

## Harvard Medical School and Brigham & Women's Hospital Postdoctoral Position in Computational Neuroscience

A Postdoctoral Position in Computational Biology is available at the Neurogenomics Lab of Brigham & Women's Hospital and Harvard Medical School (Principal Investigator: Dr. Clemens Scherzer). This fully funded position is available for an initial two-year appointment with the possibility of extension. The Neurogenomics Lab is interdisciplinary - located at the intersection of genomics, computing, and neurology.

The goal of the Neurogenomics Lab is to decipher how the human genome programs brain cells and to determine how the normal flow of genetic information is impaired in Parkinson's and other brain diseases. We are building a personalized medicine for neurologic disease that harnesses genomic information to diagnose and treat the right patient with the right drug at the right time. Two of the major ongoing projects are BRAINCODE and the PD Genetic Predictors of Prognosis Consortium.

**BRAINCODE:** The BRAINCODE project's goal is to chart the flow of information from the entire human genome into a prototype brain cell-types - dopamine and pyramidal neurons. Genetic variation between more than 140 individuals is examined for correlation with differences in transcribed elements --- both protein-coding and non-coding --- to identify regions of the genome that influence whether, how, and how much a transcript is expressed in this specific cell type *in situ* in human brains. Transcriptomes of control and diseased brains are probed using laser-capture microdissection, ultra deep, ribominus total RNA sequencing, SNP arrays, \expression Quantitative Trait Locus analysis, and epigenetics. BRAINCODE will provide a high-resolution encyclopedia of transcribed elements in prototype cell-types in human brains, help to understand inherited susceptibility to Parkinson's, and highlight targets for precision therapies. Initial results indicate a vast universe of non-coding RNAs expressed in dopamine neurons and suggest a more diverse and complex transcriptional architecture than previously imagined.

**PD Genetic Predictors of Prognosis Consortium:** The progression of Parkinson's disease varies considerably between individual patients, ranging from a manageable functional decline to an aggressive course that leaves patients rapidly wheelchair bound or demented. This variation is a major source of noise and inefficiency in therapeutic trials. Predictors of progression are needed for tailored therapeutic trials and for precision medicine. In this project we are using next-generation genetics to delineate the genetic landscape of prognosis in patients with PD. This projects uses our 2,300+ longitudinal Harvard Biomarker Study and a network of longitudinal and biomarker studies.

You will join our computational neuroscience team comprising bioinformatics engineers, Fellows, students, and a statistician, and benefit from our integrated wet lab and translational research in our program.

The Laboratory is located in the Cambridge Biotech Hub near MIT, the Broad, and the Whitehead Institute with 15 min shuttle connections to the Harvard Medical School, Brigham & Women's Hospital, Massachusetts General Hospital.

**Your tasks:** We are looking for enthusiastic, highly motivated, science-driven and experienced postdoctoral fellows to join our team to unravel how the genome functions in the human brain and in patients with Parkinson's using next generation genetics, transcriptomics, epigenetics, network analysis, and data science. Moreover, you will participate in exome and whole genome sequencing studies designed to identify gene variants that predict prognosis in patients with Parkinson's.

**Your qualifications:** Applicants are expected to have (1) Ph. D. or equivalent doctoral degree with (2) proven research experience in bioinformatics and analyses of genome-wide data (whole genome sequencing, exome sequencing, RNA-seq, epigenetics, microRNA sequencing, ChIP-seq, eQTL, allele-specific gene expression, big data science). (3) A previous publication as first author is desirable. (4) Strong quantitative skills preferably in

computer science, bioinformatics, or statistics are necessary. Programming background is desirable. Excellent written English is advantageous.

***How to apply:* Please submit your application, including a statement of research interests, a biosketch, and one letter of reference to Clemens Scherzer at [cscherzer@rics.bwh.harvard.edu](mailto:cscherzer@rics.bwh.harvard.edu).**

Salary will be commensurate with experience.

**Application deadline:** August 31, 2015