



Regulation of Tissue Homeostasis by Signaling in the Stem Cell Niche

August 7 - 12, 2016

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Conference Description

Adult epithelia regenerate during adult life due to the constant activity of stem cell pools. Stem cells maintain tissue homeostasis and repair injury by close communication with their tissue environment, known as "niche". Niches are complex, structured arrays of different cell types that guide tissue stem cell dynamics. The ultimate goal of understanding epithelial stem cell regulation is to repair or replace cells or organs damaged by injury, disease, and aging. The strategies vary from generating cell types and tissues in a dish for transplantation purposes, to directly stimulating the damaged organ in the living organism. This field has been exponentially growing for the past decade. Tissues such as human skin and cornea have already been grown in 3D cultured and used in clinics to fight otherwise incurable medical conditions. The GRC "Tissue Niches and Resident Stem Cells in Adult Epithelia" will focus on comparative principles of adult epithelial stem cell dynamics and niche signaling in the homeostasis of different tissues. This conference will include work on the molecular control of stem cell function from the epidermis and its appendages, intestine, lung, mammary gland, cornea and retina, epithelial transition zones, and emerging work from other epithelial tissues. All model organisms are welcome. We strongly believe in being inclusive, and hope to inspire a principle of alternating

speakers that will allow a variety of participants to contribute to this exciting meeting over the coming years.

Conference Program

Sunday

2:00 pm - 8:00 pm	Arrival and Check-in
6:00 pm	Dinner
7:30 pm - 7:40 pm	Welcome / Introductory Comments by GRC Site Staff
7:40 pm - 9:30 pm	Keynote Session: Signaling Unity Within Epithelial Stem Cell Diversity Discussion Leader: Rongwen Xi (National Institute of Biological Sciences, China)
7:40 pm - 7:50 pm	Opening Remarks
7:50 pm - 7:55 pm	Introduction by Discussion Leader
7:55 pm - 8:35 pm	Roeland Nusse (Stanford University, USA) "Stem Cells in Liver Homeostasis"
8:35 pm - 8:45 pm	Discussion
8:45 pm - 9:25 pm	Fiona Watt (King's College London, United Kingdom) " <i>In Vitro</i> Approaches to Analyze the Epidermal Stem Cell Niche"
9:25 pm - 9:30 pm	Discussion

Monday

7:30 am - 8:30 am	Breakfast
9:00 am - 12:30 pm	Epithelial Stem Cells and Their Skin Niches Discussion Leaders: Fiona Watt (King's College London, United Kingdom) and Xiaoyang Wu (University of Chicago, USA)
9:00 am - 9:05 am	Introduction by Discussion Leader

9:05 am - 9:25 am	Howard Chang (Stanford University, USA) "RNA World and Regulation of Gene Expression"
9:25 am - 9:35 am	Discussion
9:35 am - 9:55 am	Pritinder Kaur (Curtin University, Australia) "MSC-Like Dermal Pericytes Influence Epidermal Renewal by Promoting Symmetric Keratinocyte Cell Divisions"
9:55 am - 10:00 am	Discussion
10:00 am - 10:30 am	Group Photo / Coffee Break
10:30 am - 10:50 am	Valerie Horsley (Yale University, USA) "Adipocytes as Niche Cells in Epithelial Tissues"
10:50 am - 11:00 am	Discussion
11:00 am - 11:20 am	Xing Dai (University of California, Irvine, USA) "Keeping Skin and Mammary Epithelial Stem/Progenitor Cells Epithelial"
11:20 am - 11:30 am	Discussion
11:30 am - 11:50 am	Vladimir Botchkarev (Boston University, USA / University of Bradford, United Kingdom) "Epigenetic Regulation of Epidermal Development and Differentiation"
11:50 am - 12:00 pm	Discussion
12:00 pm - 12:10 pm	Aiko Sada (Tsukuba Advanced Research Alliance, University of Tsukuba, Japan) "Stem Cell Lineages of the Interfollicular Epidermis"
12:10 pm - 12:15 pm	Discussion
12:15 pm - 12:25 pm	Sangbum Park (Yale University, USA) "Coordination of Tissue Homeostasis and Wound Repair Mechanisms in Live Mice"
12:25 pm - 12:30 pm	Discussion

