



Glial Biology: Functional Interactions Among Glia and Neurons

Gordon Research Conference

Neuron-Glia Interactions in Health and Disease

March 5 - 10, 2017

Chair

Beth A. Stevens

Vice Chair

Dwight E. Bergles

Four Points Sheraton / Holiday Inn Express

1050 Schooner Drive

Ventura, CA, US

Conference Description

The goal of this meeting is to provide an active forum for exchange of results in the rapidly advancing fields of glial biology and neuron-glia interactions. Far more active than once thought, glial cells are critical participants in every major aspect of brain development, function, and disease. The biology of astrocytes, microglia, and other glial cells in physiology and pathology will be emphasized. Leaders in the field will present cutting edge research and discuss critical gaps in our knowledge. The spirit of this conference will be constructive, collaborative and forward-looking, with an emphasis on emerging research, tools and technologies. In conjunction with the affiliated Gordon Research Seminar (GRS), trainees will have many opportunities to present their work, network, and share new ideas. The topics addressed in this meeting have direct relevance for human health, as they seek to clarify key mechanisms underlying nervous system injury and disease.

The program is divided into nine sessions covering the role of glia in brain development, plasticity, and homeostasis; modulation of synaptic function and dysfunction; metabolic control and neurovascular coupling; contribution to disease and repair; and emerging technologies for defining glial function. Poster sessions will permit all participants to contribute to these topics.

Related Meeting



This GRC will be held in conjunction with the "Glial Biology: Functional Interactions Among Glia and Neurons (GRS)" 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.

Conference Program

Sunday	
4:00 pm - 8:00 pm	Arrival and Check-in
6:00 pm - 7:00 pm	Dinner
7:30 pm - 7:40 pm	Introductory Comments by GRC Site Staff / Welcome from the GRC Chair
7:40 pm - 9:30 pm	Contribution of Glia to Brain Wiring Discussion Leader: Richard Ransohoff (Biogen, USA)
7:40 pm - 8:00 pm	David Lyons (University of Edinburgh, United Kingdom) "How Does Neuronal Activity Regulate CNS Myelination?"
8:00 pm - 8:10 pm	Discussion
8:10 pm - 8:30 pm	Staci Bilbo (Harvard Medical School, USA) "Sex Differences in Microglial Maturation in Mice and in Human Disease"
8:30 pm - 8:40 pm	Discussion
8:40 pm - 9:00 pm	Etienne Audinat (Paris Descartes University, France) "Microglial Cells Control the Functional Maturation of Synapses in the Developing Somatosensory Cortex "
9:00 pm - 9:10 pm	Discussion
9:10 pm - 9:25 pm	Dorothy Schafer (University of Massachusetts Medical School, USA) "Microglia: Dynamic Regulators of Brain Plasticity"
9:25 pm - 9:30 pm	Discussion
Monday	



7:30 am - 8:30 am	Breakfast
8:30 am - 9:00 am	Group Photo
9:00 am - 12:30 pm	<p>Glial Contributions to Synaptic Plasticity and Neuromodulation</p> <p>Discussion Leader: Erik Ullian (University of California, San Francisco, USA)</p>
9:00 am - 9:20 am	<p>Stephane Oliet (Neurocentre Magendie, INSERM U1215, France)</p> <p>"IP3Rs in Astrocytes: Contribution to Ca²⁺ Signaling and Hippocampal Plasticity"</p>
9:20 am - 9:30 am	Discussion
9:30 am - 9:50 am	<p>Sergey Kasparov (University of Bristol, United Kingdom)</p> <p>"Glio-Protection and Neuroprotection via an Orphan G-Protein-Mediated Signalling Pathway"</p>
9:50 am - 10:00 am	Discussion
10:00 am - 10:20 am	<p>Anna Molofsky (University of California, San Francisco, USA)</p> <p>"Astrocyte-Microglia Crosstalk in Developmental Synapse Remodeling"</p>
10:20 am - 10:30 am	Discussion
10:30 am - 11:00 am	Coffee Break
11:00 am - 11:20 am	<p>Jaideep Bains (University of Calgary, Canada)</p> <p>"Stress-Induced Structural and Functional Plasticity in Astrocytes"</p>
11:20 am - 11:30 am	Discussion
11:30 am - 11:50 am	<p>Nicola Allen (Salk Institute for Biological Studies, USA)</p> <p>"Astrocyte Regulation of Neuronal Glutamate Receptors"</p>
11:50 am - 12:00 pm	Discussion
12:00 pm - 12:20 pm	<p>Brian MacVicar (University of British Columbia, Canada)</p> <p>"Metabolic Regulation of Microglia Immunosurveillance"</p>
12:20 pm - 12:30 pm	Discussion



