

**COME DISCOVER NEW ROLES FOR THE CEREBELLUM!**  
**POSTDOCTORAL POSITIONS AVAILABLE – PRINCETON NEUROSCIENCE INSTITUTE**

Sam Wang's laboratory at Princeton University (<http://synapse.princeton.edu>) has three fully funded positions available immediately to study new roles for the cerebellum. We study this problem in rodents with a wide variety of tools including in vivo two-photon microscopy, optogenetic circuit perturbation, virtual reality systems, and virus-based tracing methods. We seek dedicated and innovative individuals to work in the following areas.

**NONMOTOR ROLES OF THE CEREBELLUM.** The same cerebellar circuit motifs that control movement and balance may also have other functions, depending on their long-distance connections. For example, cerebellar regions that connect to prefrontal cortex might contribute to nonmotor processes. We are testing the idea that specific cerebellar zones play a key role in cognitive processing. We are imaging and perturbing cerebellar circuitry during performance of head-fixed tasks. We are also performing CLARITY-based transsynaptic tracing of long-distance pathways to understand the functional relationship linking cerebellum and forebrain.

**THE CEREBELLUM, SENSITIVE PERIODS, AND AUTISM.** Animal and clinical evidence suggest that the cerebellum guides the maturation of cognitive development. We wish to test whether sensitive-period disruption of cerebellum-forebrain communication can account for autism's key features. Projects use circuit silencing (*e.g.* DREADDs) and intensely quantitative behavioral monitoring. <http://bit.ly/CerebellumNeo>

**NEW METHODS FOR THE RAPID MONITORING OF BRAIN CIRCUITRY.** We are using "Fast-GCaMPs," which are the fastest-responding calcium indicator proteins made to date. We track activity in large numbers of cerebellar neurons at once during task performance. We use these probes in conjunction with nonnegative deconvolution methods for optimal decoding of neuronal activity. <http://bit.ly/fastgcamp>

The right individual for any of these positions will end up learning and using a combination of the methods mentioned above. The following skills are welcome: the quantitative study of animal behavior, cellular physiology, and in vivo imaging. More important is a track record of productivity and a willingness to work in a collaborative, computationally-oriented environment.

The new Princeton Neuroscience Institute provides a collegial environment for projects in circuit, systems, and cognitive neuroscience. Our work is supported by funding from the National Institutes of Health (R01, R21, and a U01 BRAIN Initiative grant), as well as the McKnight Foundation and the Nancy Lurie Marks Family Foundation. Work may involve collaboration with the laboratories of Carlos Brody, Lynn Enquist, Sebastian Seung, David Tank, and Ilana Witten, as well as with the nearby Lewis-Sigler Institute for Integrative Genomics and the Department of Molecular Biology. To learn more about the opportunities described above contact Sam Wang, [sswang@princeton.edu](mailto:sswang@princeton.edu).