Small regulatory RNAs are integral players in eukaryotic gene regulation, and are involved in numerous developmental and pathological pathways. Although the field has been making remarkable progresses in recent years, it still has a number of seminal questions. We need to understand how cell signaling pathways are connected to small RNA pathways, how small RNAs are regulated and function during cell fate transition, how small RNAs interact with subcellular compartments, if and how they are transported between cells, and how small RNAs participate in immune response. We also need to gain a systemic view of small RNAs and their targets in the context of gene network, and to understand their involvements in human diseases, not just cancer but also other genetic and metabolic disorders. This conference brings together scientists studying diverse animal and plant model organisms, which will offer an opportunity to understand the mechanism and function of small RNAs in an evolutionary and physiological context. The symposium will also bridge the gaps between fundamental knowledge, clinical needs and technical development by addressing issues such as small RNA involvement in diseases, in vivo delivery of RNA and technical challenges in RNA detection at single-molecule and single-cell levels. Compared with other conferences on RNA, this conference is unique in that it focuses on small regulatory RNAs, yet it is highly diverse in research approaches and biological systems. It will serve as a central forum for the small RNA community.

Session Topics:
• MicroRNA Biogenesis and Turnover
• MicroRNA Function in Development and Stem Cells
• MicroRNA Function in Disease
• Small RNAs as Therapeutic and Diagnostic Tools
• Mechanism of RNA Silencing
• Lessons from CRISPR
• Diverse Small RNA Pathways

Scholarship/Discounted Abstract Deadline: Dec 19, 2018; Abstract Deadline: Jan 16, 2019; Discounted Registration Deadline: Feb 13, 2019

Visit [www.keystonesymposia.org/19D7](http://www.keystonesymposia.org/19D7) for more details.
SUNDAY, APRIL 14
Arrival and Registration

MONDAY, APRIL 15
Welcome and Memorial Speech for Elisa Izaurralde
*V. Narry Kim, Institute for Basic Science, South Korea
Oliver Weichenrieder, Max Planck Institute for Developmental Biology, Germany

Keynote Address
*V. Narry Kim, Institute for Basic Science, South Korea
David P. Bartel, Massachusetts Institute of Technology and Whitehead Institute, USA

MicroRNA Biogenesis and Turnover
*Anastasia Khvorova, University of Massachusetts Medical School, USA
Gunter Meister, University of Regensburg, Germany
Helge Großhans, Friedrich Miescher Institute - FMI, Switzerland
Eric C. Lai, Sloan Kettering Institute, USA
Daniel Cifuentes, Boston University, USA

Seung Cho Lee, Cold Spring Harbor Laboratory, USA
21-22 nt easiRNA-Dependent Regulation of Retrotransposition in Arabidopsis

Yuriki Sakurai, University of Tokyo, Japan
In vitro Recapitulation of the Secondary siRNA Biogenesis in Plants

MicroRNA Function in Development and Stem Cells
*Xuemei Chen, University of California, Riverside, USA
Lin He, University of California, Berkeley, USA

Anton J. Enright, University of Cambridge, UK
Detection of Subtle microRNA Binding Effects on mRNA Levels using Single-Sum Significance k-mer Analysis

Mollie K. Meffert, Johns Hopkins University School of Medicine, USA
Short Talk: Growth Regulatory miRNAs in Neuronal Function

Aishe Angeletti Sarshad, University of Gothenburg, Sweden
Short Talk: Argonaute-miRNA Complexes Silence Target mRNAs in the Nucleus of Mammalian Stem Cells

TUESDAY, APRIL 16
MicroRNA Function in Disease
*Mollie K. Meffert, Johns Hopkins University School of Medicine, USA
Stefania Nicoli, Yale University, USA

Jun-An Chen, Academia Sinica, Taiwan
The Role of MicroRNA during Motor Neuron Development and Degeneration

Anna Bludau, University of Regensburg, Germany
Short Talk: Lateral Septum miRNA Alterations in Response to Social Fear Conditioning: Functional Involvement of miR-132 in Extinction and Oxytocin-Mediated Reversal of Social Fear

Small RNAs as Therapeutic and Diagnostic Tools
*Phillip D. Zamore, University of Massachusetts Medical School, USA
Anastasia Khvorova, University of Massachusetts Medical School, USA

Karyn Schmidt, Alnylam Pharmaceuticals, USA
Mechanistic Insights and Progress on the GalNAc-siRNA Conjugate Platform for Targeted Delivery of RNAi Therapeutics to the Liver

Bastian Fromm, SciLifeLab - Stockholm
Short Talk: The Metazoan MicroRNA Complement

* Session Chair † Invited but not yet accepted     Program current as of August 11, 2019. Program subject to change. Meal formats are based on meeting venue. For the most up-to-date details, visit www.keystonesymposia.org/19D7.
Yun Sang Cho, Animal and Plant Quarantine Agency, South Korea 
Short Talk: Safety and Efficacy of Double Strand RNA against Sacbrood Virus Infection in Apis cerana

Gaspare La Rocca, Memorial Sloan Kettering Cancer Center, USA 
Short Talk: Development of a Novel Mouse Model for the Reversible, Temporally and Spatially Controlled Inhibition of miRNA Activity in vivo

Poster Session 2

WEDNESDAY, APRIL 17

Mechanism of RNA Silencing

* Mikiko C. Siomi, University of Tokyo, Japan 
* Xuemei Chen, University of California, Riverside, USA 
TREX-2 and a Nuclear Pore Protein in MicroRNA Biogenesis in Arabidopsis

