



Join Keystone Symposia
for the 2016 conference on:

Molecular and Cellular Basis of Growth and Regeneration

January 10–14, 2016

Beaver Run Resort | Breckenridge, Colorado | USA

Scientific Organizers:

Alejandro Sánchez Alvarado, Duoja D.J. Pan and Valentina Greco

The regulation of scale and proportion is a fundamental attribute of life. Yet, the molecular, cellular and systems-level mechanisms regulating these processes remain largely unknown. How is organ size achieved in animals during normal development, and how is it reconstituted in animals capable of regenerating organs and body parts lost to injury? This meeting aims to delineate the molecular and cellular basis of growth and regeneration by highlighting, comparing and contrasting the differences and similarities in scale and proportion mechanisms and stem cell management among diverse animal species. How these biological findings may inform regenerative medicine and stem cell biology and therapeutics will be considered and discussed.

Session Topics:

- Patterning, Growth and Regeneration
- Size Regulation and Signaling Pathways
- Organ and Systemic Regulation of Scale and Proportion
- Epigenetics in Growth and Regeneration
- Genetics of Growth and Regeneration
- Genetics of Morphological Variation
- Physical Forces, Growth and Scale
- Stem Cells, Self-Assembly, Tissue Growth and Regeneration



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 22, 2015

Abstract Deadline: Oct 21, 2015

Discounted Registration Deadline: Nov 10, 2015

For additional details, visit www.keystonesymposia.org/16A3.

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SUNDAY, JANUARY 10

Arrival and Registration

MONDAY, JANUARY 11

Welcome and Keynote Address

***Alejandro Sánchez Alvarado**, Stowers Institute for Medical Research/HHMI, USA

Hopi E. Hoekstra, HHMI/Harvard University, USA
How the Mouse Got Its Stripes

Patterning, Growth and Regeneration

***Tatjana Piotrowski**, Stowers Institute for Medical Research, USA

Norbert Perrimon, Harvard Medical School, USA
Signaling Mechanisms Involved in Drosophila Gut Regeneration

Dunja Knapp, CRTD, Germany
Molecular Mechanisms Integrating Positional Information with Injury Induced Growth during Limb Regeneration

Valentina Greco, Yale School of Medicine, USA
Balancing Tissue Homeostasis with Repair by Two Photon Imaging in Living Mice

Kenneth D. Birnbaum, New York University, USA
Short Talk: Reliving the Past: Regeneration Closely Recapitulates Embryogenesis in the Plant Root

Chloe E. Emerson, Bermuda Institute of Ocean Sciences, Bermuda
Short Talk: Sea Urchins as a Model for Tissue Regeneration: Role of Notch Signaling and Presence of Stem Cell Markers

Size Regulation and Signaling Pathways

***Vicki Pero Losick**, MDI Biological Laboratory, USA

Duoja D.J. Pan, HHMI/Johns Hopkins University School of Medicine, USA

The Hippo Pathway and Organ Size Regulation

Laura A. Johnston, Columbia University, USA
Sensing and Responding to Cell Fitness Differences during Tissue Growth

Tatjana Piotrowski, Stowers Institute for Medical Research, USA
Signaling Interactions that Control Progenitor Number, Maintenance, and Differentiation in Sensory Hair Cell Regeneration

Eric M. Hill, Northwestern University, USA
Short Talk: Wnt/Notum Spatial Feedback Inhibition Controls Neoblast Differentiation to Regulate Reversible Growth of the Planarian Brain

Poster Session 1

TUESDAY, JANUARY 12

Organ and Systemic Regulation of Scale and Proportion

***Eric M. Hill**, Northwestern University, USA

Nadia A. Rosenthal, The Jackson Laboratory, USA
Immune Regulation of Regeneration

Richard Schneider, University of California, San Francisco, USA
Regulation of Jaw Size during Development and Evolution

David D. Moore, Baylor College of Medicine, USA
Making Hepatocytes without Stem Cells

Arkhat Abzhanov, Imperial College London, UK

Evolution of the Animal Face: From Principles to Mechanisms

Joseph T. Rodgers, University of Southern California Keck School of Medicine, USA

Short Talk: Systemic Regulation of Quiescent Stem Cell Function and Regenerative Potential

Vicki Pero Losick, MDI Biological Laboratory, USA
Short Talk: Going BIG for Wound Repair