12:30 pm - 1:30 pm	Lunch
1:30 pm - 4:00 pm	Free Time
3:00 pm - 4:00 pm	<p>Power Hour</p> <p><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></p> <p>Organizers: Michelle Monje (Stanford University, USA) and Alison Lloyd (MRC Laboratory for Molecular Cell Biology, University College London, United Kingdom)</p>
4:00 pm - 6:00 pm	Poster Session
6:00 pm - 7:00 pm	Dinner
7:30 pm - 9:30 pm	<p>Glia as Mediators of Circuit Dysfunction</p> <p>Discussion Leader: Philip Haydon (Tufts University, USA)</p>
7:30 pm - 7:50 pm	<p>Michael Salter (University of Toronto, Canada)</p> <p>"Sex Differences in Microglia-Neuron Signaling in Chronic Pain"</p>
7:50 pm - 8:00 pm	Discussion
8:00 pm - 8:20 pm	<p>Eric Huang (University of California, San Francisco, USA)</p> <p>"Progranulin and Microglia-Neuron Interactions in the Aging Brain"</p>
8:20 pm - 8:30 pm	Discussion
8:30 pm - 8:50 pm	<p>Susan Campbell (Virginia Tech, USA)</p> <p>"Glia Dysfunction in Epilepsy"</p>
8:50 pm - 9:00 pm	Discussion
9:00 pm - 9:10 pm	<p>Soyon Hong (Boston Children's Hospital / Harvard Medical School, USA)</p> <p>"How Microglia Mediate Early Synapse Loss in Alzheimer's Disease"</p>
9:10 pm - 9:15 pm	Discussion
9:15 pm - 9:25 pm	<p>Shane Liddelow (Stanford University, USA)</p> <p>"What Do Reactive Astrocytes Do?"</p>



9:25 pm - 9:30 pm	Discussion
Tuesday	
7:30 am - 8:30 am	Breakfast
9:00 am - 12:30 pm	Metabolic Control by Glia Discussion Leader: Bruce Ransom (University of Washington School of Medicine, USA)
9:00 am - 9:20 am	Bruno Weber (University of Zurich, Switzerland) "In Vivo Investigations of Neuron-Glia Interaction in Energy Metabolism"
9:20 am - 9:30 am	Discussion
9:30 am - 9:50 am	Klaus-Armin Nave (Max Planck Institute for Experimental Medicine, Germany) "Powering Axons: Novel Functions of Oligodendrocytes"
9:50 am - 10:00 am	Discussion
10:00 am - 10:20 am	Richard Ransohoff (Biogen, USA) "What's Happening with Biogen's Microglia"
10:20 am - 10:30 am	Discussion
10:30 am - 11:00 am	Coffee Break
11:00 am - 11:20 am	Mark Verheijen (Center for Neurogenomics and Cognitive Research (CNCR), Vrije Universiteit Amsterdam, The Netherlands) "Synapse Development Is Dependent on Lipids Derived from Astrocytes and Diet"
11:20 am - 11:30 am	Discussion
11:30 am - 11:50 am	Michael Robinson (Children's Hospital of Philadelphia / University of Pennsylvania, USA) "Mitochondrial Dynamics and Ca Signals in Astrocyte Processes"
11:50 am - 12:00 pm	Discussion



