

Molecular Pharmacology

Gordon Research Conference

GPCRs: From Single Molecules to New Forms of Treatment

Dates

March 12-17, 2017

Location

Renaissance Tuscany Il Ciocco
Lucca (Barga), Italy

Organizers

Chairs:

Martin J. Lohse & Jurgen Wess

Vice Chairs:

Roger K. Sunahara & Laura M. Bohn

Application Deadline

This meeting is currently oversubscribed (full). You may still submit an application. However, it will only be considered by the Conference Chair if more seats become available due to cancellations.

Meeting Description

The Gordon Research Conference (GRC) on Molecular Pharmacology will highlight the most recent advances in the area of G protein-coupled receptors (GPCRs), both at the molecular and translational (drug development) level. Topics will include new high-resolution structural investigations, single molecule studies, mechanisms involved in GPCR signaling, compartmentation, and activation, and studies of novel physiological and pathophysiological roles of specific GPCRs. Particular focus will be put on the identification of druggable targets for several important diseases, including various diseases of the CNS, diabetes, and obesity, and the use of emerging new technologies useful for drug development. Experts from neighboring fields will present new technologies and approaches not yet widely used in the GPCR field.

The program will include the following general areas: i) novel GPCR structures and potential clinical relevance, ii) single molecule studies, iii) GPCR signaling and compartmentation, iv) novel technologies for GPCR research and drug development, v) GPCR signaling in physiology and disease with primary emphasis on identifying new drug targets, and (vi) diversity of GPCR ligands and resulting clinical implications.

The GRC on Molecular Pharmacology is one of the key meetings in the GPCR field. The 2017 meeting will take place in the heart of Tuscany, Italy (near Pisa/Lucca). This meeting generally attracts an enthusiastic and diverse group of students, postdoctoral fellows and faculty at all stages to create a scientifically exciting and collegial atmosphere to advance novel ideas and concepts in the GPCR field. The meeting will also feature several informal interactive sessions to encourage interactions between junior and senior participants.

Related Meeting



This GRC will be held in conjunction with the "**Molecular Pharmacology**" 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 **Structural Basis of GPCR Function**

Discussion Leader: **Roger Sunahara** (University of California, San Diego School of Medicine, USA)

7:40 pm - 7:50 pm Introduction by Discussion Leader

7:50 pm - 8:20 pm **Tracy Handel** (University of California, San Diego, USA)
"Structure, Activation and Inhibition of Chemokine Receptors"

8:20 pm - 8:30 pm Discussion

8:30 pm - 9:20 pm **Brian Kobilka** (Stanford University, USA)
"The Role of Protein Dynamics in GPCR Action"

9:20 pm - 9:30 pm Discussion

Monday

7:30 am - 8:30 am Breakfast

9:00 am - 12:30 pm **Novel GPCR Structures and Structure-Based Drug Design**

Discussion Leader: **Gebhard Schertler** (Paul Scherrer Institute / ETH Zurich, Switzerland)

9:00 am - 9:10 am Introduction by Discussion Leader

9:10 am - 9:35 am **Qing Fan** (Columbia University Medical Center, USA)
"Structural Mechanisms of Ligand Activation in Class C GPCRs"

9:35 am - 9:45 am Discussion

9:45 am - 10:10 am **Fiona Marshall** (Heptares Therapeutics, United Kingdom)
"X-Ray Structures of GPCRs Provide Insights into New Binding Sites for Drug Discovery"

10:10 am - 10:20 am Discussion

10:20 am - 10:55 am Coffee Break

10:55 am - 11:20 am **Patrick Sexton** (Monash University, Australia)
"A Structural Understanding of Class B GPCR Activation and G Protein Interaction"

11:20 am - 11:30 am Discussion

11:30 am - 11:55 am **Brian Shoichet** (University of California, San Francisco, USA)
"Structure-Based Screens for New Chemotypes Conferring New GPCR Biology"

11:55 am - 12:05 pm Discussion

12:05 pm - 12:20 pm **Cedric Leyrat** (Institute for Functional Genomics (IGF), France)
"Structure and Function of Adiponectin Receptors"

