

Keystone Symposia in Lake Tahoe

Cell Competition in Development and Disease

Granlibakken Tahoe | Lake Tahoe, California, USA | February 24–28, 2019

Scientific Organizers:

Margaret A. Goodell, Baylor College of Medicine, USA

Laura A. Johnston, Columbia University, USA

Thomas P. Zwaka, Icahn School of Medicine at Mount Sinai, USA

Cell competition represents a radical departure from the established view that embryonic development is simply a matter of following a preprogrammed set of rules. Instead, it is a highly conserved process that promotes the context-dependent elimination of less fit cells and stimulates growth of more fit cells during growth and homeostasis. Although it has long been known that the basis of competition is the ability of growing cells to monitor fitness of their neighbors, and can be induced via differences in protein production capacity, Myc levels and apico-basal cell polarity, only recently have signaling and effector mechanisms been identified. This conference aims to bring together, for the first time, researchers from diverse fields who study competitive and cooperative interactions between cells. It will cover recent findings on quality control systems, developing tissues, stem cell populations and tumorigenesis, as well as address important evolutionary aspects of competitive and cooperative behavior in diverse model systems. New technologies have uncovered the prevalence of cell competition in humans, with surprising outcomes and implications for human disease. As the first broad conference of this sort, it will define critical questions shared by the diverse investigators and help shape this exciting and emerging field. Given the wide range of developmental and homeostatic systems that are controlled by cell competition, understanding the mechanisms and consequences of competitive interactions may permit the manipulation of these processes for therapeutic purposes.

Session Topics:

- Evolution of Competition and Cooperation
- Stem Cell Competition
- Workshop 1: Technologies for Clonal Tracking
- The Germline
- Mosaicism and Selection in Normal Tissues
- Workshop 2: Oncogenes and Tumor Suppressors as Drivers in Competition
- Cell Selection in Human Disease
- Aging and Pre-Malignancy
- Workshop 3: Modeling Cell Competition
- Competition in Cancer

KEYNOTE SPEAKERS

Kevin Foster

Gines Morata

OTHER PLENARY SPEAKERS

Nicholas E. Baker

Kristin Baldwin

Fernando D. Camargo

Anthony De Tomaso

James DeGregori

Cassandra G. Extavour

David FitzPatrick

Yasuyuki M. Fujita

Margaret A. Goodell

Valentina Greco

Matthew Hurles

Tatsushi Igaki

Laura A. Johnston

Philip H. Jones

Diana J. Laird

Coleman Lindsley

Inigo Martincorena

Erika Matunis

Hiromitsu Nakauchi

Alejandro Sánchez Alvarado

Gad Shaulsky

Harold E. Varmus

Thierry Voet

Irving L. Weissman

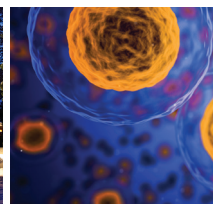
Magdalena D. Zernicka-Goetz

Thomas P. Zwaka

Speaker list current as of Oct 29, 2018

Abstract Deadline (for short talk consideration): Nov 28, 2018; Discounted Registration Deadline: Jan 8, 2019

Visit www.keystonesymposia.org/19B6 | Hashtag: #KScellcomp



KEYSTONE SYMPOSIA™
on Molecular and Cellular Biology
Accelerating Life Science Discovery
a 501(c)(3) nonprofit educational organization

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SUNDAY, FEBRUARY 24

Arrival and Registration

MONDAY, FEBRUARY 25

Cell Competition in Development

Laura A. Johnston, Columbia University, USA
Tissue Ecology: Sensing and Responding to Altered Cell Fitness

Magdalena D. Zernicka-Goetz, University of Cambridge, UK
Cell Selection in Mammalian Embryos

Hiromitsu Nakauchi, Stanford University, USA
Interspecies Chimeras: Competition or Survival

Nicholas E. Baker, Albert Einstein College of Medicine, USA
Ribosomal Control of Cell Competition

Short Talk(s) Chosen from Abstracts

Keynote Address

Kevin Foster, University of Oxford, UK
Evolution of Competition and Cooperation in Microbes

Evolution of Competition and Cooperation

Gad Shaulsky, Baylor College of Medicine, USA
Cooperation and competition in Dictyostelium

