Neuroscience Postdoc: Innovative Techniques and Circadian/Sleep Studies of Neurodevelopmental Disorders

Neuroscience Postdoctoral Position available January 1, 2019 in Johnson Laboratory at Vanderbilt University:

66% Effort: Innovative Luminescence Assay for Neural Activity: My laboratory has developed innovative techniques using luminescence and/or BRET (Bioluminescence Resonance Energy Transfer) to monitor gene expression or protein-protein interactions non-invasively. These luminescence techniques have significant advantages over fluorescence-based (and other) methodologies. We have extensively developed luminescence techniques for monitoring circadian gene expression patterns as well as assessing interactions among proteins in mammalian, plant, and bacterial cells. The current position is to further develop these state-of-the art techniques and apply them as non-invasive monitors of neural synaptic activity. See our recent publication in Nature Communications (PMCID: PMC5476805). Our reporters will be applied to answer fundamental neurobiological questions (including those relating to circadian rhythmicity) in conjunction with optogenetics.

33% Effort: Ube3a imprinting impairs circadian robustness in Angelman syndrome models. Ube3a expression constitutes a direct mechanistic connection between symptoms of a human neurological disorder and the central circadian clock mechanism. The lengthened circadian period leads to delayed phase, which could explain the short sleep duration and increased sleep onset latency of AS subjects. See our publication in Current Biology (PMCID: PMC4348236). These findings reveal potential treatments for sleep disorders in AS patients.

Experience with neurobiology and imaging, and standard molecular genetic techniques is desirable. There are excellent facilities and collaborations available within the Vanderbilt University system, including other laboratories that study circadian clocks & sleep (e.g., the labs of Doug McMahon, Terry Page, Jake Hughey, and Beth Malow) and/or that are developing advanced imaging techniques. Nashville is an exciting city with a low cost of living and many artistic opportunities (especially music) as well as close proximity to nature. For more information about my laboratory, see our website: http://www.cas.vanderbilt.edu/johnsonlab/. Interested applicants should contact Dr. Carl Johnson at: carl.h.johnson@vanderbilt.edu.