



Emerging Perspectives on the Role of the Amygdala in Regulating Higher-Order Behavior and Neuropsychiatric Disease

August 6 - 11, 2017

Chairs

Andrew Holmes

Vice Chair

Kay M. Tye

Stonehill College

320 Washington Street
Easton, MA, US

Conference Description

The amygdala is a brain structure known to play a pivotal role in emotion, and has become the focus of interest to neuroscientists and the lay public in recent years. Rapid progress has been made in elucidating the cellular and molecular plasticity mechanisms involved in the acquisition and expression of conditioned fear, largely using rodent models. However, there has been growing appreciation of the critical role of the amygdala in reward processing and other brain functions that become abnormal in addiction. There is marked overlap in the amygdala plasticity mechanisms found to be maladaptive in models of, for example, drug abuse and anxiety. Added to this is a compelling body of clinical evidence implicating the amygdala in disorders ranging from PTSD, autism to substance abuse and other addictions. The meeting will focus on research investigating the role of the amygdala in both normal and pathological processes spanning multiple levels of neural organization - from molecular and cellular mechanisms at one end, to circuits, networks, behavior and disease at the other. An overarching rationale for this meeting is to bring together amygdala scientists and scientist-clinicians with differing scientific questions and approaches that have advanced our understanding of the biological basis of behavior and illness. Meaningful interactions between scientists with different questions, different techniques, and different levels of analysis, with clinician-scientists will serve as an impetus for new collaborations that may translate basic discovery research findings. The meeting will reflect on ongoing shift in psychiatry towards framing the study of mental illness in terms of aberrant neural circuit functions. The amygdala is recognized as a central node within brain systems



subserving an array of higher-order behaviors that are disturbed in various mental disorders. This meeting is expected to continue to be an exemplar for brain and psychiatric research over the coming years.

Related Meeting



This GRC will be held in conjunction with the "Amygdala Function in Emotion, Cognition and Disease (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	
2:00 pm - 9:00 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	The Amygdala in Brain Function and Psychiatric Disease: What Do We Know and Where Are We Going? Discussion Leader: Kerry Ressler (McLean Hospital, Harvard Medical School, USA)
7:40 pm - 8:00 pm	Andreas Luthi (Friedrich Miescher Institute, Switzerland) "Neuronal Circuit Mechanisms for Associative Learning"
8:00 pm - 8:15 pm	Discussion
8:15 pm - 8:40 pm	Catherine Dulac (Harvard University / Howard Hughes Medical Institute, USA) "Neural Architecture of Social Behavior Circuits"
8:40 pm - 8:50 pm	Discussion



8:50 pm - 9:15 pm	George Koob (National Institute on Alcohol Abuse and Alcoholism, USA) "The Role of the Extended Amygdala in the Dark Side of Addiction"
9:15 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	The Networked Amygdala: The Amygdala's Place in Systems-Wide Brain Networks Discussion Leader: Denis Pare (Rutgers University, USA)
9:00 am - 9:20 am	Stephen Maren (Texas A&M University, USA) "Hippocampal-Prefrontal Circuit Mediating Relapse of Extinguished Fear"
9:20 am - 9:30 am	Discussion
9:30 am - 9:50 am	Cristina Alberini (New York University, USA) "Molecular Mechanisms of the Hippocampal-Amygdala-Medial Prefrontal Cortex System in Inhibitory Avoidance Memory"
9:50 am - 10:00 am	Discussion
10:00 am - 10:35 am	Coffee Break
10:35 am - 10:55 am	Mark Schnitzer (Stanford University, USA) "Neural Ensemble Dynamics Underlying a Long-Term Associative Fear Memory"
10:55 am - 11:05 am	Discussion
11:05 am - 11:25 am	Joshua Gordon (National Institute of Mental Health, NIH, USA) "Regulation of Fear Responses by a Prefrontal-Amygdala Circuit"
11:25 am - 11:35 am	Discussion



11:35 am - 11:55 am	Joshua Johansen (RIKEN Brain Science Institute, Japan) "Distinct Noradrenaline Cell Populations Coordinate Emotional and Flexible Learning States"
11:55 am - 12:05 pm	Discussion
12:05 pm - 12:20 pm	Mark Ansorge (Columbia University, USA) "Serotonin Modulates Maturation of Afferent Projections to the Amygdala"
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	Power Hour <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: Sheena Josselyn (Hospital for Sick Children / University of Toronto, Canada) and Jane Taylor (Yale University School of Medicine, USA)
4:00 pm - 6:00 pm	Poster Session
6:00 pm - 7:00 pm	Dinner
7:30 pm - 9:30 pm	The Engrammatic Amygdala: Neuronal Codes and Ensembles Underlying Behavior Discussion Leader: Ron Stoop (University of Lausanne, Switzerland)
7:30 pm - 7:50 pm	Sheena Josselyn (Hospital for Sick Children / University of Toronto, Canada) "Making Memories"
7:50 pm - 8:00 pm	Discussion
8:00 pm - 8:20 pm	Pankaj Sah (Queensland Brain Institute, University of Queensland, Australia) "Coding of Cued Fear by Neural Ensembles in the Lateral Amygdala" 

