

Directed Cell Migration

Gordon Research Conference

Mechanisms of Collective and Single Cell Motility in Development, Homeostasis and Disease

Dates

January 22-27, 2017

Location

Hotel Galvez
Galveston, TX

Organizers

Chair:

Denise Montell

Vice Chair:

Orion D. Weiner

Application Deadline

Applications are no longer being accepted for this meeting. If you have been instructed to apply by the Conference Chair, please contact **Megan Totten** for further instructions.

Meeting Description

Directed cell migration is a spectacular feature of normal development and tissue homeostasis. Without cell migration, embryos would not develop, wounds would never heal, and the immune system could neither form nor function. However cancer cells hijack these beneficial cell motility mechanisms to spread through the body. The objective of the 2017 Directed Cell Migration Gordon Conference is to bring together an international group of young and senior scientists who share a common interest in cell migration to exchange their cutting edge approaches and breakthrough discoveries. This conference will provide an opportunity to develop interactions and collaborations among scientists from multiple disciplines that are related to directed cell migration, including participants from the fields of immunology and inflammation, cancer invasion and metastasis, embryological development and tissue repair, as well as related fields, including engineering, physics and computational biology. This high level of scientific interaction will encourage the attendees to learn about latest research findings, develop novel hypotheses, and enhance insight into how cell migration contributes to disease. The session speakers, selected from a variety of fields, will emphasize novel, unpublished results directly related to gradient sensing and directed cell migration. Young investigators will be encouraged to present and discuss their findings in a supportive environment through the invitation of up to 20 additional speakers, selected from submitted abstracts, by participation in the posters sessions and through the associated Gordon Research Seminar. Throughout the conference and seminar, interactions between senior and young investigators will be promoted in both formal and informal settings.

Related Meeting



This GRC will be held in conjunction with the "Directed Cell Migration" Gordon Research Seminar (GRS). Those interested in attending both meetings must submit an application for the GRS in addition to an application for the GRC. Refer to the [associated GRS program page](#) for more information.

Contributors



Meeting Program

Sunday

- 4:00 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: 25 Years of Rac and Rho**
- Session in honor of Alan Hall.*
- Discussion Leader: **Tatiana Omelchenko** (Memorial Sloan Kettering Cancer Center, USA)
- 7:40 pm - 7:50 pm Opening Remarks
- 7:50 pm - 8:30 pm **Anne Ridley** (King's College London, United Kingdom)
"Migration Across the Endothelial Barrier"
- 8:30 pm - 8:40 pm Discussion
- 8:40 pm - 9:20 pm **Sandrine Etienne-Manneville** (Institut Pasteur, France)
"Role of Intermediate Filaments in Directed Collective Migration"
- 9:20 pm - 9:30 pm Discussion

Monday

- 7:30 am - 8:30 am Breakfast
- 8:30 am Group Photo
- 9:00 am - 12:30 pm **Directed Cell Migration in Development**
- Discussion Leader: **Andrew Ewald** (Johns Hopkins University School of Medicine, USA)
- 9:00 am - 9:25 am **Roberto Mayor** (University College London, United Kingdom)
"Collective Cell Migration During Development: The Case of the Neural Crest"
- 9:25 am - 9:35 am Discussion

