



# Precision Genome Editing with Programmable Nucleases

January 28–February 1, 2018 | Keystone Resort | Keystone, Colorado | USA

## Scientific Organizers:

**Jin-Soo Kim**, Seoul National University, South Korea

**Feng Zhang**, Broad Institute of MIT and Harvard University, USA

**Daniel F. Voytas**, University of Minnesota, USA

*Genome editing refers to the use of programmable DNA-targeting platforms to manipulate genetic and epigenetic information in living cells and organisms. Genome editing has been recently democratized by the development of RNA-guided endonucleases repurposed from CRISPR-Cas microbial defense systems against viruses or plasmids. Whereas novel tools such as Cpf1 and RNA-guided deaminases are being developed to expand the scope of genome editing, old tools such as ZFNs and TALENs are likely to undergo innovations as well. These tools enable genome-wide genetic screens in cell lines and genetic studies in both model and non-model organisms. Furthermore, genome editing holds great promise for broad applications in medicine and biotechnology, raising public interest and concerns. Yet genome editing is still limited by many factors such as inefficient delivery in vivo, off-target effects, and unwanted, alternative DNA repair. This conference offers opportunities to learn about new developments, advancements and applications in this fast-moving field.*

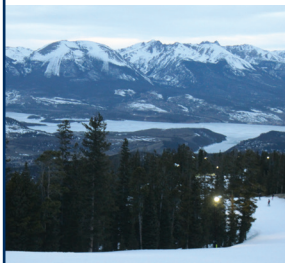
## Session Topics:

- DNA Repair and Genome Editing
- Genome Editing Methods and Novel Tools I & II
- Epigenome Editing and Gene Regulation
- Genetic Screening via CRISPR
- Therapeutic Genome Editing
- Plant and Animal Biotechnology
- Human Germline Editing and ELSI

**Scholarship Application & Discounted Abstract Deadline: October 3, 2017**

**Abstract Deadline: November 1, 2017**

**Discounted Registration Deadline: December 5, 2017**



Note: Scholarships are available for graduate students and postdoctoral fellows and are awarded based on the abstract submitted. Submitting an abstract is an excellent opportunity to gain exposure for your work. Abstracts submitted by the abstract deadline will also be considered for short talks on the program.

Meeting Hashtag: #KSgenome  
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# KEYSTONE SYMPOSIA

on Molecular and Cellular Biology

## Precision Genome Editing with Programmable Nucleases (B1)

January 28-February 1, 2018 • Keystone Resort • Keystone, Colorado, USA

Scientific Organizers: Jin-Soo Kim, Feng Zhang and Daniel F. Voytas

Sponsored by AstraZeneca and Sangamo Therapeutics, Inc.

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### SUNDAY, JANUARY 28

#### Arrival and Registration

### MONDAY, JANUARY 29

#### Welcome and Keynote Address

**Jennifer A. Doudna**, HHMI/University of California, Berkeley, USA  
*Talk Title to be Announced*

#### DNA Repair and Genome Editing

##### Speaker to be Announced

**Maria Jasin**, Memorial Sloan Kettering Cancer Center, USA  
*Talk Title to be Announced*

**Eric A. Hendrickson**, University of Minnesota Medical School, USA  
*The Mechanism of Cas9/CRISPR-Initiated Genome Modification*

**Eugene V. Koonin**, National Institutes of Health, USA  
*Prediction of New CRISPR-Associated Protein Functions*

#### Genome Editing Methods and Novel Tools I

**Feng Zhang**, Broad Institute of MIT and Harvard University, USA  
*Genome Editing with Cas9 and Cpf1*

**David R. Liu**, Harvard University, USA  
*Programmable Editing of a Target Base in Genomic DNA without Double-Stranded DNA Cleavage*

**J. Keith Joung**, Massachusetts General Hospital, USA  
*Defining, Optimizing, and Modifying the Activities and Specificities of Genome-Editing Nucleases*

**Short Talk Chosen from Abstracts**

#### Poster Session 1

### TUESDAY, JANUARY 30

#### Genome Editing Methods and Novel Tools II

**Scot A. Wolfe**, University of Massachusetts Medical School, USA  
*DNA-Binding-Domain Fusions Enhance the Targeting Range and Precision of Cas9*

**Jin-Soo Kim**, Seoul National University, South Korea  
*Genome Editing in Human Stem Cells, Animals, and Plants*

**Jacob E. Corn**, University of California, Berkeley, USA  
*Molecular Mechanisms of Genome Editing*

**Keiji Nishida**, Kobe University, Japan  
*Genome Editing with Non-Nuclease Modifiers in Bacteria to Plants*  
**Short Talk(s) Chosen from Abstracts**

#### Epigenome Editing and Gene Regulation

**Charles Gersbach**, Duke University, USA  
*Epigenome Editing for Gene Therapy and Disease Modeling*

**Lei (Stanley) Qi**, Stanford University, USA  
*CRISPRi and CRISPRa Mediated Screens*

**Jennifer Mitchell**, University of Toronto, Canada  
*Uncovering Distal Regulatory Element Function using CRISPR Genome Engineering*

**Short Talk Chosen from Abstracts**

#### Poster Session 2

### WEDNESDAY, JANUARY 31

#### Genetic Screening via CRISPR

**David M. Sabatini**, Whitehead Institute for Biomedical Research, USA  
*An Essential Role of the Mitochondrial Electron Transport Chain in Cell Proliferation Is to Enable Aspartate Synthesis*

**Reuven Agami**, Netherlands Cancer Institute, Netherlands  
*Genetic Screens for Non-Coding Elements*

**Neville Sanjana**, New York Genome Center & NYU, USA  
*New Frontiers for Pooled Screens: Finding Regulatory Elements in the Noncoding Genome and Capturing Multi-Cell Interactions*

**Danwei Huangfu**, Memorial Sloan-Kettering Cancer Institute, USA  
*Genetic Screens in Human Pluripotent Stem Cells*

**Short Talk(s) Chosen from Abstracts**

#### Therapeutic Genome Editing

**Edward J. Rebar**, Sangamo Therapeutics, Inc., USA  
*Engineering Zinc Finger Nucleases for Therapeutic Applications*

**Amy J. Wagers**, Harvard University, USA  
*In vivo Gene Editing in Muscle and Muscle Stem Cells*

**Charles F. Albright**, Editas Medicine, USA  
*Genome Editing for the Treatment of Genetic Diseases*

**Short Talk Chosen from Abstracts**

#### Poster Session 3

### THURSDAY, FEBRUARY 1

#### Plant and Animal Biotechnology

**Dan Carlson**, Recombinetics, Inc., USA  
*Animal Genome Editing*

**Caixia Gao**, Chinese Academy of Sciences, China  
*Precise Plant Engineering with Genome Editing Tools*

**Daniel F. Voytas**, University of Minnesota, USA  
*Crop Improvement Using TALENs*

**Weizhi Ji**, Kunming University of Science and Technology, China  
*Precise Gene Editing in Non-Human Primates*

**Short Talk(s) Chosen from Abstracts**

#### Human Germline Editing and ELSI

**Kathy K. Niakan**, Francis Crick Institute, UK  
*Genetic Editing for Studying Early Human Embryonic Development*

**Shoukrat Mitalipov**, Oregon Health & Science University, USA  
*Human Germline Gene Correction*

**Tetsuya Ishii**, Hokkaido University, Japan  
*The Potential Guidelines for Germline Genome Editing in Clinics*

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

### FRIDAY, FEBRUARY 2

#### Departure