Mobile Genetic Elements and Genome Plasticity

February 11–15, 2018 | Eldorado Hotel | Santa Fe, New Mexico | USA

Scientific Organizers:
Marlene Belfort, University of Albany, SUNY, USA
Evan E. Eichler, HHMI/University of Washington, USA
Henry L. Levin, National Institutes of Health, USA
Lynne E. Maquat, University of Rochester Medical Center, USA

Transposable elements are potent sources of genetic variation that also regulate the expression of large gene networks. They constitute the majority of genomic DNA in many eukaryotes, and they dramatically shape genetic content by causing insertions, deletions, rearrangements and sequence duplications. Of increasing significance is the link of these mobile elements to diseases such as cancer and neurodegeneration.Sequencing of human populations demonstrates that active transposable elements are substantially more prevalent than previously appreciated. The aims of this conference are to: 1) Apply recent innovations in high-throughput sequencing and genome analysis to the study of transposon biology and genome dynamics; 2) Discuss the discovery of cellular systems that inhibit transposon activity as examples of the evolutionary arms race between mobile DNA and their hosts; 3) Describe active transposition during neurogenesis and in tumor cells and raise questions about the role of mobile DNA in brain development and cancer; and 4) Discern mechanistic aspects of element mobility from bacteria to humans. This symposium is designed to foster ties between leaders in the field of transposon function and biology with the pioneers of genome analysis, a link that is still tenuous and nascent. Discussions of transposon activity and genome dynamics will focus on mechanistic models. Methods applied to these problems will include molecular structures, biochemistry, expression studies and bioinformatic analyses. The transposons and hosts represented in this conference include diverse examples from eubacteria, archaea, protists, plants and mammals.

Session Topics:
- Mechanisms and Results of Genome Editing
- Workshop 1: Genome Editing Tools and Computational Methods
- Dynamics of Plasticity
- Taming Mobile DNA Activity: Self and Non-Self Recognition
- The Action of Mobile DNA in the Brain and in Cancer
- Regulation and Biological Impact of Mobile Elements
- Genome Structural Variation
- Retrotransposition and Gene Regulation
- LINE1 Dances and Transposon Architecture

plus one workshop

Scholarship Application & Discounted Abstract Deadline: October 12, 2017
Abstract Deadline: November 14, 2017
Discounted Registration Deadline: December 14, 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: #KSmobilegen
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on Molecular and Cellular Biology

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Supported by the Directors' Fund

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SUNDAY, FEBRUARY 11

Arrival and Registration

MONDAY, FEBRUARY 12

Welcome and Keynote Address

Feng Zhang, Broad Institute of MIT and Harvard University, USA
Mining Microbial Diversity for Genome Editing

Mechanisms and Results of Genome Editing

Laura Landweber, Columbia University, USA
RNA-Programmed Genome Rearrangements in the Ciliate Oxytricha

Josh T. Dubnau, Stony Brook University, USA
Retrotransposon Activation Contributes to non-cell autonomous Neurodegeneration in a Drosophila TDP-43 Model of ALS

Mitchell R. O'Connell, University of Rochester Medical Center, USA
Targeting RNA using CRISPR-Cas Enzymes

Short Talk(s) Chosen from Abstracts

Poster Session 1

Workshop 1: Genome Editing Tools and Computational Methods

Short Talks Chosen from Abstracts

Dynamics of Plasticity

Marlene Belfort, University of Albany, SUNY, USA
Mobile Self-Splicing Introns and Inteins as Stress Sensor

John M. Abrams, University of Texas Southwestern Medical Center, USA
p53 and the Game of Transposons

Lingling Chen, Shanghai Institutes for Biological Sciences, Chinese Academy of Sciences, China
Biogenesis of Circular RNAs

Short Talk Chosen from Abstracts

TUESDAY, FEBRUARY 13

Taming Mobile DNA Activity: Self and Non-Self Recognition

Shiv I. S. Grewal, NCI, National Institutes of Health, USA
Epigenetic Genome Control by Non-Coding RNAs and RNA Processing Factors

R. Keith Slotkin, Ohio State University, USA
Initiation of TE Silencing: How the cell recognizes and triggers transposable elements for trans-generational epigenetic silencing

Brenda L. Bass, University of Utah, USA
Self versus non-self: Is that my double-stranded RNA or yours?

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

Short Talk(s) Chosen from Abstracts

The Action of Mobile DNA in the Brain and in Cancer

Geoffrey J. Faulkner, Queensland Brain Institute, Australia
Hot Donor L1s in Mammalian Somatic Cells

Haig H. Kazazian, Johns Hopkins University School of Medicine, USA
Somatic L1 Retrotransposition in Cancers and their Normal Tissues

Kathleen H. Burns, Johns Hopkins University School of Medicine, USA
Roles for Mobile Elements in Human Disease

Short Talk Chosen from Abstracts

Poster Session 2

WEDNESDAY, FEBRUARY 14

Regulation and Biological Impact of Mobile Elements

Cedric Feschotte, Cornell University, USA
Transposable Elements as Catalysts of Convergent Evolution

Ruth Lehmann, New York University School of Medicine, USA
Regulation of Transposon Splicing by piRNA-Mediated Repressive Chromatin

Lynne E. Maquat, University of Rochester Medical Center, USA
Evidence For Convergent Evolution of SINE-Directed Staufen-Mediated mRNA Decay

Henry L. Levin, National Institutes of Health, USA
Transposable Element Integration Rewires Regulatory Networks to Protect Cells Against Stress

Short Talk(s) Chosen from Abstracts

Genome Structural Variation

Evan E. Eichler, HHMI/University of Washington, USA
Dynamic Duplications and Primate Genome Evolution

Fred (Rusty) H. Gage, The Salk Institute for Biological Studies, USA
Retroelements in Brain, Behavior and Evolution

Christopher A. Walsh, Children's Hospital Boston, USA
L1 Retrotransposition and Somatic Mutation in the Human Brain

Short Talk Chosen from Abstracts

Poster Session 3

THURSDAY, FEBRUARY 15

Retrotransposition and Gene Regulation

Joanna Wysocka, Stanford University School of Medicine, USA
Intrinsic Retroviral Reactivation in Human Preimplantation Embryos and Pluripotent Cells

M. Joan Curcio, Wadsworth Center, USA
LTR-Retrotransposon Activity Perturbs Asymmetric Centrosome Inheritance

Pascale Lesage, Institut Universitaire d'Hématologie, France
Molecular Mechanisms and Regulation of Ty1 Retrotransposon Integration Site Selection

Robert A. Martienssen, Cold Spring Harbor Laboratory, USA
The Expanding World of Small RNAs in Plants

Short Talk(s) Chosen from Abstracts

Workshop 2

Short Talks Chosen from Abstracts

LINE1 Dances and Transposon Architecture

John V. Moran, University of Michigan Medical School, USA
A 3' Poly(A) Tract Is Required for LINE-1 Retrotransposition

Gael Cristofari, IRCAN - INSERM/CNRS, France
Genomic Approaches to Study the Activity of Human LINE-1 Elements

Jef D. Boeke, NYU Langone Medical Center, USA
Systems Analyses of L1 Elements and their Friends Suggest S Phase is Critical

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

FRIDAY, FEBRUARY 16

Departure