8:20 pm - 8:30 pm	Discussion
8:30 pm - 8:50 pm	Rony Paz (Weizmann Institute of Science, Israel) "Coding with Temporal Sequences in the Primate Amygdala"
8:50 pm - 9:00 pm	Discussion
9:00 pm - 9:20 pm	Cyril Herry (Neurocentre Magendie, INSERM U862, France) "Cooperation Among Prefrontal and Amygdala Inputs to the Periaqueductal Gray to Regulate Fear Behavior"
9:20 pm - 9:30 pm	Discussion
Tuesday	
7:30 am - 8:30 am	Breakfast
9:00 am - 12:30 pm	The Rewarded Amygdala: Amygdala Control of Positive Valence in Healthy and Drug-Exposed Brains Discussion Leader: Thomas Kash (University of North Carolina at Chapel Hill, USA)
9:00 am - 9:20 am	Bernard Balleine (University of New South Wales, Australia) "Amygdala-Striatal Interactions in Predicted Value and Choice"
9:20 am - 9:30 am	Discussion
9:30 am - 9:50 am	Alicia Izquierdo (University of California, Los Angeles, USA) "Basolateral Amygdala and Orbitofrontal Cortex in Expected and Unexpected Changes in Outcome Value"
9:50 am - 10:00 am	Discussion
10:00 am - 10:15 am	Peter Rudebeck (Icahn School of Medicine at Mount Sinai, USA) "Cingulate-Amygdala-Striatal Circuits in Anticipation and Receipt of Reward"
10:15 am - 10:25 am	Discussion
10:25 am - 11:00 am	Coffee Break



11:00 am - 11:20 am	Daniel Salzman (Columbia University, USA) "Shared Neural Coding for Social Hierarchy and Reward in Primate Amygdala"
11:20 am - 11:30 am	Discussion
11:30 am - 11:50 am	Markus Heilig (Linköping University, Sweden) "An Amygdala-Mediated Molecular Mechanism for Choosing Alcohol over Natural Rewards"
11:50 am - 12:00 pm	Discussion
12:00 pm - 12:20 pm	Kate Wassum (University of California, Los Angeles, USA) "Amygdala-Cortical Circuits in Reward Expectation and Valuation"
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
7:30 pm - 9:30 pm	The Developing Amygdala: Dynamic Regulation of Behavior over Development Discussion Leader: Katalin Gothard (University of Arizona, USA)
7:30 pm - 7:50 pm	Nim Tottenham (Columbia University, USA) "Human Amygdala Functional Development and Early Environmental Influences"
7:50 pm - 8:00 pm	Discussion
8:00 pm - 8:20 pm	Catherine Hartley (New York University, USA) "Dynamic Changes in Learning Underlying the Development of Behavioral Control"
8:20 pm - 8:30 pm	Discussion



8:30 pm - 8:50 pm	Regina Sullivan (Nathan S. Kline Institute / NYU Langone Medical Center, USA) "Transitions in Maternal Regulation of the Infant Amygdala"
8:50 pm - 9:00 pm	Discussion
9:00 pm - 9:20 pm	Rick Richardson (University of New South Wales, Australia) "Accelerated Maturation of Neural Circuitry Underlying Memory Expression: Effects of Probiotics"
9:20 pm - 9:30 pm	Discussion
Wednesday	
7:30 am - 8:30 am	Breakfast
9:00 am - 12:30 pm	The Micro-Circuitry of the Amygdala: Intrinsic Circuits and Cell Populations Mediating Amygdala Functions Discussion Leader: Vadim Bolshakov (Harvard Medical School, USA)
9:00 am - 9:20 am	Marie Monfils (University of Texas at Austin, USA) "Social Transmission of Fear in Rats: Fear Conditioning by Proxy"
9:20 am - 9:35 am	Discussion
9:35 am - 9:55 am	Alexei Morozov (Virginia Tech, USA) "Metaplasticity of the Prefrontal-Amygdala Pathway as a Two-Hit Mechanism of Pathological Fear"
9:55 am - 10:10 am	Discussion
10:10 am - 10:25 am	Rebecca Shansky (Northeastern University, USA) "Resting State Functional Connectivity in the Rodent Amygdala: A Predictor of Divergent Behavioral Phenotypes?"
10:25 am - 10:35 am	Discussion
10:35 am - 11:05 am	Coffee Break
11:05 am - 11:25 am	Jane Taylor (Yale University School of Medicine, USA) "Amygdalar Targets of Memory Reconsolidation Processes that Reduce Cue-Induced Drug-Seeking Behavior"