12:30 pm	Lunch
1:30 pm - 4:00 pm	Free Time
3:00 pm - 4:00 pm	<u>Power Hour</u>
	<i>The GRC Power Hour is an optional informal gathering open to all meeting participants. It is designed to help address the challenges women face in science and support the professional growth of women in our communities by providing an open forum for discussion and mentoring.</i>
	Organizers: Fiona Watt (King's College London, United Kingdom) and Jane Visvader (The Walter and Eliza Hall Institute of Medical Research, Australia)
4:00 pm - 6:00 pm	<u>Poster Session</u>
6:00 pm	Dinner
7:30 pm - 9:30 pm	Epithelial Stem Cells in Translation
	Discussion Leaders: Michele De Luca (University of Modena and Reggio Emilia, Italy) and Andrea Flesken-Nikitin (Cornell University, USA)
7:30 pm - 7:55 pm	Michele De Luca (University of Modena and Reggio Emilia, Italy) "Epidermal Stem-Mediated Combined Cell and Gene Therapy for the Treatment of Epidermolysis Bullosa"
7:55 pm - 8:05 pm	Discussion
8:05 pm - 8:25 pm	Graziella Pellegrini (University of Modena and Reggio Emilia, Italy) "Regenerative Medicine by Corneal Stem Cells: <i>In Vitro</i> and <i>In Vivo</i> Niches"
8:25 pm - 8:30 pm	Discussion
8:30 pm - 8:50 pm	Nadia Zakaria (Universitaire Ziekenhuis Antwerpen, Belgium) "Collagen Analogs as Scaffolds for Corneal Regeneration"
8:50 pm - 9:00 pm	Discussion

9:00 pm - 9:10 pm	Catherine Lu (The Rockefeller University, USA) "Identification of Adult Stem Cells in Eccrine Sweat Glands: Wound Repair and Regeneration"
9:10 pm - 9:15 pm	Discussion
9:15 pm - 9:25 pm	Clare Weeden (The Walter and Eliza Hall Institute of Medical Research, Australia) "Airway Basal Stem Cells Use Error-Prone DNA Repair in Response to DNA Damaging Agents"
9:25 pm - 9:30 pm	Discussion
Tuesday	
7:30 am - 8:30 am	Breakfast
9:00 am - 12:30 pm	Hair Follicle Stem Cells Discussion Leaders: George Cotsarelis (University of Pennsylvania, USA) and Xinhong Lim (Institute of Medical Biology, A*STAR, Singapore)
9:00 am - 9:25 am	George Cotsarelis (University of Pennsylvania, USA) "Bulge Stem Cells in Mouse and Human Hair Follicles"
9:25 am - 9:35 am	Discussion
9:35 am - 9:55 am	Sung-Jan Lin (National Taiwan University, Taiwan) "Environmental Regulation of Hair Follicle Neogenesis and Regeneration"
9:55 am - 10:00 am	Discussion
10:00 am - 10:30 am	Coffee Break
10:30 am - 10:50 am	Tudorita Doina Tumbar (Cornell University, USA) "Genetic and Epigenetic Control of Stem Cell Dynamics in and out the Niche"
10:50 am - 11:00 am	Discussion

11:00 am - 11:20 am	Ting Chen (National Institute of Biological Sciences, China) "How to Build a Functional Niche with Stem Cells"
11:20 am - 11:30 am	Discussion
11:30 am - 11:50 am	Michael Rendl (Icahn School of Medicine at Mount Sinai, USA) "Regulation of Hair Follicle Formation, Growth and Regeneration by the Mesenchymal Niche"
11:50 am - 12:00 pm	Discussion
12:00 pm - 12:10 pm	Isaac Brownell (National Cancer Institute, NIH, USA) "The Perineural Niche as a Regulator of Cutaneous Stem Cells"
12:10 pm - 12:15 pm	Discussion
12:15 pm - 12:25 pm	Kenneth Lay (The Rockefeller University, USA) "Foxc1 Governs Hair Follicle Stem Cell Quiescence and Niche Maintenance to Preserve Long-Term Tissue-Regenerating Potential"
12:25 pm - 12:30 pm	Discussion
12:30 pm	Lunch
2:00 pm - 4:00 pm	<u>Poster Session</u>
4:00 pm - 6:00 pm	Lung Stem Cells Discussion Leaders: Brigid Hogan (Duke University, USA) and Nan Tang (National Institute of Biological Sciences, Beijing, China)
4:00 pm - 4:25 pm	Brigid Hogan (Duke University, USA) "Lung Stem/Progenitor Cells and Their Niche During Homeostasis and Repair"
4:25 pm - 4:35 pm	Discussion
4:35 pm - 4:55 pm	Barry Stripp (Cedars Sinai Medical Center, USA) "Progenitor Cell Fate in Airway Repair"
4:55 pm - 5:05 pm	Discussion