Epigenetics in Growth and Regeneration

***Jochen C. Rink**, Max Planck Institute of Molecular Cell Biology and Genetics, Germany

Julie C. Baker, Stanford University, USA
Genomics of Tissue Development

Antonio J. Giraldez, Yale University School of Medicine, USA
The Hidden Code Behind the Genetic Code: Codon Optimality Regulates mRNA Translation and Stability during the Maternal to Zygotic Transition

Elena Ezhkova, Icahn School of Medicine at Mount Sinai, USA
Epigenetic Regulation of Skin Stem Cell Control and Differentiation

Charles Sagerström, University of Massachusetts Medical School, USA
Short Talk: Prep/Meis and Pbx Cofactors Poise Promoters for Activation by Hox Proteins

Elizabeth M. Duncan, Stowers Institute for Medical Research, USA
Short Talk: Histone H3 Lysine 4 Methyltransferases Set1 and MLL1/2 Target Distinct Genomic Loci in vivo

Poster Session 2

WEDNESDAY, JANUARY 13

Genetics of Growth and Regeneration

***Elena Ezhkova**, Icahn School of Medicine at Mount Sinai, USA

Bruce A. Edgar, German Cancer Research Center, Germany
Regeneration and Tumorigenesis in the Drosophila Intestinal Epithelium

Mary Baylies, Memorial Sloan Kettering Cancer Center, USA
Regulation of Muscle Cell Size and Organization

Matthew Charles Gibson, Stowers Institute for Medical Research, USA
Coordinating Mitosis and Morphogenesis during Early Embryogenesis of the Sea Anemone, Nematostella vectensis

Kenneth D. Poss, Duke University Medical Center, USA
Regeneration in Zebrafish

Andreas Bergmann, University of Massachusetts Medical School, USA

Short Talk: Extracellular Reactive Oxygen Species Drive Apoptosis-induced Proliferation via Drosophila Macrophages

Pranidhi Sood, University of California, San Francisco, USA
Short Talk: Transcriptional Dynamics of Single-Cell Regeneration in the Ciliate Stentor coeruleus

Genetics of Morphological Variation

***Jayaraj Rajagopal**, Massachusetts General Hospital, USA

Elaine Ostrander, National Human Genome Research Institute, USA
Genomics of Growth in Canines

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David M. Kingsley, Stanford University, USA
Fishing for the Secrets of Evolutionary Change in Vertebrates

Shishir K. Biswas, University of Kentucky, USA
*Short Talk: Comparative RNA-seq between *Acomys cahirinus* (Regenerator) and *Mus musculus* (Non-Regenerator) Reveals Insights into Genetic Control of Mammalian Regeneration*

Poster Session 3

THURSDAY, JANUARY 14

Physical Forces, Growth and Scale

L. Mahadevan, Harvard University, USA
The Physical Bases for Morphogenesis

Marcos Gonzalez-Gaitan, University of Geneva, Switzerland
Biophysics of Tissue Growth and Morphogens

Yohanns Bellaïche, Institut Curie, France
Cell Division and Epithelial Tissue Morphogenesis

Aaron F. Mertz, Rockefeller University, USA
Short Talk: How is a Stratified Epithelium Built Mechanically in vivo?

Mei-I Chung, Duke University, USA
Short Talk: RAGE (Receptor for Advanced Glycation End Products)-Directed Fluorescent Protein Provides a Tool for Studying Alveolar Type I Epithelial Cells

Jochen C. Rink, Max Planck Institute of Molecular Cell Biology and Genetics, Germany
Short Talk: Mechanisms of Growth and Patterning in Planarian Flatworms

Stem Cells, Self-Assembly, Tissue Growth and Regeneration

***Yohanns Bellaïche**, Institut Curie, France

Jayaraj Rajagopal, Massachusetts General Hospital, USA
Stem Cells as Niches for their Own Progeny: New Modes of Stem Cell Regulation

Joachim Wittbrodt, Heidelberg University, Germany
The Memory of Retinal Stem Cells: How to Shape Form and Function

Alejandro Sánchez Alvarado, Stowers Institute for Medical Research/HHMI, USA
Stem Cell Population Dynamics, Tissue Homeostasis and Regeneration

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

FRIDAY, JANUARY 15

Departure