Summary Report of the "Measurement and analysis of cortical networks" Satellite Event

The Satellite Event, "Measurement and analysis of cortical networks," was held on Nov. 13, 2011 as a part of the Society for Neuroscience Annual Meeting in Washington, DC. The meeting was sponsored by NIMBioS and initiated by the organizers of the NIMBioS Working Group on Cortical Networks. The format was an open discussion about specific research directions related to cortical networks.

The focus of the Cortical Networks Working Group was explained and a brief overview of the Perspective Paper that the Group is writing, which addresses important open questions in the modeling of cortical networks, was presented. One issue that the attendees picked up on was the analysis of complex neural recordings. How does one represent and visualize such data in order to yield the right insights? Is a new mathematical language required to capture the behavior of a complex interconnected neural system? The need for an open-source software framework akin to the Virtual Cell project that would allow models of individual neurons to be interconnected in a vast network, mirroring the connectivity patterns of vertebrate brains, was discussed.

Approximately 30 people attended. At least half the group consisted of graduate students from leading universities. Cortical Networks Working Group members who attended were Ravi Rao, Ehud Kaplan, Youping Xiao and Maria Neimark-Geffen. Attendees to submit proposals for Working Groups and Workshops, and apply to participate in events organized by NIMBioS.

One of the many suggestions we received was from a student at UCSD who stressed the need for improving the computational literacy of students in the field of neuroscience. This concerns the need to advance data analysis and modeling skills, ranging from statistical analysis of large data sets, machine learning and classification techniques, as well as dynamical systems modeling approaches, in order to better understand the vast amount of data that is being collected. This will have implications in the design of new courses to educate the next generation of neuroscientists, which may be of interest to the NSF.

The meeting received positive feedback from attendees. Most agreed that the scope and goals of the meeting were distinct from other events, especially the computational neuroscience event. Several participants wanted to know if this event will be organized next year.