

Large-Scale Brain Networks and Substance Use Disorders

Organizers:

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Substance use disorders (SUDs) are associated with an intricate network of brain regions, indicative of a complex underlying etiology, and neuroimaging tools that enable the monitoring of network function have therefore been particularly helpful in unraveling some of the essential neurobiology. Resting state functional connectivity (rsFC) allows researchers to examine the integrity of neural circuits in the absence of a task. rsFC techniques have offered unique insights into the spatiotemporal dynamics of multiple brain networks and into their role in normative function as well as in neuropsychiatric disorders. Within the context of SUDs, rsFC analysis already appears to be a promising technique for uncovering differences in neurocircuitry central to chronic substance use as well as relapse and recovery from SUDs (Fedota et al., 2015). Recently, the field has witnessed multiple attempts at probing SUD-related circuits from a large-scale network or whole-brain perspective that offer novel and promising insights into SUD neurobiology. With exciting new experimental and analytical techniques related to rsFC on the horizon, now is an opportune time to assess the success of rsFC analyses in SUD research thus far, and to consider possible directions for the future. The goal of the proposed panel is to highlight important insights gleaned from applying large-scale network approaches to understanding SUD-related neurocircuitry, with an emphasis on cutting-edge techniques in the field. The overall mission of the panel is to offer an alternative perspective to the study of SUDs that could speak to new targets for treatment development.

Symposia Schedule:

14:45-15:00

Large-scale resting state networks involved in nicotine dependence

Amy Janes, McLean Hospital, Belmont, MA, United States

15:00-15:15

Cognitive Functioning as a Marker of Resting-State Connectivity in Cocaine Addiction

Rita Goldstein, Ph.D., Icahn School of Medicine at Mount Sinai, New York, NY, United States

15:15-15:30

Beyond reward learning: A network-based view of fronto-striatal interactions in pain motivation

Tor Wager, Department of Psychology and Neuroscience, University of Colorado at Boulder, Boulder, CO, United States

15:30-15:45

Using causal neuroimaging to map mechanisms of substance use disorders: Insights from whole-brain computational modelling

Morten Kringelbach, University of Oxford/Aarhus University, Oxford, United Kingdom/Aarhus, Denmark

15:45-16:00

Questions and Answers