- 9:35 am - 10:00 am **Sally Horne-Badovinac** (University of Chicago, USA)
"Fat2 and Lar Promote Epithelial Migration by Coordinating Leading Edge Trailing Edge Dynamics Between Neighboring Cells"
- 10:00 am - 10:10 am Discussion
- 10:10 am - 10:20 am **Tatiana Omelchenko** (Memorial Sloan Kettering Cancer Center, USA)
"The Small Rho GTPase GEF Beta-Pix Regulates Collective Mesoderm Migration *In Vivo*"
- 10:20 am - 10:25 am Discussion
- 10:25 am - 10:35 am **Daria Siekhaus** (Institute of Science and Technology Austria, Austria)
"*Drosophila* TNF, Eiger, Regulates Tissue Tension Through the Crumbs Complex to Facilitate Macrophage Invasive Migration During Embryogenesis"
- 10:35 am - 10:40 am Discussion
- 10:40 am - 11:10 am Coffee Break
- 11:10 am - 11:35 am **Brian Stramer** (King's College London, United Kingdom)
"Contact Inhibition Drives the Even Distribution of ECM During *Drosophila* Development"
- 11:35 am - 11:45 am Discussion
- 11:45 am - 12:05 pm **Eduardo Moreno** (Champalimaud Foundation, Portugal)
"Oncogene Induced Cell Intercalation and Tissue Destruction"
- 12:05 pm - 12:15 pm Discussion
- 12:15 pm - 12:30 pm Poster Previews
- 12:30 pm Lunch
- 1:30 pm - 4:00 pm Free Time
- 4:00 pm - 6:00 pm Poster Session
- 6:00 pm Dinner
- 7:30 pm - 9:30 pm **Chemotaxis Signaling**
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- Discussion Leader: **Milka Sarris** (University of Cambridge, United Kingdom)
- 7:30 pm - 7:55 pm **Carole Parent** (National Cancer Institute, NIH, USA)
"Exosomes as Key Regulators of Signal Relay During Chemotaxis"
- 7:55 pm - 8:05 pm Discussion
- 8:05 pm - 8:30 pm **Robert Insall** (Cancer Research UK Beatson Institute, University of Glasgow, United Kingdom)
"Self-Generated Gradients - Chemotaxis Works Differently when Cells Make Their Own Directions"
- 8:30 pm - 8:40 pm Discussion
- 8:40 pm - 9:05 pm **Peter Devreotes** (Johns Hopkins University School of Medicine, USA)
"Excitable Networks in Directed Cell Migration"
- 9:05 pm - 9:15 pm Discussion
- 9:15 pm - 9:25 pm **Peter Van Haastert** (University of Groningen, The Netherlands)
"New Signaling Networks for Symmetry Breaking and Directed Cell Movement"
- 9:25 pm - 9:30 pm Discussion

Tuesday

- 7:30 am - 8:30 am Breakfast
- 9:00 am - 12:30 pm **Directed Cell Migration in Wound Repair**
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Discussion Leader: **Ronald Germain** (National Institute of Allergy and Infectious Diseases, NIH, USA)

- 9:00 am - 9:25 am **Anna Huttenlocher** (University of Wisconsin-Madison, USA)
"Chemokine Signaling in Bidirectional Migration"
- 9:25 am - 9:35 am Discussion
- 9:35 am - 9:45 am **William Holmes** (Vanderbilt University, USA)
"Crosstalk Between Rac and Rho GTPases Promote Morphological Heterogeneity Among Motile Cells"
- 9:45 am - 9:50 am Discussion
- 9:50 am - 10:15 am **Tobias Meyer** (Stanford University, USA)
"Engulfed Cadherin Fingers Guide Endothelial Cells During Collective Migration"
- 10:15 am - 10:25 am Discussion
- 10:25 am - 10:35 am **Abhijit Deb Roy** (University of Connecticut Health Center, USA)
"An Optogenetic Approach to Elucidate Contact Inhibition of Locomotion Between Osteoclasts and Osteoblasts"
- 10:35 am - 10:40 am Discussion
- 10:40 am - 11:10 am Coffee Break
- 11:10 am - 11:35 am **Will Wood** (University of Bristol, United Kingdom)
"Detecting Death and Damage: Macrophage Migration in *Drosophila*"
- 11:35 am - 11:45 am Discussion
- 11:45 am - 11:55 am **Varuzhan Balasanyan** (University of California, Santa Barbara, USA)
"Cells Recovering from the Brink of Apoptotic Cell Death Acquire Migration Capacity Through TGF β Signaling and Snail"
- 11:55 am - 12:00 pm Discussion
- 12:00 pm - 12:10 pm **Sylvain Gabriele** (University of Mons, Belgium)
"The Mechanosensitivity of Motile Keratocytes Depends on α 5 β 1 Integrin Engagement"
- 12:10 pm - 12:15 pm Discussion
- 12:15 pm - 12:30 pm Poster Previews
- 12:30 pm Lunch
- 1:30 pm - 4:00 pm Free Time
- 4:00 pm - 6:00 pm Poster Session
- 6:00 pm Dinner
- 7:30 pm - 9:30 pm **Cell Migration in Cancer**
- Discussion Leader: **Celeste Nelson** (Princeton University, USA)
- 7:30 pm - 7:55 pm **Andrew Ewald** (Johns Hopkins University School of Medicine, USA)
"Collective Cell Migrations Driving Mammary Morphogenesis and Breast Cancer Metastasis"
- 7:55 pm - 8:05 pm Discussion
- 8:05 pm - 8:30 pm **Erik Sahai** (The Francis Crick Institute, United Kingdom)
"Cancer Cell Invasion in Complex Environments"
- 8:30 pm - 8:40 pm Discussion
- 8:40 pm - 8:50 pm **Meghan Driscoll** (University of Texas Southwestern Medical Center, USA)
"Identifying Stereotypical Cellular Morphological Structures from High-Resolution 3D Images of Living Cells"
- 8:50 pm - 8:55 pm Discussion

