific Viral Drivers

Chrissa Dwyer, Ionis Pharmaceuticals, USA
Distribution and Activity of Antisense Oligonucleotides in the CNS of Rodents and Primates following Central Administration
Kevin L. Grove, Novo Nordisk, USA
Adipose Tissue Adaptive Thermogenesis

Christoph Buettner, Mount Sinai School of Medicine, USA
Adipose Tissue and Cancer: A Dangerous Dynamic Duo

Catherine C. Muller-Staumont, IPBS CNRS UMR 5089, France
Adipose Tissue Microenvironment as Target of New Emerging Therapies

Steven E. Shoelson, Harvard Medical School, Joslin Diabetes Center, USA
Adipose Tissue and Cancer: A Dangerous Dynamic Duo

Silvia Corvera, University of Massachusetts Medical School, USA
Short Talk: Mechanisms of Development of Human Adipocyte Heterogeneity

Drug Discovery for Eating Disorders (J8)

Ruth E. Gimeno, Eli Lilly and Company, USA
Treatment of Monogenic Eating Disorders

Peter Kuehnen, Charité – Universitätsmedizin Berlin, Germany
Novel Therapeutics for Eating Disorders – Targeting the GDF15/GFRAL Axis and Beyond

Xinle Wu, USA
The Metabolic Effects of GDF15 Are Mediated by the Orphan Receptor GFRAL

Robert Haws, Marshfield Medical Research Foundation, USA
Short Talk: Clinical Study Experience of the MC4R Agonist Setmelanotide in the Treatment of Rare Genetic Disorders of Obesity: Results from Bardet Biedl Syndrome and Alström Syndrome Cohorts in a Phase 2 Open Label Study

Meeting Wrap-Up: Outcomes and Future Directions (Organizers) (J7)

Meeting Wrap-Up: Outcomes and Future Directions (Organizers) (J8)

FRIDAY, FEBRUARY 15

Departure