Anthony De Tomaso, University of California, Santa Barbara, USA
Inter-Individual Competition in the Colonial Ascidian, Botryllus schlosseri

Short Talk(s) Chosen from Abstracts

Poster Session 1

TUESDAY, FEBRUARY 26

Stem Cell Competition

Thomas P. Zwaka, Icahn School of Medicine at Mount Sinai, USA
Competitive Interactions in the Pluripotent Stem Cell Compartment

Fernando D. Camargo, Boston Children's Hospital, USA
Stem Cell Dynamics and Growth in the Gut

Cassandra Extavour, Harvard University, USA
Talk Title to be Announced

Valentina Greco, Yale School of Medicine, USA
Competitive Behavior during Skin Regeneration

Short Talk(s) Chosen from Abstracts

Workshop 1: Technologies for Clonal Tracking

***Thierry Voet**, KU Leuven, Belgium

***Fernando D. Camargo**, Boston Children's Hospital, USA

Short Talks Chosen from Abstracts

The Germline

Alejandro Sánchez Alvarado, Stowers Institute for Medical Research/HHMI, USA
The Reproductive and Developmental Plasticity of Planarians

Diana J. Laird, University of California, San Francisco, USA
Clonal Dynamics of Primordial Germ Cells

Erika Matunis, Johns Hopkins University School of Medicine, USA
Competing for the Niche in the Fly Testis

Short Talk(s) Chosen from Abstracts

Poster Session 2

WEDNESDAY, FEBRUARY 27

Mosaicism and Selection in Normal Tissues

Kristin Baldwin, The Scripps Research Institute, USA
Variations/Mosaicism within the Brain

Inigo Martincorena, Wellcome Trust Sanger Institute, UK
Somatic Evolution in Healthy Tissues

Philip H. Jones, Wellcome Trust Sanger Institute / University of Cambridge, UK
Clonal Dynamics in the Skin

Irving L. Weissman, Stanford University, USA
Mosaicism in Normal Tissues

Short Talk(s) Chosen from Abstracts

Workshop 2: Oncogenes and Tumor Suppressors as Drivers in Competition

***Philip H. Jones**, Wellcome Trust Sanger Institute / University of Cambridge, UK

***Laura A. Johnston**, Columbia University, USA

Short Talks Chosen from Abstracts

Cell Selection in Human Disease

Margaret A. Goodell, Baylor College of Medicine, USA
Mutations Improving Fitness of the HSC

Thierry Voet, KU Leuven, Belgium
Genome Instability and Fitness in the Developing Human Embryo

David FitzPatrick, University of Edinburgh, UK
Cohesinopathies as a Paradigm for Human Mosaicism

Short Talk(s) Chosen from Abstracts

Poster Session 3

THURSDAY, FEBRUARY 28

Cell Selection in Human Disease II

Matthew Hurles, Wellcome Trust Sanger Institute, UK
Mosaicism and Implications for Human Developmental Disorders

Aging and Pre-Malignancy

James DeGregori, University of Colorado Denver School of Medicine, USA
The Ecology of Cancer: How Changes in Tissue Microenvironments Drive Cancer Evolution as we Age

Coleman Lindsley, Dana-Farber Cancer Institute, USA
Clonal Hematopoiesis as Stem Cell Competition

Tatsushi Igaki, Kyoto University Graduate School of Biostudies, Japan
Mechanism of Tumor-Suppressive Cell Competition

Short Talk(s) Chosen from Abstracts

Workshop 3: Modeling Cell Competition

***Kevin Foster**, University of Oxford, UK

Short Talks Chosen from Abstracts

Closing Keynote Address

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Gines Morata, Universidad Autonoma de Madrid, Spain
*The Two Faces of Cell Competition: Tumor-Suppressing or
Tumor-Stimulating*

Competition in Cancer

Yasuyuki M. Fujita, Hokkaido University, Japan
*Sequential Oncogenic Mutations Profoundly Influence the Outcome of
Cell Competition*

Harold E. Varmus, Weill Cornell Medical College, USA
*Turning Clues from Cancer Genomics into Mechanisms of Cancer
Development and Evolution*

Short Talk Chosen from Abstracts

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

FRIDAY, MARCH 1

Departure