Yukihide Tomari, University of Tokyo, Japan 
The 3’End Formation Mechanism of Silkworm piRNAs

Phillip D. Zamore, University of Massachusetts Medical School, USA 
An Unexpected Function for a Eubacterial Argonaute Protein

Mofang Liu, Shanghai Institutes for Biological Sciences, Chinese Academy of Sciences, China 
Multiple Roles of MIWI/piRNAs in Regulating Spermiogenesis in Mice

Daehyun Baek, Seoul National University, South Korea 
Short Talk: Most RNA-Binding Proteins are microRNA Targeting Enhancers

Shu-Huei Hsiao, National Chung Cheng University, Taiwan 
Short Talk: Loss of PIWIL4 and L1TD1 Disrupts Somatic piRNA, Methylome and Genome Stability

Larissa Nitschke, Baylor College of Medicine, USA 
Short Talk: MicroRNA 760 Regulates the Expression of Atxn1 via Interaction with its 5’Utranslated Region

Poster Session 3

Workshop 2

* Martin J. Simard, CRUCH de Québec-Université Laval, Canada 
* Lu Ya-Lin, Washington University in St. Louis, USA 
Bifunctional Role of miR-124 During Neuronal Reprogramming of Human Fibroblasts

Tuan Anh Nguyen, Hong Kong University of Science and Technology, Hong Kong 
Novel Players Regulate pri-miRNA Processing

Lei Wang, Chinese Academy of Sciences, China 
RNA Helicase AQR Cooperates with the DROSHA-DGCR8 Complex to Promote Primary microRNA Processing

Claudia Lang, Plant and Food Research, New Zealand 
A Randomized, Controlled, Cross-Over Clinical Study Investigating the Bioavailability of Dietary Fruit microRNAs (miRNAs) in Humans

Bing Yang, National Institute of Health, USA 
Identifying Essential mir-35 Targeting Sites in C. elegans

Doowon Huh, Rockefeller University, USA 
An Adaptive Stress-Induced RNA Depletion Response Mediates Codon-Based Translational Repression and Growth Suppression

Jian Lu, Peking University, China 
Drosophila tsRNAs Preferentially Suppress General Translation Machinery via Antisense Pairing and Participate in Cellular Starvation Response

Lessons from CRISPR

* Lin He, University of California, Berkeley, USA 
Yanli Wang, Chinese Academy of Sciences, China 
Class 2 CRISPR-Cas RNA-Guided Endonucleases and Inhibitors

Jin-Soo Kim, Institute for Basic Science, South Korea 
CRISPR Genome Editing

Chirilmn Joo, Delft University of Technology, Netherlands 
Single-Molecule Analysis of Fast and Accurate Target Recognition by Small RNAs

Dinshaw J. Patel, Memorial Sloan Kettering Cancer Center, USA 
Structure-based Mechanistic Insights into CRISPR-Cas Surveillance Complexes

Hidetoshi Hasuwa, Keio University School of Medicine, Japan 
Short Talk: PIWIL3 Plays an Important Role in Early Embryogenesis of Golden Hamsters

THURSDAY, APRIL 18

Diverse Small RNA Pathways I

* Helge Großhans, Friedrich Miescher Institute - FMI, Switzerland 
Mikiko C. Siomi, University of Tokyo, Japan 
pRNA Biogenesis and Functions in Drosophila

Katalin Fejes-Tóth, California Institute of Technology, USA 
The SUMO Ligase Su(var)2-10 Links piRNA-Guided Target Recognition to Chromatin Silencing and Controls Gene Expression via Establishment of H3K9 Trimethylation and Negative Feedback Regulation

Yijun Qi, Tsinghua University, China 
Transcriptional Activation by Small RNAs in Plants

JP T. Ouyang, Johns Hopkins University School of Medicine, USA 
Short Talk: Loss of Germ Granule Integrity during the Oocyte-to-Embryo Transition Disrupts Small RNA Homeostasis in Caenorhabditis elegans

Jan Schreier, Institute for Molecular Biology, Germany 
Short Talk: A Novel Sperm-Specific Compartment Secures an Argonaute Protein for Paternal Epigenetic Inheritance

Xiaorong Zhang, Chinese Academy of Science, China 
Short Talk: Exploring Active RNAi in Mitochondria to Reveal Epistatic Translational Control of mtDNA-Encoded Cytochrome C Oxidase Subunits

Meet the Editors

Steve Mao, Science, AAAS, USA 
Angela K. Eggleston, Nature Publishing Group, USA

Diverse Small RNA Pathways II

* Jun-An Chen, Academia Sinica, Taiwan
Victor R. Ambros, University of Massachusetts, USA
Developmental Regulation and Function of Let-7a microRNA in C. elegans

V. Narry Kim, Institute for Basic Science, South Korea
MicroRNA Arm Switching Regulated by Uridylation

Martin J. Simard, CRCHU de Québec-Université Laval, Canada
Short Talk: microRNAs form Distinct Silencing Complexes to Regulate their Target mRNAs Differently

Closing Keynote Address
Victor R. Ambros, University of Massachusetts, USA
Phillip A. Sharp, Massachusetts Institute of Technology, USA
Networks of microRNA in Normal and Cancer Cell States

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

FRIDAY, APRIL 19
Departure