12:00 pm - 12:10 pm	Joseph Dougherty (Washington University School of Medicine, USA) "Localization and Activity Dependent Regulation of Translation in Astrocytes"
12:10 pm - 12:15 pm	Discussion
12:15 pm - 12:25 pm	Marko Kreft (University of Ljubljana, Slovenia) "Insulin Modulates Cytoplasmic Glucose and Glycogen Levels in Astrocytes"
12:25 pm - 12:30 pm	Discussion
12:30 pm - 1:30 pm	Lunch
1:30 pm - 4:00 pm	Free Time
4:00 pm - 6:00 pm	Poster Session
6:00 pm - 7:00 pm	Dinner
7:30 pm - 9:30 pm	Glial Contributions to Neurovascular Coupling Discussion Leader: Brian MacVicar (University of British Columbia, Canada)
7:30 pm - 7:50 pm	Grant Gordon (University of Calgary, Canada) "Behavioral State Dependence of Cortical Astrocyte Ca ²⁺ Signals During Neurovascular Coupling"
7:50 pm - 8:00 pm	Discussion
8:00 pm - 8:20 pm	Eric Newman (University of Minnesota, USA) "Glial Cell Regulation of Blood Flow: Fact or Fantasy"
8:20 pm - 8:30 pm	Discussion
8:30 pm - 8:50 pm	Serge Charpak (Paris Descartes University, France) "Glial and Neuronal Control of Brain Blood Flow"
8:50 pm - 9:00 pm	Discussion



9:00 pm - 9:20 pm	Elizabeth Hillman (Columbia University, USA) "The Role of the Vascular Endothelium in Neurovascular Coupling – A Unifying Model?"
9:20 pm - 9:30 pm	Discussion
Wednesday	
7:30 am - 8:30 am	Breakfast
9:00 am - 12:30 pm	Structural and Functional Heterogeneity Among Glia Discussion Leader: Helmut Kettenmann (Max Delbruck Center for Molecular Medicine, Germany)
9:00 am - 9:20 am	Frank Kirchhoff (University of Saarland, Germany) "Diversity of Signalling in Oligodendrocytes"
9:20 am - 9:30 am	Discussion
9:30 am - 9:50 am	Ye Zhang (University of California, Los Angeles, USA) "What Do Human Astrocytes Do?"
9:50 am - 10:00 am	Discussion
10:00 am - 10:20 am	Patrizia Casaccia (Icahn Medical School at Mount Sinai, USA) "Role of Histone Methylation in Oligodendrocyte Function"
10:20 am - 10:30 am	Discussion
10:30 am - 11:00 am	Coffee Break
11:00 am - 11:20 am	Mario Capecchi (University of Utah, USA) "Role of Hoxb8-Microglia on Neural Circuitry"
11:20 am - 11:30 am	Discussion
11:30 am - 11:50 am	Keith Murai (McGill University, Canada) "Creating Astrocyte Diversity in the Mature Brain: Implications for Circuit Function and Brain Disease"
11:50 am - 12:00 pm	Discussion
12:00 pm - 12:20 pm	Marc Freeman (Vollum Institute, USA) "CNS Glia in Neural Circuit Assembly and Function"



12:20 pm - 12:30 pm	Discussion
12:30 pm - 1:30 pm	Lunch
1:30 pm - 4:00 pm	Free Time
4:00 pm - 6:00 pm	Poster Session
6:00 pm - 7:00 pm	Dinner
7:00 pm - 7:30 pm	Business Meeting <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	Glial Cell Development Discussion Leader: Kelly Monk (Washington University School of Medicine, USA)
7:30 pm - 7:50 pm	Sonia Garel (Ecole Normale Superieure, France) "Microglia in the Early Wiring of Cortical Circuits"
7:50 pm - 8:00 pm	Discussion
8:00 pm - 8:20 pm	Xianhua Piao (Boston Children's Hospital, Harvard Medical School, USA) "Microglia-Extracellular Matrix-Oligodendrocyte Cross-Talk in Myelin Development and Repair"
8:20 pm - 8:30 pm	Discussion
8:30 pm - 8:50 pm	Cagla Eroglu (Duke University Medical Center, USA) "How Do Synapses Control Astrocyte Development?"
8:50 pm - 9:00 pm	Discussion
9:00 pm - 9:20 pm	Maxwell Heiman (Harvard Medical School / Boston Children's Hospital, USA) "Glial Development in <i>C. elegans</i> "
9:20 pm - 9:30 pm	Discussion