5:05 pm - 5:25 pm	Joo-Hyeon Lee (University of Cambridge, United Kingdom) "Regulatory Crosstalk in Lineage Specification of Epithelial Cells During Lung Repair and Regeneration"
5:25 pm - 5:30 pm	Discussion
5:30 pm - 5:40 pm	Ian Driver (University of California, San Francisco, USA) "Single Cell Profiling of Adult Lung Heterogeneity: Identification of Novel Cell Types Involved in Regeneration and Disease"
5:40 pm - 5:45 pm	Discussion
5:45 pm - 5:55 pm	Rui Zhao (Genomics Institute of the Novartis Research Foundation, USA) "Tissue Logic in the Airway Epithelium: Plasticity and Regulation"
5:55 pm - 6:00 pm	Discussion
6:00 pm	Dinner
Wednesday	
7:30 am - 8:30 am	Breakfast
9:00 am - 12:30 pm	Intestinal Stem Cells Discussion Leaders: Bruce Edgar (Huntsman Cancer Institute, University of Utah Health Care, USA) and Zhengquan Yu (China Agricultural University, China)
9:00 am - 9:25 am	Bruce Edgar (Huntsman Cancer Institute, University of Utah Health Care, USA) "Regenerative and Tumorigenic Growth of <i>Drosophila</i> Intestinal Stem Cells"
9:25 am - 9:35 am	Discussion
9:35 am - 9:55 am	Tony Ip (University of Massachusetts Medical School, USA) "The Conserved Misshapen-Yorkie Pathway in <i>Drosophila</i> Intestinal Homeostasis"
9:55 am - 10:05 am	Discussion

10:05 am - 10:35 am	Coffee Break
10:35 am - 10:55 am	Heinrich Jasper (Buck Institute for Research on Aging, USA) "Age-Related Stem Cell Dysfunction: Lessons from <i>Drosophila</i> "
10:55 am - 11:05 am	Discussion
11:05 am - 11:25 am	Rongwen Xi (National Institute of Biological Sciences, China) "Fate Specification and Maintenance in the Midgut Stem Cell Lineages"
11:25 am - 11:35 am	Discussion
11:35 am - 11:55 am	Nozomi Nishimura (Cornell University, USA) " <i>In Vivo</i> Imaging of Stem Cells in the Mouse Intestine and Beyond"
11:55 am - 12:05 pm	Discussion
12:05 pm - 12:25 pm	Lucy O'Brien (Stanford University, USA) "Motile Stem Cells Exhibit Tissue-Level Spatial Order During Steady-State Organ Renewal but Not Adaptive Organ Growth"
12:25 pm - 12:30 pm	Discussion
12:30 pm	Lunch
1:30 pm - 4:00 pm	Free Time
4:00 pm - 6:00 pm	<u>Poster Session</u>
6:00 pm	Dinner
7:00 pm - 7:30 pm	<u>Business Meeting</u>
	<i>Nominations for the Next Vice Chair; Fill in Conference Evaluation Forms; Discuss Future Site and Scheduling Preferences; Election of the Next Vice Chair</i>
7:30 pm - 9:30 pm	Epithelial Stem Cells of Oral and Craniofacial Complex Discussion Leaders: Ophir Klein (University of California, San Francisco, USA) and Tsung-Lin Yang (National Taiwan University, Taiwan)