11:25 am - 11:40 am	Discussion
11:40 am - 11:55 am	Anna Beyeler (University of Bordeaux, France) "Functional and Anatomical Diversity in the Basolateral Amygdala"
11:55 am - 12:05 pm	Discussion
12:05 pm - 12:20 pm	Ingrid Ehrlich (University of Tuebingen, Germany) "Amygdala Intercalated Cell Circuits and Their Role in Fear"
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	The Stressed Amygdala: Amygdala Responses and Regulation of Stressful Experience Discussion Leader: Matthew Hill (Hotchkiss Brain Institute, Canada)
7:30 pm - 7:50 pm	Michael Fanselow (University of California, Los Angeles, USA) "Neural Mechanisms of Induction and Expression of Stress-Enhanced Fear Learning, an Animal Model of PTSD"
7:50 pm - 8:00 pm	Discussion
8:00 pm - 8:20 pm	Alon Chen (Max-Planck-Institut für Psychiatrie, Germany) "The Role of the Medial Amygdala in Regulating Socio-Emotional Balance"
8:20 pm - 8:30 pm	Discussion



8:30 pm - 8:50 pm	Sachin Patel (Vanderbilt University, USA) "Stress Modulation of Amygdala Endocannabinoid Signaling"
8:50 pm - 9:00 pm	Discussion
9:00 pm - 9:20 pm	Shona Chattarji (National Centre for Biological Sciences (NCBS), India) "Trumping Fear: What Goes up Must Come Down"
9:20 pm - 9:30 pm	Discussion
Thursday	
7:30 am - 8:30 am	Breakfast
9:00 am - 12:30 pm	The Fearful Amygdala: Threat Predictability, Flexibility, Discrimination and Inhibition Discussion Leader: Haruhiko Bito (University of Tokyo, Japan)
9:00 am - 9:20 am	Chris Pape (University of Muenster, Germany) "Synaptic Circuits of the Extended Amygdala Impacting Responses to Predictable and Unpredictable Threat"
9:20 am - 9:30 am	Discussion
9:30 am - 9:50 am	Larry Zweifel (University of Washington, USA) "Dopamine Encodes Uncertainty in Fear Generalization"
9:50 am - 10:00 am	Discussion
10:00 am - 10:15 am	Daniela Schiller (Icahn School of Medicine at Mount Sinai, USA) "Flexibility of Threat Learning"
10:15 am - 10:20 am	Discussion
10:20 am - 10:50 am	Coffee Break
10:50 am - 11:10 am	Gregory Quirk (University of Puerto Rico, Puerto Rico) "Avoiding Danger at All Costs"
11:10 am - 11:20 am	Discussion



11:20 am - 11:40 am	Roger Clem (Icahn School of Medicine at Mount Sinai, USA) "Inhibitory Neuronal Substrates of Threat Learning"
11:40 am - 11:50 am	Discussion
11:50 am - 12:05 pm	Mario Penzo (National Institute of Mental Health, NIH, USA) "Inhibitory Control of Aversive Memory Formation"
12:05 pm - 12:10 pm	Discussion
12:10 pm - 12:25 pm	Leon Reijmers (Tufts University, USA) "Cellular and Oscillatory Substrates of Fear Extinction Learning"
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	The Dark Side of the Amygdala: The Amygdala's Role in Addiction, Aggression and Defense Discussion Leader: Stan Floresco (University of British Columbia, Canada)
7:30 pm - 7:50 pm	Yavin Shaham (Intramural Research Program, National Institute on Drug Abuse, NIH, USA) "Role of Central Amygdala and Anterior Insula in Relapse After Voluntary Abstinence"
7:50 pm - 8:00 pm	Discussion
8:00 pm - 8:20 pm	Nicholas Gilpin (LSU Health Sciences Center New Orleans, USA) "Central Amygdala Regulation of Alcohol Withdrawal Hyperalgesia"
8:20 pm - 8:30 pm	Discussion



8:30 pm - 8:50 pm	Ivan de Araujo (The John B. Pierce Laboratory / Yale University, USA) "Central Amygdala and the Motor Circuits Controlling Hunting and Feeding"
8:50 pm - 9:00 pm	Discussion
9:00 pm - 9:20 pm	Bo Li (Cold Spring Harbor Laboratory, USA) "The Central Amygdala Circuits in Learning and Expression of Defensive Responses"
9:20 pm - 9:30 pm	Discussion
Friday	
7:30 am - 8:30 am	Breakfast
9:00 am	Departure

Contributors

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DEDICATED RESPECT
DUTY ALWAYS
SERVICE COUNTRY
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