



Join Keystone Symposia  
for the 2016 conference on:

# Small RNA Silencing: Little Guides, Big Biology

January 24–28, 2016

Keystone Resort | Keystone, Colorado | USA

Scientific Organizers:

Phillip D. Zamore, Yukihide Tomari and Mihaela Zavolan

*Small RNAs have emerged as remarkably pervasive and versatile regulators of gene expression in species ranging from viruses to animals. Although diverse in biogenesis and mode of action, these small, ~21 nucleotide riboregulators, including microRNAs, small interfering RNAs (siRNAs) and PIWI-interacting RNAs, act as guides for Argonaute proteins. As part of these ribonucleoprotein complexes, small RNAs regulate virtually every step of gene expression, playing key roles in nearly every biological process. This meeting seeks to catalyze the open exchange of ideas about the molecular mechanisms by which small RNAs are made and function, the quantitative interplay among small RNAs, between small RNAs and targets, and, ultimately, the consequences of these interactions for cellular function, in normal and pathological states. Special emphasis is placed on showcasing the work of young investigators, and on complementary approaches for studying gene regulation by small RNAs. Finally, the meeting seeks to continue the intellectually rigorous but congenial atmosphere that is the tradition of this exciting field.*

*Session Topics:*

- Small RNAs in Genome Regulation
- Workshop 1: microRNAs
- Diverse Functions of Small RNAs
- Small RNAs in Plants
- Workshop 2: piRNAs
- Mechanisms of Small RNAs
- Small RNAs in Disease and Therapy
- MicroRNAs in the Regulation of Cell Fate
- Biological Functions of Small RNAs I & II
- Workshop 3: Emerging Technologies and Computational Modeling



Submitting an abstract is a great way of participating in the conference through poster presentation and possible selection for a short talk.

**Scholarship & Discounted Abstract Deadline: Sep 28, 2015**

**Abstract Deadline: Oct 28, 2015**

**Discounted Registration Deadline: Nov 23, 2015**

For additional details, visit [www.keystonesymposia.org/16A6](http://www.keystonesymposia.org/16A6).

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### SUNDAY, JANUARY 24

#### Arrival and Registration

### MONDAY, JANUARY 25

#### Welcome and Keynote Address

\***Phillip D. Zamore**, University of Massachusetts Medical School, USA

**Julius Brennecke**, IMBA - Institut für Molekulare Biotechnologie GmbH, Austria

*The piRNA Pathway - A Small RNA Based Genome Defense System*

#### Small RNAs in Genome Regulation I

\***Celina Juliano**, University of California, Davis, USA

**Danesh Moazed**, Harvard Medical School, USA  
*Heterochromatic Gene Silencing by small RNAs in *S. pombe**

**Kuniaki Saito**, National Institute of Genetics, Japan  
*Short Talk: Piwi Promotes Transcriptional Silencing by Regulating Chromatin Compaction*

**Maria Placentino**, Institute of Molecular Biology, Germany  
*Short Talk: Maternal piRNAs are Essential for Germline Development Following de-novo Establishment of Endo-siRNAs in *Caenorhabditis elegans**

**Alexei A. Aravin**, California Institute of Technology, USA  
*Genome Defense by piRNA*

#### Workshop 1: miRNAs

\***Martin J. Simard**, CRCHU de Québec-Université Laval, Canada

**Amy E. Pasquinelli**, University of California, San Diego, USA  
*Distinct Targeting by Let-7 miRNA Family Members*

**Natalia Pinzon**, Centre National de la Recherche Scientifique, France  
*Titration of miRNAs by mRNAs: A Novel Function for Conserved miRNA Binding Sites*

**Matteo Osella**, Università degli Studi di Torino, Italy  
*Modelling microRNA Regulation and its Role in Noise Buffering*

**Francesco Nicassio**, Istituto Italiano di Tecnologia, Italy  
*Insights into Function and Regulation of MicroRNAs by Decoding Degradation Dynamics*