8:55 pm - 9:20 pm **Cynthia Reinhart-King** (Vanderbilt University, USA)
"Mechanical and Structural Matrix Cues Direct Metastatic Cell Migration"

9:20 pm - 9:30 pm Discussion

Wednesday

7:30 am - 8:30 am Breakfast

9:00 am - 12:30 pm **Immune Cell Migration**

Discussion Leader: **Anna Huttenlocher** (University of Wisconsin-Madison, USA)

9:00 am - 9:25 am **Ronald Germain** (National Institute of Allergy and Infectious Diseases, NIH, USA)
"Imaging the Immune System – Insights into Control of Cell Directionality and Migration"

9:25 am - 9:35 am Discussion

9:35 am - 10:00 am **Milka Sarris** (University of Cambridge, United Kingdom)
"Gradient Sensing in Interstitial Leukocyte Migration"

10:00 am - 10:10 am Discussion

10:10 am - 10:20 am **Judy Cannon** (University of New Mexico School of Medicine, USA)
"Environmental Influences on T Cell Motion in Intact Tissues"

10:20 am - 10:25 am Discussion

10:25 am - 10:35 am **Daniel Irimia** (Harvard Medical School, USA)
"Multiple Chemoattractants and One Stop Signal Mediate Human Neutrophil Swarming"

10:35 am - 10:40 am Discussion

10:40 am - 11:10 am Coffee Break

11:10 am - 11:35 am **Orion Weiner** (UCSF School of Medicine, USA)
"Signal Integration During Neutrophil Chemotaxis"

11:35 am - 11:45 am Discussion

11:45 am - 11:55 am **Tian Jin** (National Institute of Allergy and Infectious Diseases, NIH, USA)
"Phagocytes of Dictyostelium and Neutrophils Use Chemoattractant GPCRs to Mediate both Chemotaxis and Phagocytosis for Catching and Ingesting Bacteria"

11:55 am - 12:00 pm Discussion

12:00 pm - 12:10 pm **Takanari Inoue** (Johns Hopkins University, USA)
"Membrane Curvature Dictates Local PI3K Signaling"

12:10 pm - 12:15 pm Discussion

12:15 pm - 12:30 pm Poster Previews

12:30 pm Lunch

1:30 pm - 4:00 pm Free Time

4:00 pm - 6:00 pm Poster Session

6:00 pm Dinner

7:00 pm - 7:30 pm Business Meeting

Nominations for the Next Vice Chair; Fill in Conference Evaluation Forms; Discuss Future Site and Scheduling Preferences; Election of the Next Vice Chair

7:30 pm - 9:30 pm **Mechanics of Cell Migration**

Discussion Leader: **Tobias Meyer** (Stanford University, USA)

7:30 pm - 7:55 pm **Nir Gov** (Weizmann Institute of Science, Israel)

"Theoretical Models for Single and Collective Cell Motility"

7:55 pm - 8:05 pm Discussion

8:05 pm - 8:30 pm **Clare Waterman** (National Institutes of Health, USA)

