



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.

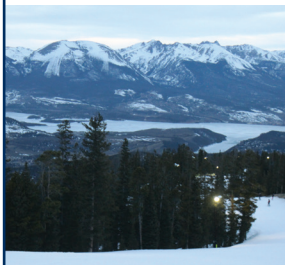
Session Topics:

- 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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Sponsored by Editas Medicine, Regeneron Pharmaceuticals, Inc., Sangamo Therapeutics, Inc. and Vertex Pharmaceuticals Incorporated

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SUNDAY, JANUARY 28

Arrival and Registration

MONDAY, JANUARY 29

Welcome and Keynote Address

***Jin-Soo Kim**, Institute for Basic Science, South Korea

Jennifer A. Doudna, HHMI/University of California, Berkeley, USA
CRISPR Systems: Nature's Toolkit for Genome Editing

DNA Repair and Genome Editing

***Jacob E. Corn**, ETH in Zurich, Switzerland

Maria Jasin, Memorial Sloan Kettering Cancer Center, USA
Protecting the Genome by Homologous Recombination

Eric A. Hendrickson, University of Minnesota Medical School, USA
The Mechanisms of Precise Genome Editing Using Oligonucleotide Donors

Eugene V. Koonin, National Institutes of Health, USA
CRISPRICITY: A Metric for Measuring CRISPR Association and a Comprehensive Census of Cas Proteins

Chance Meers, Georgia Institute of Technology, USA
Short Talk: Transcript-RNA from an Actively Transcribed Gene Accurately Repairs a DNA Double-Strand Break via a Homology-Driven Mechanism

Anastasia Lomova, University of California, Los Angeles, USA
Short Talk: Improving Gene Editing by Temporal Control of DNA Repair

NIH Somatic Cell Genome Editing Program: Overview

***Elizabeth Wilder**, National Institutes of Health, USA

Workshop: Easi-CRISPR: CRISPRing Made Easier

***C.B. Gurumurthy**, University of Nebraska Medical Center, USA

Genome Editing Methods and Novel Tools I

Jonathan Samuel Gootenberg, Harvard University, USA
Expanding the Genome Editing Toolbox by Harnessing Microbial Diversity

David R. Liu, Broad Institute, HHMI, and Harvard University, USA
Base Editing: Chemistry on a Target Nucleotide in the Genome of Living Cells

J. Keith Joung, Massachusetts General Hospital, USA
Efficient Gene Editing and Gene Regulation Using CRISPR-Cpf1 Nuclease Technology

Evan August Boyle, Stanford University, USA
Short Talk: High-Throughput Biochemical Profiling of dCas9 Association and Dissociation Kinetics Uncovers New Rules for Off-Target Binding

Poster Session 1

TUESDAY, JANUARY 30

Genome Editing Methods and Novel Tools II

***Charles Gersbach**, Duke University, USA

Scot A. Wolfe, University of Massachusetts Medical School, USA
Orthogonal Cas9-Cas9 Fusions Provide a Versatile Platform for Precise Genome Editing

Jin-Soo Kim, Institute for Basic Science, South Korea
Genome-Wide Target Specificities of CRISPR Nucleases and Deaminases

Jacob E. Corn, ETH in Zurich, Switzerland
Discovery of Stimulation-Responsive Immune Enhancers with CRISPR Activation

Keiji Nishida, Kobe University, Japan
Genome Editing with Non-Nuclease Editors from Bacteria to Plants

Alister Funnell, Altius Institute for Biomedical Sciences, USA
Short Talk: High-Scale in situ Functional Mapping and Quantitative Engineering of Regulatory DNA

Omar Abudayyeh, Massachusetts Institute of Technology, USA
Short Talk: Harnessing RNA Targeting CRISPR Systems for Transcriptome Engineering and Human Health

Epigenome Editing and Gene Regulation

***Scot A. Wolfe**, University of Massachusetts Medical School, USA

Charles Gersbach, Duke University, USA
Epigenome Editing for Gene Therapy, Cell Programming and Functional Epigenomics

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

Joseph M. Miano, University of Rochester, USA
Short Talk: CRISPR Interrogation of Regulatory Sequence Function in Mice

Chris Richardson, University of California, Berkeley, USA
Short Talk: The Fanconi Anemia Pathway Plays a Key Role in Templated Repair at CRISPR-Cas9 Cut Sites

Poster Session 2

WEDNESDAY, JANUARY 31

Genetic Screening via CRISPR

***Edward J. Rebar**, Sangamo Therapeutics, Inc., USA

Randall J. Platt, ETH Zurich, Switzerland
CRISPR Screening Directly in vivo

Reuven Agami, Netherlands Cancer Institute, Netherlands
Functional Genetic Screens of Regulatory DNA 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
Human Development and Disease through the Lens of Pluripotent Stem Cells

Bushra Raj, Harvard University, USA
Short Talk: Single-Cell Transcriptional Profiling Coupled with Lineage Tracing via Mutable Barcodes in the Vertebrate Brain

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Jason D. Arroyo, Pfizer, USA

Short Talk: Using Human Genetics and Functional Genomics for a Locus-to-Gene Approach to Drug Target Validation

FRIDAY, FEBRUARY 2

Departure

Panel: Somatic Cell Genome Editing Program: Discussion with NIH

***Timothy LaVaute**, NINDS, National Institutes of Health, USA

Therapeutic Genome Editing

***Randall J. Platt**, ETH Zurich, Switzerland

Edward J. Rebar, Sangamo Therapeutics, Inc., USA

Therapeutic Genome Editing and Gene Regulation Using Designed Zinc Finger Proteins

Amy J. Wagers, Harvard University, USA

In vivo Gene Editing in Muscle and Muscle Stem Cells

Charles F. Albright, Editas Medicine, USA

Development of a Subretinally-Delivered, CEP290-Specific CRISPR Medicine for the Treatment of Leber Congenital Amaurosis 10 (LCA10)

Pavitra Roychoudhury, University of Washington, USA

Short Talk: Rational Design and Evaluation of CRISPR/Cas9 Strategies for HIV Cure

Poster Session 3

THURSDAY, FEBRUARY 1

Plant and Animal Biotechnology

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

Dan Carlson, Recombinetics, Inc., USA

Large Animal Genome Editing for Agriculture and Biomedicine

Caixia Gao, Chinese Academy of Sciences, China

Genome Editing with Programmable Nucleases in Crop Plants

Daniel F. Voytas, University of Minnesota, USA

Editing the Plant Genome

Weizhi Ji, Kunming University of Science and Technology, China

Primate Gene Editing and Human Complex Disease Study

Mariette E.S. Andersson, Swedish University of Agricultural

Sciences, Sweden

Short Talk: CRISPR-Cas9 Takes Several Bites in the Potato Genome- Efficient Targeted Multiallelic Mutagenesis in Tetraploid Solanum tuberosum

Asim Ahmad Beg, University of Michigan, USA

Short Talk: A Rapid and Facile C. elegans Genome Engineering Pipeline Using CRISPR/Cas9 Ribonucleoproteins

Human Germline Editing and ELSI

***Jin-Soo Kim**, Institute for Basic Science, South Korea

Kathy K. Niakan, Francis Crick Institute, UK

Genome Editing Reveals a Role for OCT4 in Human Embryogenesis

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)