**Yukihide Tomari**, University of Tokyo, Japan  
*Biochemical and Genetic Approaches to Understanding the MicroRNA Pathway*

#### Small RNAs in Genome Regulation II

\***Katalin Fejes-Tóth**, California Institute of Technology, USA

**Michael Terns**, University of Georgia, USA  
*RNA-Guided Invader Defense: CRISPR-Cas Systems*

**Yijun Qi**, Tsinghua University, China  
*Small RNAs and Genome Stability*

**Fabrizio d'Adda di Fagagna**, IFOM Foundation, National Research Council, Italy  
*Short Talk: RNA: RNA Interactions Control the DNA Damage Response at Individual Genomic Sites*

**William Theurkauf**, University of Massachusetts Medical Center, USA  
*Gene Conversion Drives Non-Mendelian Inheritance of Transposons and piRNA Clusters in *Drosophila melanogaster**

#### Poster Session 1

### TUESDAY, JANUARY 26

#### Diversity of RNA Regulation

\***Olivia Rissland**, University of Colorado School of Medicine, USA

**David C. Baulcombe**, University of Cambridge, UK  
*RNA Silencing in Plants*

**Michael J. Axtell**, Pennsylvania State University, USA  
*Small RNA-Producing Genes in Plants: Improved Methods and Novel Discoveries*

**Xuemei Chen**, University of California, Riverside, USA  
*AMP1, ER, and small RNAs*

**Michel J. Tassetto**, University of California, San Francisco, USA  
*Short Talk: Circulating Immune Cells Mediate the Amplification and Memory of a Systemic Nucleic Acid-Based Antiviral Response in *Drosophila**

**Valeria Yartseva**, Yale University School of Medicine, USA  
*Short Talk: The Hidden Code Behind the Genetic Code: Codon Optimality Regulate mRNA Translation and Stability*

**David P. Bartel**, HHMI, MIT and Whitehead Institute, USA  
*miRNA-Mediated Gene Regulation*

#### Workshop 2: piRNAs

\***Julie M. Claycomb**, University of Toronto, Canada

**Mikiko C. Siomi**, University of Tokyo, Japan  
*piRNA Biogenesis in *Drosophila**

**Mofang Liu**, Shanghai Institutes of Biological Sciences, Chinese Academy of Sciences, China  
*Male Infertility Caused by Ubiquitination-deficient Mutations in Human Piwi (Hiwi)*

**Eric A. Miska**, University of Cambridge, UK  
*Transgenerational Epigenetic Inheritance and RNAe*

**Zsolt Gabor Venkei**, University of Michigan, USA  
*The Role of Kinesin in piRNA Pathway in *Drosophila melanogaster* Testis*

**Phillip D. Zamore**, University of Massachusetts Medical School, USA  
*piRNAs*

#### Mechanisms of Small RNAs

\***Jinbiao Ma**, Fudan University, China

**V. Narry Kim**, Institute for Basic Science, South Korea  
*Primary MicroRNA Processing by DROSHA*

**Ian MacRae**, The Scripps Research Institute, USA  
*Structure and Mechanism of Argonaute Proteins*

**Fuguo Jiang**, University of California, Berkeley, USA  
*Short Talk: A Cas9-Guide RNA Complex Pre-Organized for Target DNA Recognition*

**Kotaro Nakanishi**, Ohio State University, USA  
*Structural and Functional Insights into Mechanisms of Argonaute Proteins*

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### Poster Session 2

#### WEDNESDAY, JANUARY 27

##### Small RNAs in Disease and Therapy

\***Nicole Deglon**, Lausanne University Hospital, Switzerland

**Anastasia Khvorova**, University of Massachusetts Medical School, USA

*Expanding Chemical Diversity of Therapeutic Oligonucleotides for Treatment of Neurodegenerative Disorders*

**Si-ping Han**, California Institute of Technology, USA

*Short Talk: Towards Selective Treatment of Diseased Cells via RNA Transcript Activated Conditional-siRNAs*

