The prevalence of diabetes mellitus is increasing worldwide and is a major threat to global public health that requires urgent action. Over the last few decades, significant advances have been made in terms of identifying novel susceptibility genes and signaling pathways that play pivotal roles in the pathogenesis of diabetes and its related metabolic disorders. However, a major gap in understanding the current global epidemic of diabetes is the lack of knowledge regarding how molecular interactions between the environment and susceptibility genes are regulated within an altered metabolic milieu. This conference will address these unresolved gaps in the etiopathogenesis of diabetes and focus on the latest advances that are linked to the molecular drivers of diabetes mellitus. Topics include: systemic regulation of adipocytes in diabetes; microvesicles, noncoding RNA and intercellular communications; physiological drivers in hunger and energy homeostasis; epigenetics and metabolic control in diabetes; novel signaling players related to insulin resistance; adaptation of beta cells to chronic metabolic stress; environmental triggers in diabetes and metabolic diseases; and molecular targets for nutrient sensing and signaling. The organizers anticipate that this meeting will bring about a major shift in addressing the causes of diabetes mellitus, as the topics emphasized in this meeting have not yet been widely explored. Through the novel diabetes research presented, this meeting should provide evidence-based insight to favorably impact people with diabetes worldwide.

Plenary Session Topics:
- Epigenetics and Metabolic Control in Diabetes
- Environmental Triggers in Diabetes and Metabolic Diseases
- Physiological Drivers in Hunger and Energy Homeostasis
- Microvesicles, Noncoding RNA and Intercellular Communications
- Novel Signaling Players Linking to Insulin Resistance
- Adaptation of Beta Cells to Chronic Metabolic Stress
- Molecular Targets for Nutrient Sensing and Signaling
- Workshop 2: Novel Therapeutic Targets for Diabetes Mellitus
- Systemic Regulation of Adipocytes in Diabetes

Scholarship/Discounted Abstract Deadline: June 25, 2018; Abstract Deadline: July 10, 2018; Discounted Registration Deadline: August 7, 2018
Visit www.keystonesymposia.org/18S1 for more details.
**KEYSTONE SYMPOSIA**  
**on Molecular and Cellular Biology**  
**Drivers of Type 2 Diabetes: From Genes to Environment (S1)**  
October 7-11, 2018 • Grand Hilton Seoul • Seoul, South Korea  
Scientific Organizers: Kyong Soo Park, Young-Bum Kim and Zoltan P. Arany  
Supported by Directors’ Fund  
Abstract & Scholarship Deadline: June 25, 2018 / Abstract Deadline: July 10, 2018 / Discounted Registration Deadline: August 7, 2018

**SUNDAY, OCTOBER 7**  
Arrival and Registration

**MONDAY, OCTOBER 8**  
**Epigenetics and Metabolic Control in Diabetes**  
*Klaus Stoffel*, ETH Zürich, Switzerland  
*Kyong Soo Park*, Seoul National University College of Medicine, South Korea  
Juleen R. Zierath, Karolinska Institutet, Sweden  
Skeletal Muscle Mediators and Exercise-Induced Adaptations  
Governing Insulin Sensitivity: Turning Back Time on Diabetes Pathogenesis  
Yoshihiro Ogawa, Kyushu University, Japan  
Role of DNA Methylation in Early Life and its Impact in Later Life  
Charlotte A. Ling, Lund University, Sweden  
Epigenetic Mechanisms Linking Environmental Factors and Type 2 Diabetes  

**Environmental Triggers in Diabetes and Metabolic Diseases**  
*Juleen R. Zierath*, Karolinska Institutet, Sweden  
*Chen-Yu Zhang*, Nanjing University, China  
Chirag J. Patel, Harvard Medical School, USA  
Challenges and Opportunities in Mapping the Exposome of Type 2 Diabetes  
Kristin L. Eckel-Mahan, University of Texas Health Science Center, USA  
Mechanisms Underlying Diet-Induced Circadian Reprogramming  
David D. Moore, Baylor College of Medicine, USA  
Regulation of Liver Energy Balance by Nutrient-Sensing Nuclear Receptors  
Raffaele Gerlini, Helmholtz Zentrum München, Germany  
Short Talk: Paternal Overweight Determines Transgenerational Glucose Intolerance via Polycomb