7:30 am - 8:30 am	Breakfast
9:00 am - 12:30 pm	<p>New Technologies for Understanding Glial Cell Function</p> <p>Discussion Leader: Dwight Bergles (Johns Hopkins University School of Medicine, USA)</p>
9:00 am - 9:20 am	<p>Axel Nimmerjahn (Salk Institute for Biological Studies, USA)</p> <p>"Neuron-Astrocyte Communication in Spinal Cord of Behaving Mice"</p>
9:20 am - 9:30 am	Discussion
9:30 am - 9:50 am	<p>Steve McCarroll (Harvard Medical School, USA)</p> <p>"Diversity Among and Within Multiple Classes of Glia"</p>
9:50 am - 10:00 am	Discussion
10:00 am - 10:20 am	<p>Anne Schaefer (Friedman Brain Institute, Icahn School of Medicine at Mount Sinai, USA)</p> <p>"Epigenetic Control of Microglia Specification"</p>
10:20 am - 10:30 am	Discussion
10:30 am - 11:00 am	Coffee Break
11:00 am - 11:20 am	<p>Baljit Khakh (University of California, Los Angeles, USA)</p> <p>"Astrocyte Calcium Signaling in Neural Circuits Explored with a Novel Calcium Silencing Approach"</p>
11:20 am - 11:30 am	Discussion
11:30 am - 11:50 am	<p>Ko Matsui (Tohoku University, Japan)</p> <p>"Optogenetic Control of Astrocytes and Mind"</p>
11:50 am - 12:00 pm	Discussion
12:00 pm - 12:10 pm	<p>Amit Agarwal (Johns Hopkins University, USA)</p> <p>"New Conditional Mouse Lines for Studying Glial Cell Physiology"</p>
12:10 pm - 12:15 pm	Discussion
12:15 pm - 12:30 pm	General Discussion



12:30 pm - 1:30 pm	Lunch
1:30 pm - 4:00 pm	Free Time
4:00 pm - 6:00 pm	Poster Session
6:00 pm - 7:00 pm	Dinner
7:30 pm - 9:30 pm	Gliogenesis in Health and Disease Discussion Leader: Beth Stevens (Boston Children's Hospital, USA)
7:30 pm - 7:50 pm	Hui Zong (University of Virginia, USA) "Homeostatic Interaction Among OPCs as the Basis of Cell Competition that Drives Gliomagenesis"
7:50 pm - 8:00 pm	Discussion
8:00 pm - 8:20 pm	Michelle Monje (Stanford University, USA) "Neuronal Activity Promotes Proliferation of Healthy and Malignant Glial Cells"
8:20 pm - 8:30 pm	Discussion
8:30 pm - 8:50 pm	Alison Lloyd (MRC Laboratory for Molecular Cell Biology, University College London, United Kingdom) "Schwann Cell Orchestration of Nerve Regeneration"
8:50 pm - 9:00 pm	Discussion
9:00 pm - 9:20 pm	Harald Sontheimer (Virginia Tech, USA) "Reactive Astrocytes as 'Drivers' of Epilepsy"
9:20 pm - 9:30 pm	Discussion
Friday	
7:30 am - 8:30 am	Breakfast
9:00 am	Departure

Contributors



 <p>Gordon Research Conferences</p>	 <p>Carl Storm Underrepresented Minority Fellowship</p>	 <p>NIH National Institute of Neurological Disorders and Stroke</p>
 <p>ZEISS</p>	 <p>OTONOMY</p>	 <p>THORLABS</p>
 <p>BioLegend</p>	 <p>MS National Multiple Sclerosis Society</p>	 <p>CellPress</p>
 <p>MERCK</p>	 <p>Biogen</p>	 <p>VirginiaTech School of Neuroscience</p>
 <p>Center for Glial Biology in Health, Disease, and Cancer</p>	 <p>Genentech A Member of the Roche Group</p>	 <p>COHERENT</p>