12:20 pm - 12:30 pm Discussion

12:30 pm Lunch

1:30 pm - 4:30 pm Free Time

4:30 pm - 6:00 pm Poster Session

6:00 pm - 8:00 pm **Single Molecule Studies**

Discussion Leader: **Jean-Philippe Pin** (Institute for Functional Genomics (IGF), University of Montpellier, France)

6:00 pm - 6:10 pm Introduction by Discussion Leader

6:10 pm - 6:35 pm **Akihiro Kusumi** (Kyoto University, Japan)
"Transient GPCR Dimers and Their Functions as Revealed by Single-Molecule Tracking"

6:35 pm - 6:45 pm Discussion

6:45 pm - 7:10 pm **Benjamin Kaupp** (Center of Advanced European Studies and Research, Germany)
"Oligomeric Architecture of Membrane Receptors"

7:10 pm - 7:20 pm Discussion

7:20 pm - 7:35 pm Short Talk Selected from Poster Abstracts

7:35 pm - 7:40 pm Discussion

7:40 pm - 7:55 pm Short Talk Selected from Poster Abstracts

7:55 pm - 8:00 pm Discussion

8:00 pm Dinner

Tuesday

7:30 am - 8:30 am Breakfast

8:30 am Group Photo

9:00 am - 12:30 pm **Novel Tools and Technologies for GPCR Research**

Discussion Leaders: **JoAnn Trejo** (University of California, San Diego, USA) and **Michel Bouvier** (Institute for Research in Immunology and Cancer, Université de Montréal, Canada)

9:00 am - 9:10 am Introduction by Discussion Leader

9:10 am - 9:35 am **Bryan Roth** (UNC School of Medicine, University of North Carolina at Chapel Hill, USA)
"Towards a Molecular Understanding of Psychoactive Drug Actions at GPCRs"

9:35 am - 9:45 am Discussion

9:45 am - 10:10 am **Anne Andrews** (University of California, Los Angeles, USA)
"5-HT_{1A} Autoreceptor Control of Serotonin Signaling - Rethinking Modes of Inhibitory Feedback"

10:10 am - 10:20 am Discussion

10:20 am - 10:55 am Coffee Break

10:55 am - 11:20 am **Meritxell Canals** (Monash University, Australia)
"Control of Spatio-Temporal Signaling at the mu-Opioid Receptor"

11:20 am - 11:30 am Discussion

11:30 am - 11:55 am **Kathleen Caron** (University of North Carolina at Chapel Hill, USA)
"RAMPs and Atypical Chemokine Receptors"

11:55 am - 12:05 pm Discussion

12:05 pm - 12:20 pm Short Talk Selected from Poster Abstracts

12:20 pm - 12:30 pm Discussion

12:30 pm Lunch

1:30 pm - 4:30 pm Free Time

4:30 pm - 6:00 pm Poster Session

6:00 pm - 8:00 pm **GPCRs: Signal Compartmentation**

Discussion Leader: **Alan Smrcka** (University of Michigan, USA)

6:00 pm - 6:10 pm Introduction by Discussion Leader

6:10 pm - 6:35 pm **Jean-Pierre Vilardaga** (University of Pittsburgh School of Medicine, USA)
"Endosomal and Mitochondrial GPCR Signaling: Mechanisms and Biological Significance"

6:35 pm - 6:45 pm Discussion

6:45 pm - 7:10 pm **Manuela Zaccolo** (University of Oxford, United Kingdom)
"cAMP: From Long-Range Messenger to Nano-Domain Signalling"

7:10 pm - 7:20 pm Discussion

7:20 pm - 7:45 pm **Jin Zhang** (University of California, San Diego, USA)
"Compartmentalized cAMP/PKA Signaling in Living Cells"

7:45 pm - 8:00 pm Discussion

8:00 pm Dinner

Wednesday

7:30 am - 8:30 am Breakfast

9:00 am - 12:30 pm **Central GPCRs as Drug Targets**

Discussion Leader: **Marc Caron** (Duke University Medical Center, USA)

9:00 am - 9:10 am Introduction by Discussion Leader

9:10 am - 9:35 am **Kathryn Cunningham** (University of Texas Medical Branch, USA)
"Allosteric Modulators of the Serotonin 5-HT_{2C} Receptor"

9:35 am - 9:45 am Discussion

9:45 am - 10:10 am **Gregory Scherrer** (Stanford University, USA)
"Opioid Receptor Mechanisms Controlling Neurotransmission in Pain Pathways"