**Muthiah Manoharan**, Alnylam Pharmaceuticals, Inc., USA

*Therapeutic siRNAs for Human Disease*

**David M. Rodman**, miRagen Therapeutics, USA

*Therapeutic Targeting of microRNAs*

**Fumikazu Shinohara**, Kyowa Hakko Kirin Co., Ltd., Japan

*Short Talk: Modifications at 5' End of siRNA Guide Strand Increase siRNA-AGO2 Binding and siRNA Efficacy*

**Socheata Ly**, University of Massachusetts Medical School, USA

*Short Talk: Visualization of Self-delivering Hydrophobically Modified siRNA Cellular Internalization*

**Robert A. Martienssen**, Cold Spring Harbor Laboratory, USA

*Heterochromatin Reprogramming with Small RNA*

##### MicroRNAs in the Regulation of Cell Fate I

\***Olivia Rissland**, University of Colorado School of Medicine, USA

**Donal O'Carroll**, University of Edinburgh, UK

*Differential Importance of Tut4/7-Mediated Uridylation in vivo*

**Victor R. Ambros**, University of Massachusetts, USA

*MicroRNAs in Worm Development*

**Chao-Po Lin**, University of California, Berkeley, USA

*Short Talk: Deficiency of microRNA miR-34a Expands Cell Fate Potential in Pluripotent Stem Cells*

**Richard W. Carthew**, Northwestern University, USA

*Study of the Mechanism and Function of microRNAs in Drosophila*

### Poster Session 3

#### THURSDAY, JANUARY 28

##### MicroRNAs in the Regulation of Cell Fate II

\***Alena Shkumatava**, Institut Curie-Centre de Recherche, France

**Helge Großhans**, Friedrich Miescher Institute - FMI, Switzerland

*MicroRNA Function in Vivo: Biology and Regulation*

**Carrie B. Wiese**, Vanderbilt University, USA

*Short Talk: Myeloid-Originating miR-223 Regulates Systemic Glucose and Cholesterol via HDL Intercellular Communication*

**Markus Stoffel**, ETH Zürich, Switzerland

*miR-7 is an Essential Regulator of Endocrine Function*

**Anne M. Delany**, University of Connecticut Health, USA

*Short Talk: MicroRNA Regulation of Circadian Rhythm in the Osteoblastic Lineage*

**Stefanie Dimmeler**, University of Frankfurt, Germany

*miRNAs in the Cardiovascular System*

**Nikolaus Rajewsky**, Max Delbrück Center for Molecular Medicine, Germany

*Regulatory RNAs*

##### Workshop 3: Emerging Technologies and Computational Modeling

\***Eric C. Lai**, Sloan-Kettering Institute, USA

**Zhiping Weng**, University of Massachusetts, USA

*New Computational Methods for Understanding Gene Regulation by Small RNAs*

**Andrea Riba**, University of Basel, Switzerland

*Explicit Modeling of siRNA Off-Targets Improves the Recovery of Gene Specific Contribution to Phenotypes*

**Stefan L. Ameres**, Institute of Molecular Biotechnology, Austria

*Kinetic Analysis of Small RNA Silencing Pathways in Living Cells*

**Daniel Cifuentes**, Boston University, USA

*Uncovering the RNA-Protein Interaction Network that Control Vertebrate Embryogenesis*

**Mihaela Zavolan**, Biozentrum, University of Basel, Switzerland

*Exploiting Single Cell Level Heterogeneity to Uncover in Vivo Hierarchies of miRNA Targets*

##### Small RNAs in Worms

\***René F. Ketting**, Institute for Molecular Biology, Germany

**Andrew Fire**, Stanford University, USA

*Continuing Education of the Small RNA-ome: Some Mechanisms by which Cells Alter (and Maintain) their Repertoires of Effector RNAs*

**Gary B. Ruvkun**, Massachusetts General Hospital, Harvard Medical School, USA

*C. elegans Silencing Specializations*

**Craig C. Mello**, University of Massachusetts Medical School, USA

*RNA-Guided Genome Surveillance*

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

#### FRIDAY, JANUARY 29

##### Departure