**Poster Session 1**

**TUESDAY, OCTOBER 9**  
**Physiological Drivers in Hunger and Energy Homeostasis**  
*Young-Bum Kim*, Harvard Medical School, USA  
*Catherine Postic*, INSERM, Institut Cochin, France  
Gary J. Schwartz, Albert Einstein College of Medicine, USA  
Gut-Brain Communication in the Integrated Control of Energy and Glucose Homeostasis  
Min-Seon Kim, University of Ulsan College of Medicine, South Korea  
Hypothalamic Inflammation in Diet-Induced Obesity  
Allison W. Xu, University of California, San Francisco, USA  
Gene-Diet Interaction in the Regulation of Energy Balance and Macronutrient Preference  
Vincent Prevot, INSERM, University of Lille, France  
Role of Hypothalamic Tanyocytes in Metabolic Homeostasis  
Henriette R. Frikke-Schmidt, University of Michigan, USA  
Short Talk: Exploring GFRAL Neuroanatomy and Function  
Qiwei Zhai, Shanghai Institute of Nutrition and Health, SIBS, CAS, China  
Short Talk: Short-Term Tamoxifen Treatment Has Long-Term Effects on Metabolism in High-Fat Diet Mice Involved with Nmnat2 in POMC Neurons

**Poster Session 2**  
**Microvesicles, Noncoding RNA and Intercellular Communications**  
*Kohjiro Ueki*, Research Institute, National Center for Global Health and Medicine, Japan  
Chen-Yu Zhang, Nanjing University, China  
Pancreatic Islet-Released miR-29 Family Members Travel to Liver and Contribute to Hepatic Insulin Resistance  
Markus Stoffel, ETH Zürich, Switzerland  
MicroRNA Networks in Metabolic Tissues

* Session Chair † Invited but not yet accepted Program current as of October 3, 2018. Program subject to change. Meal formats are based on meeting venue. For the most up-to-date details, visit [www.keystonesymposia.org/19S1](http://www.keystonesymposia.org/19S1).
Soazig Le Lay, INSERM, University of Angers, France
Extracellular Vesicles Derived from Adipocytes and Obesity-Associated Metabolic Dysfunctions

Prakash Nagarkatti, University of South Carolina, USA
Short Talk: MicroRNA-30 Regulates Pro-Inflammatory Adipose Tissue Macrophage-Polarization through Notch Signaling and Provides a Therapeutic Target for Metabolic Disease

WEDNESDAY, OCTOBER 10

Novel Signaling Players Linking to Insulin Resistance
*E. Dale Abel,* University of Iowa, Carver College of Medicine, USA
*In-Kyu Lee,* Kyungpook National University Hospital, South Korea
*Barbara B. Kahn,* Beth Israel Deaconess Medical Center, Harvard Medical School, USA

Novel Class of Signaling Lipids with Beneficial Metabolic Effects

Kohjiro Ueki, Research Institute, National Center for Global Health and Medicine, Japan
Role of Hepatic Activin B in the Control of Glucose Homeostasis

Andrew C. Adams, Eli Lilly and Company, USA
FGF21 Signaling in Insulin Action

Young-Bum Kim, Harvard Medical School, USA
ApolipoproteinJ (ApoJ) Is a Novel Regulator of Insulin Resistance

Raziel Rojas-Rodriguez, University of Massachusetts Medical School, USA

Short Talk: A Placenta-Adipose Tissue Signaling Mechanism Supports Maternal Metabolism and Protects Against Gestational Diabetes

Ara Koh, Gothenburg University, Sweden
Short Talk: Mechanistic Studies of the Impact of Microbiially Produced Histidine-Derived Metabolites on Insulin Signaling