10:10 am - 10:20 am Discussion

10:20 am - 10:55 am Coffee Break

10:55 am - 11:20 am **Michael Bruchas** (Washington University School of Medicine, USA)
"Optical Approaches for Dissecting GPCR Signalling in Neural Circuits"

11:20 am - 11:30 am Discussion

11:30 am - 11:55 am **Jeffrey Witkin** (Lilly Research Laboratories, USA)

"Potential Application of mGlu Modulators for Treatment of Neurological and Psychiatric Disorders"

- 11:55 am - 12:05 pm Discussion
- 12:05 pm - 12:20 pm Short Talk Selected from Poster Abstracts
- 12:20 pm - 12:30 pm Discussion
- 12:30 pm Lunch
- 1:30 pm - 4:30 pm Free Time
- 4:30 pm - 6:00 pm Poster Session

Diversity of GPCR Ligands: Clinical Implications

Discussion Leader: **Laura Bohn** (The Scripps Research Institute, USA)

- 6:00 pm - 6:10 pm Introduction by Discussion Leader
- 6:10 pm - 6:35 pm **Arthur Christopoulos** (Monash University, Australia)
"Structural and Translational Studies of GPCR Allostery"
- 6:35 pm - 6:45 pm Discussion
- 6:45 pm - 7:10 pm **Jeff Conn** (Vanderbilt University, USA)
"Allosteric Modulators of GPCRs for the Treatment of CNS Disorders"
- 7:10 pm - 7:20 pm Discussion
- 7:20 pm - 7:45 pm **Thue Schwartz** (University of Copenhagen, Denmark)
"Novel Ligands for Metabolite GPCRs"
- 7:45 pm - 8:00 pm Discussion
- 8:00 pm Dinner

Thursday

- 7:30 am - 8:30 am Breakfast
- 8:30 am - 9:00 am 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

9:00 am - 12:30 pm GPCRs and Metabolism: Clinical Implications

Discussion Leader: **Graeme Milligan** (University of Glasgow, United Kingdom)

- 9:00 am - 9:10 am Introduction by Discussion Leader
- 9:10 am - 9:35 am **Alexander Pfeifer** (University of Bonn, Germany)
"GPCRs in Brown Adipose Tissue"
- 9:35 am - 9:45 am Discussion
- 9:45 am - 10:10 am **Stefan Offermanns** (Max Planck Institute for Heart and Lung Research, Germany)
"Autocrine Regulation of Metabolic Functions Through Metabolite GPCRs"
- 10:10 am - 10:20 am Discussion
- 10:20 am - 10:55 am Coffee Break
- 10:55 am - 11:20 am **Lora Heisler** (University of Aberdeen, United Kingdom)
"5-HT_{2C} Receptor: A Target for Obesity and Type 2 Diabetes Treatment"
- 11:20 am - 11:30 am Discussion
- 11:30 am - 11:55 am **Michael Krashes** (National Institutes of Health, USA)
"Chemogenetic Control of Energy Balance"

- 11:55 am - 12:05 pm Discussion
- 12:05 pm - 12:20 pm Short Talk Selected from Poster Abstracts
- 12:20 pm - 12:30 pm Discussion
- 12:30 pm Lunch
- 1:30 pm - 4:30 pm Free Time
- 4:30 pm - 6:00 pm Poster Session
- 6:00 pm - 8:00 pm **GPCR Activation and Signaling**

Discussion Leader: **Paul Insel** (University of California, San Diego, USA)

- 6:00 pm - 6:10 pm Introduction by Discussion Leader
- 6:10 pm - 6:40 pm **Torsten Schoeneberg** (Leipzig University, Germany)
"What Are They Waiting For? - Signaling of GPCRs with Large Ectodomains"
- 6:40 pm - 6:50 pm Discussion
- 6:50 pm - 7:40 pm **Robert Lefkowitz** (Howard Hughes Medical Institute / Duke University Medical Center, USA)
"G-Protein Coupled Receptors (GPCRs) and Arrestin Coupled Receptors (ACRs): A Tale of Two Transducers"
- 7:40 pm - 8:00 pm Discussion
- 8:00 pm Dinner

Friday

- 7:30 am - 8:30 am Breakfast
- 9:00 am Departure