

KEYSTONE SYMPOSIA

on Molecular and Cellular Biology

Precision Genome Engineering and Synthetic Biology (A1)

January 11-16, 2015 • Big Sky Resort • Big Sky, Montana, USA

Scientific Organizers: Philip D. Gregory, Jennifer A. Doudna and Ron Weiss

Sponsored by Regeneron Pharmaceuticals, Inc.

Abstract & Scholarship Deadline: September 22, 2014 / Abstract Deadline: October 14, 2014 / Discounted Registration Deadline: November 11, 2014

SUNDAY, JANUARY 11

Registration

MONDAY, JANUARY 12

Keynote Address

Rodolphe Barrangout†, North Carolina State University, USA
Bacterial Immunity: CRISPR/Cas9 Systems

Editing and Control at Whole-Genome Scale: The Challenge

Feng Zhang, Broad Institute of MIT and Harvard University, USA
Application of the CRISPR/TALENs

Jennifer A. Doudna, HHMI/University of California, Berkeley, USA
Mechanisms of DNA Targeting by CRISPR Systems

J. Keith Joung, Massachusetts General Hospital, USA
Genome and Epigenome Editing Using Engineered CRISPR and TALE Technologies

Short Talk(s) Chosen from Abstracts

Workshop 1: From Target to Result: Building, Validating and Measuring your Genome Editing Outcome

Short Talks Chosen from Abstracts

Design Principles and Practice of Basic Parts to Large Scale Circuits

Domitilla Del Vecchio, Massachusetts Institute of Technology, USA
Modularity and Retroactivity in Synthetic Gene Networks

Christopher Voigt, Massachusetts Institute of Technology, USA
Programmable Cell Technologies

Adam P. Arkin†, University of California Berkeley, USA
Engineering with RNA for Scalable Circuit Design

Short Talk Chosen from Abstracts

Poster Session 1

TUESDAY, JANUARY 13

Beyond On-and-Off: Analog Circuits, Non-Transcriptional Regulation

Timothy K. Lu, Massachusetts Institute of Technology, USA
Synthetic Circuits Integrating Analog and Digital Computing in Living Cells

Christina D. Smolke†, Stanford University, USA
RNA Multi-Input Logic Devices and Applications

Andrew D. Ellington, University of Texas at Austin, USA
Altering the Translation Apparatus and Developing Modular Nucleic Acid Software

Wendell A. Lim†, University of California, San Francisco, USA
Protein Regulatory Devices and Protein Circuit Engineering

Short Talk(s) Chosen from Abstracts

Found in Translation: Disease Modeling in Cells and Animals

Jeanne Bentley Lawrence†, University of Massachusetts, USA
Translating Dosage Compensation for Correction of Down's Syndrome

Howard J. Jacob†, Medical College of Wisconsin, USA
Genome-Edited Rats as Models for Human Disease

Jacquie Niles, Massachusetts Institute of Technology, USA
Gene Regulatory Devices for Malaria

Short Talk Chosen from Abstracts

Poster Session 2

WEDNESDAY, JANUARY 14

The Genome-Edited Cell as a Window onto Biological Mechanism

Dana Carroll, University of Utah School of Medicine, USA
Parameters Affecting ZFN- and TALEN-Mediated Gene Targeting

Maria Jasin, Memorial Sloan-Kettering Cancer Center, USA
Mechanisms of DSB Repair

Rudolf Jaenisch†, Whitehead Institute for Biomedical Research, USA
Genome Editing of Stem Cells and Mice

Speaker to be Announced

Short Talk(s) Chosen from Abstracts

Health 2025: On the Path to the Clinic

Martin Fussenegger, ETH Zürich, Switzerland
Mammalian Synthetic Biology Circuits and Applications

Bruce R. Conklin, University of California, San Francisco, USA
Precise Genome Engineering Disease Phenotypes in Human iPS Cells

Paula M. Cannon, University of Southern California, Keck School of Medicine, USA
Using Targeted Nucleases to Create an HIV Resistant Immune System

Short Talk Chosen from Abstracts

Poster Session 3

THURSDAY, JANUARY 15

Protein, Enzyme and Metabolic Engineering: "Tools and Fuels"

Jay D. Keasling†, University of California, Berkeley, USA
At the Intersection of Synthetic Biology and Metabolic Engineering

David Baker†, University of Washington, USA
Rational Computer-Aided de novo Protein Design for Binding and Function

Kristala Jones Prather, Massachusetts Institute of Technology, USA
Programmed Gene Regulation for Metabolic Networks

Michelle C. Chang†, University of California, Berkeley, USA
Designing New Biosynthetic Pathways for in vivo Cellular Production of Biofuels and Pharmaceuticals

Short Talk(s) Chosen from Abstracts

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Workshop 2: BioCAD Tool: Design and Mapping to Biological Circuits

Short Talks Chosen from Abstracts

Earth 2025: The Edited Life Forms for a Better World

Speaker to be Announced

German Spangenberg[†], La Trobe University, Australia

Genome Editing in Agriculture - Next Generation Crops

Scott C. Fahrenkrug[†], University of Minnesota, USA

Genome Editing in Livestock

Short Talk Chosen from Abstracts

FRIDAY, JANUARY 16

Departure