- 7:30 pm - 7:50 pm **Ophir Klein** (University of California, San Francisco, USA)
"Dynamics of Oral and Dental Epithelial Stem Cells During Homeostasis and Regeneration"
- 7:50 pm - 8:00 pm Discussion
- 8:00 pm - 8:20 pm **Catherine Ovitt** (University of Rochester, USA)
"Finding a Role for Stem Cells in Salivary Gland Homeostasis"
- 8:20 pm - 8:30 pm Discussion
- 8:30 pm - 8:50 pm **Yang Chai** (University of Southern California, USA)
"Molecular Regulation of the Dental Epithelial Stem Cell Niche"
- 8:50 pm - 9:00 pm Discussion
- 9:00 pm - 9:10 pm **Maria Alcolea** (Wellcome Trust/MRC Cambridge Stem Cell Institute, United Kingdom)
"Cell Fate Imbalance in the Oesophageal Epithelium: Mutant Cell Competition"
- 9:10 pm - 9:15 pm Discussion
- 9:15 pm - 9:25 pm **Sarah Knox** (University of California, San Francisco, USA)
"Peripheral Nerves Selectively Establish, Maintain and Replenish Salivary Gland Architecture via SOX2"
- 9:25 pm - 9:30 pm Discussion

Thursday









- 7:30 am - 8:30 am Breakfast
- 9:00 am - 12:30 pm **Mammary, Prostate, and Ovarian Stem Cells**
Discussion Leaders: **Michael Shen** (Columbia University Medical Center, USA) and **Chang Liu** (Columbia University, USA)
- 9:00 am - 9:30 am **Michael Shen** (Columbia University Medical Center, USA)
"Progenitor Cells and the Origin of Prostate Cancer"
- 9:30 am - 9:40 am Discussion

9:40 am - 10:05 am	Li Xin (Baylor College of Medicine, USA) "Prostate Epithelial Lineage Hierarchy"
10:05 am - 10:15 am	Discussion
10:15 am - 10:45 am	Coffee Break
10:45 am - 11:10 am	Arial Zeng (Chinese Academy of Sciences, China) "Procr Stem Cells in Mammary Development and Cancer"
11:10 am - 11:20 am	Discussion
11:20 am - 11:40 am	Jane Visvader (The Walter and Eliza Hall Institute of Medical Research, Australia) "Mapping Stem and Progenitor Cells During Development and Tumorigenesis"
11:40 am - 11:50 am	Discussion
11:50 am - 12:05 pm	Qiang Lan (Institute of Biotechnology, University of Helsinki, Finland) "Cellular Behavior of Mammary Progenitor Cells During Embryonic Mammary Gland Development"
12:05 pm - 12:15 pm	Discussion
12:15 pm - 12:25 pm	Winnie Shum (ShanghaiTech University, China) "Epithelial Cellular Communication for a Congenial Niche in Excurrent Duct"
12:25 pm - 12:30 pm	Discussion
12:30 pm	Lunch
1:30 pm - 4:00 pm	Free Time
4:00 pm - 6:00 pm	Stem Cells of Transitional Zones Discussion Leaders: Alexander Nikitin (Cornell University, USA) and Guy Lyons (Centenary Institute, Australia)
4:00 pm - 4:25 pm	Alexander Nikitin (Cornell University, USA) "Transitional Zones, Stem Cells and Cancer"

4:25 pm - 4:30 pm	Discussion
4:30 pm - 4:50 pm	Geraldine Guasch (Institut Paoli Calmettes, Cancer Research Center of Marseille, France) "Transitional Epithelium: Merging Microenvironment and Cellular Transformation"
4:50 pm - 4:55 pm	Discussion
4:55 pm - 5:15 pm	Yusuke Yamamoto (National Cancer Center Research Institute, Japan) "Enemies from Within: Stem Cells of Metaplastic Precursors of Highly Lethal Cancers"
5:15 pm - 5:20 pm	Discussion
5:20 pm - 5:30 pm	Joana Neves (Buck Institute for Research on Aging, USA) "Immune Modulation by MANF Promotes Tissue Repair and Regenerative Success in the Retina"
5:30 pm - 5:35 pm	Discussion
5:35 pm - 5:45 pm	Jeff Mumm (Johns Hopkins School of Medicine, USA) "Innate Immune System Regulation of Retinal Regeneration"
5:45 pm - 5:50 pm	Discussion
5:50 pm - 6:00 pm	Closing Remarks
6:00 pm	Dinner
Friday	
7:30 am - 8:30 am	Breakfast
9:00 am	Departure

Contributors



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