"FMN2 Is a Melanoma Metastasis-Promoter that Mediates Formation of a Perinuclear Actin/Adhesion System to Protect Nuclei and DNA from Damage During Confined Cell Migration"

8:30 pm - 8:40 pm Discussion

8:40 pm - 9:05 pm **Celeste Nelson** (Princeton University, USA)

"Forces of Collective Migration During Morphogenesis"

9:05 pm - 9:15 pm Discussion

9:15 pm - 9:25 pm **Robert Kay** (MRC Laboratory of Molecular Biology, United Kingdom)"The Piezo Channel Transduces Mechanical Information to Control How *Dictyostelium* Cells Move"

9:25 pm - 9:30 pm Discussion

Thursday

7:30 am - 8:30 am Breakfast

9:00 am - 12:30 pm **Migration and Metastasis**Discussion Leader: **Erik Sahai** (The Francis Crick Institute, United Kingdom)9:00 am - 9:25 am **Peter Friedl** (Radboud University Medical Center, The Netherlands)

"Plasticity of Cell Migration: Integrins and the Microenvironment"

9:25 am - 9:35 am Discussion

9:35 am - 10:00 am **Raghu Kalluri** (University of Texas MD Anderson Cancer Center, USA)

"The Biology and Function of EMT in Pancreatic Cancer"

10:00 am - 10:10 am Discussion

10:10 am - 10:20 am **Minna Roh** (Fred Hutchinson Cancer Research Center, USA)"Macrophage-Dependent Cytoplasmic Transfer Drives Melanoma Metastasis *In Vivo*"

10:20 am - 10:25 am Discussion

10:25 am - 10:55 am Coffee Break

10:55 am - 11:20 am **Adam Marcus** (Emory University School of Medicine, USA)

"Image-Guided Genomics Reveals Cellular Symbiosis During Cancer Invasion"

11:20 am - 11:30 am Discussion

11:30 am - 11:40 am **Fanny Jaulin** (Institut Gustave Roussy, France)

"Collective Epithelial-Based Metastases in Colorectal Carcinoma Patients"

11:40 am - 11:45 am Discussion

11:45 am - 11:55 am **Jennifer Mitchel** (Harvard T.H. Chan School of Public Health, USA)

"The Unjamming Transition Is Distinct from the Epithelial-to-Mesenchymal Transition"

11:55 am - 12:00 pm Discussion

12:00 pm - 12:10 pm **Jamie Nosbisch** (North Carolina State University, USA)

"A Reaction-Diffusion Model Explains Amplification of the Phospholipase C/Protein Kinase C Pathway in Fibroblast Chemotaxis"

12:10 pm - 12:15 pm Discussion

12:15 pm - 12:30 pm Poster Previews

12:30 pm Lunch

1:30 pm - 4:00 pm Free Time

4:00 pm - 6:00 pm Poster Session

6:00 pm Dinner

7:30 pm - 9:30 pm **Cytoskeleton Dynamics in Migrating Cells**

Discussion Leader: **Sandrine Etienne-Manneville** (Institut Pasteur, France)

7:30 pm - 7:55 pm **James Bear** (University of North Carolina School of Medicine, USA)
"GPCR vs. RTK Chemotaxis in Fibroblasts: Putting Old Players to Work in New Ways"

7:55 pm - 8:05 pm Discussion

8:05 pm - 8:15 pm **Jordan Beach** (National Heart, Lung, and Blood Institute, NIH, USA)
"Actin Dynamics and Competition for Myosin Monomer Govern the Sequential Amplification of Myosin Filaments"

8:15 pm - 8:20 pm Discussion

8:20 pm - 8:45 pm **Margaret Gardel** (The University of Chicago, USA)
"Spatial Regulation of RhoA Reveals Zyxin-Mediated Elasticity of Stress Fibers"

8:45 pm - 8:55 pm Discussion

8:55 pm - 9:20 pm **Michael Sixt** (Institute of Science and Technology Austria, Austria)
"Topography-Based Force Transduction"

9:20 pm - 9:30 pm Discussion

Friday

7:30 am - 8:30 am Breakfast

9:00 am Departure