**SUNDAY, MARCH 14**
Arrival and Registration

**MONDAY, MARCH 15**
Welcome and Keynote Session (Joint)

David J. Anderson, California Institute of Technology, USA
Neural Mechanisms of Aggression and Defense and of Their Associated Internal States

Charles S. Zuker, HHMI, Columbia University, USA
Overview of Gut-Brain Axis and Experimental Techniques

Vagal Circuits (Joint)
Speaker to be Announced

Misha Ahrens, Janelia Farms, USA
Imaging of Gut-Brain Circuits in Zebrafish

Jeffrey M. Friedman, Rockefeller University, USA
Molecular Mechanisms Regulating Feeding and Body Weight

Food Appeal: Neural Circuits Encoding Perception and Value (X3)

Mark L. Andermann, Beth Israel Deaconess Medical Center, USA
Estimation of Current and Future Physiological States in Insular Cortex

Dana M. Small, Yale University School of Medicine, USA
Orosensory Monitors of Food Reward

J. Nicholas Betley, University of Pennsylvania, USA
Converging Pain and Hunger Signals

Ryan Remedios†, Helmholtz Zentrum München, Germany
Central Circuits for Cost-Benefit Estimations in Energy Balance Regulation

Short Talks Chosen from Abstracts

Enteroendocrine Cells and Gut Hormone Signaling (X4)

Holly A. Ingraham, University of California, San Francisco, USA
Enterochromaffin Cells: Detection and Transduction of Environmental, Metabolic and Homeostatic Information from the Gut Directly to the Nervous System

Diego V. Bohórquez, Duke University Medical Center, USA
Transduction of a Sense from Gut to Brain

Short Talks Chosen from Abstracts

Poster Session 1

**TUESDAY, MARCH 16**
Food Intake and Decision-Making: Networks Promoting Food Intake in the Face of Competing Needs (X3)

Paul Glimcher†, New York University, USA
Food Craving and Decision-Making

Giovanni Marsicano, INSERM U 1215, France
Metabolic Control of Brain Functions by Cannabinoid Receptors

Sarah Garfinkel, Brighton and Sussex Medical School, UK
How Interoception Influences Affective State

Yuki Oka, California Institute of Technology, USA
Regulation of Thirst and Sodium Appetite

Short Talks Chosen from Abstracts

Signaling and the Brain (X4)

Scott M. Sternson, HHMI/Janelia Research Campus, USA
Algorhythms for Appetite

Lotte Bjerre Knudsen, Novo Nordisk A/S, Denmark
GLP-1 Signaling in the Brain

Speaker to be Announced

Speaker to be Announced

Short Talks Chosen from Abstracts

Diet-Induced Neuroinflammation and Metabolic Circuitry (X3)

Stephanie E. Fulton, University of Montreal, Canada
Neuroimmune Correlates of Diet-Induced Mood Deficits

Staci Bilbo, Duke University, USA
Microglial Signaling and Obesity Susceptibility

Cristina García Cáceres, Helmholtz Zentrum München GmbH, Germany
Disruption of Astrocyte-Neuron Crosstalk in Obesity

Short Talks Chosen from Abstracts

Mucosal Immune System (X4)

Daniel Mucida, Rockefeller University, USA
Neuro-Immune Communication in the Control of Inflammation in the Gut

Speaker to be Announced

Speaker to be Announced

Short Talks Chosen from Abstracts

Poster Session 2

**WEDNESDAY, MARCH 17**
Neurodevelopmental Programming of Feeding Behavior (X3)

Jens C. Brüning, Max Planck Institute for Metabolism Research, Germany
Maternal Nutrition and Metabolic Outcomes

* Session Chair † Invited but not yet accepted  Program current as of June 20, 2020. Program subject to change. Meal formats are based on meeting venue. For the most up-to-date details, visit https://www.keystonesymposia.org.
**KEYSTONE SYMPOSIA**
on Molecular and Cellular Biology

**Neuronal Control of Appetite (X3)**
Scientific Organizers: Richard B. Simerly, J. Nicholas Betley and Stephanie E. Fulton
Supported by the Directors' Fund

**Gut-Brain Axis (X4)**
Scientific Organizers: Ann Weber, Sarkis Mazmanian and Scott M. Sternson
March 14-17, 2021 • Keystone Resort • Keystone, CO, USA
Supported by the Directors' Fund

**Scholarship Deadline: December 1, 2020 / Abstract Deadline: December 15, 2020 / Discounted Registration Deadline: January 13, 2021**

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**Marcelo O. Dietrich**, Yale University, USA
*Ontogeny of Feeding Behavior*

**Linda Rinaman**, Florida State University, USA
*Functional Development of Ingestive Control Circuits*

**Richard B. Simerly**, Vanderbilt University, USA
*Developmental Neurobiology of Hypothalamic Sensory-Motor Integration*

**Short Talks Chosen from Abstracts**

**Microbiome (X4)**

**Speaker to be Announced**

**Rosa Krajmalnik-Brown**, Biodesign Institute at Arizona State University, USA
*Gut Microbiome in Obesity and Autism*

**John Cryan**, University College Cork, Ireland
*Interaction between Brain, Gut and Microbiome in Stress and Immune-Related Disorders*

**Fredrik Bäckhed**, University of Gothenburg, Sweden
*Gut Microbiome and the ENS in Metabolic Disorders*

**Short Talks Chosen from Abstracts**

**Gut-Brain Axis and Disease (X4)**

**Jennifer L. Gommerman**, University of Toronto, Canada
*Influence of Gut Mucosal Immune System on CNS Autoimmune Responses / Role in Multiple Sclerosis*

**Patrik Brundin**, Van Andel Institute, USA
*Role of Gut Inflammation in PD*

**Speaker to be Announced**

**Short Talks Chosen from Abstracts**

**Circadian and Environmental Impacts on Metabolism (X3)**

**Kevin D. Hall**, NIDDK, National Institutes of Health, USA
*Effects of Diet Composition on Metabolism*

**John Stuart O’Neill**, MRC Laboratory of Molecular Biology, UK
*Insulin Signalling Stimulates PERIOD Synthesis to Entrain Circadian Rhythms with Feeding Time*

**David J. Mangelsdorf**, University of Texas Southwestern Medical Center, USA
*FGF21 and Alcohol: Eat and Drink, But Don't Get too Merry*

**Kevin W. Williams**, University of Texas Southwestern Medical Center, USA
*The Effect of Exercise on Synaptic Organization in Feeding Circuits*

**Short Talks Chosen from Abstracts**

**Therapeutic Approaches (X4)**

**Charles Conway**, Washington University in St. Louis, USA
*Vagal Nerve Stimulation in Depression*

**Sarkis K. Mazmanian**, California Institute of Technology, USA
*Microbiome-Based Therapeutics for Autism*

**Ann Weber**, Kallyope, USA
*Treatment of Metabolic Disorders*

**Screen Talks Chosen from Abstracts**

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

**THURSDAY, MARCH 18**

**Departure**

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