

# Keystone Symposia in Korea

# Drivers of Type 2 Diabetes: From Genes to Environment

Grand Hilton Seoul | Seoul, South Korea | October 7–11, 2018

*Held in advance of the 2018 International Congress on Diabetes and Metabolism, October 11–13, 2018*

*Scientific Organizers:*

**Kyong Soo Park**, Seoul National University College of Medicine, South Korea

**Young-Bum Kim**, Harvard Medical School, USA

**Zoltan P. Arany**, University of Pennsylvania, USA

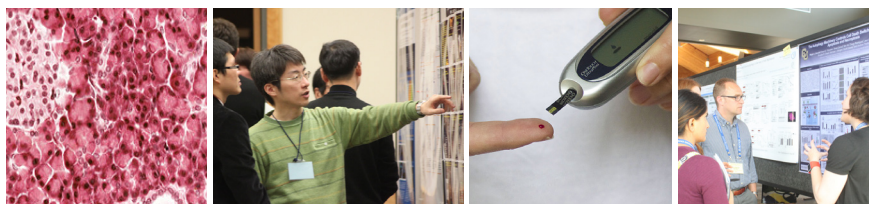
*The prevalence of diabetes mellitus is increasing worldwide and is a major threat to global public health that requires urgent action. Over the last few decades, significant advances have been made in terms of identifying novel susceptibility genes and signaling pathways that play pivotal roles in the 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](http://www.keystonesymposia.org/18S1) for more details.



**KEYSTONE SYMPOSIA™**  
on Molecular and Cellular Biology  
*Accelerating Life Science Discovery*  
**a 501(c)(3) nonprofit educational organization**

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## Drivers of Type 2 Diabetes: From Genes to Environment (S1)

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### SUNDAY, OCTOBER 7

#### Arrival and Registration

### MONDAY, OCTOBER 8

#### Epigenetics and Metabolic Control in Diabetes

\***Markus Stoffel**, ETH Zürich, Switzerland

\***Kyong Soo Park**, Seoul National University College of Medicine, South Korea

*Diabetes in Asia*

**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*

**Hyunki Kim**, Korea Advanced Institute of Science and Technology, South Korea

*Short Talk: PRMT1-Dependent Histone Arginine Methylation Regulates Mature  $\beta$  Cell Identity*

**Heshan Peiris**, Stanford University School of Medicine, USA

*Short Talk: Conditional Genetics and Human Islet Studies to Discover Diabetes Risk Gene Function*

#### Workshop 1

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

\***Allison W. Xu**, University of California, San Francisco, USA

**Yun-Hee Lee**, Yonsei University, South Korea

*Micro-Environmental Regulation of in vivo Beige Adipogenesis by Gap Junctional Interactions between Adipocyte Progenitors and Macrophages*

**Meilian Liu**, University of New Mexico Health Sciences Center, USA  
*Adipose mTORC1 Suppresses Prostaglandin Signaling and Beige Adipogenesis via the CRTC2-COX-2 Pathway*

**Hyun Cheol Roh**, Beth Israel Deaconess Medical Center, USA  
*Warming Induces Significant Reprogramming of Beige, But Not Brown, Adipocyte Cellular Identity*

**Haiyan Zhou**, Central South University, China

*DsbA-L Deficiency in CD4<sup>+</sup> T Cells Promote Diet-Induced Thermogenesis through Inhibiting IFN- $\gamma$  Production*

**Jee Hyung Sohn**, Seoul National University, South Korea

*Plin1 Deficiency Promotes Inflammatory Responses in Lean Adipose Tissue through Lipid Dysregulation*

**Samuel Klein**, Washington University School of Medicine, USA

*Does Roux-en-Y Gastric Bypass Surgery have Weight Loss Independent Therapeutic Effects on Multi-Organ Insulin Sensitivity and  $\beta$ -cell Function in People with 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 Tanycytes 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*

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**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 Microbially 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 (SEN2) 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*

**Cholsoo 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*

**Mitzi 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*

**Saswata 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*



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**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*

**Short Talk Chosen from Abstracts**

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

**FRIDAY, OCTOBER 12**

**Departure**