Adaptation of Beta Cells to Chronic Metabolic Stress
*Moon-Kyu Lee,* Sungkyunkwan University School of Medicine, South Korea

*Susumu Seino,* Kobe University Graduate School of Medicine, Japan
Beta-cell Glutamate: A Critical Amplifying Signal in Insulin Secretion

Lori Sussel, University of Colorado Anschutz Medical Campus, USA
Pancreatic Beta-Cell Identity and Function in Diabetes

Yuval Dor, Hebrew University-Hadassah Medical School, Israel
The Effect of Glucose on Beta Cell Regeneration

Jinsook Son, Columbia University, USA
Short Talk: Analysis of Beta Cell Dedifferentiation using Single-Cell RNA-Seq of Human Type 2 Diabetics

Poster Session 3

THURSDAY, OCTOBER 11

Molecular Targets for Nutrient Sensing and Signaling
*Barbara B. Kahn,* Beth Israel Deaconess Medical Center, Harvard Medical School, USA

*Seung-Hoi Koo,* Korea University, South Korea

E. Dale Abel,* University of Iowa, Carver College of Medicine, USA
Autophagy and Nutrient Sensing

Zoltan P. Arany,* University of Pennsylvania, USA
Diabetes and Branched Chain Amino Acid Metabolism

Kyong Soo Park,* Seoul National University College of Medicine, South Korea
SUMO-Specific Protease 2 (SENP2) as a Novel Regulator of Fatty Acid Metabolism

Feifan Guo,* Institute for Nutritional Sciences, China
Central and Peripheral Mechanisms Underlying Glucocorticoid-Increased Adiposity

Paula Ortega-Prieto,* INSERM U1016, France
Short Talk: Importance of the OGT-ChREBP-PPARalpha Axis in Hepatic Glucose Sensing

Cholsoon Jang,* Princeton University, USA
Short Talk: Intestinal Fructose Metabolism and Fatty Liver.

Workshop 2: Novel Therapeutic Targets for Diabetes Mellitus
*Philipp E. Scherer,* University of Texas Southwestern Medical Center, USA

Bhagirath Chaurasia,* University of Utah, USA
Targeting a Double-Bond in Ceramides to Treat Insulin Resistance and Steatohepatitis

Mitz Nagarkatti,* University of South Carolina, USA
Cannabinoid Receptor 1 Blockade Attenuates Metabolic Inflammation and High-Fat Diet-Induced Obesity through Regulation of Gut Microbial Dysbiosis

Yong Jae Lee,* CKD Research Institute, South Korea
CKD-508: A New Potent Therapy for Dyslipidemia

Melissa L. Borg,* Karolinska Institutet, Sweden
CRHR2 Agonist Improves Skeletal Muscle Insulin Sensitivity and Muscle Function in Diet-Induced Obese Mice

Kyeongjin Kim,* Columbia University, USA
Kctd17, a Novel Regulator in Obesity-Induced Insulin Resistance and Fatty Liver

Sawswata Talukdar,* Merck, USA
Evolving Mechanisms and Continued Challenges of the FGF21 Pathway as a Therapeutic Agent

In-Kyu Lee,* Kyungpook National University Hospital, South Korea
PDK4 Mediates Skeletal Muscle Insulin Resistance by Increasing MAM Formation

Systemic Regulation of Adipocytes in Diabetes
*Zoltan P. Arany,* University of Pennsylvania, USA

Philipp E. Scherer,* University of Texas Southwestern Medical Center, USA
The Adipocyte in Systemic Energy Regulation

Aimin Xu,* University of Hong Kong, China
Neuroimmune Interactions in the Browning of White Adipose Tissue
David E. James, University of Sydney, Australia
New Insights into Insulin Resistance

Mark I. McCarthy, University of Oxford, UK
The Genetic and Epigenomic Architecture of Type 2 Diabetes

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

FRIDAY, OCTOBER 12

Departure