

Expression of interest: Postdoc Position – The inactive X: discovering sex genes that influence female vulnerability to Alzheimer's disease

Seeking expressions of interest for a postdoctoral position with Dr. Rachel Buckley to study gene expression on the X chromosome and its association with Alzheimer's disease risk. This project is tied to a 5-year ongoing NIH New Innovator Award (DP2AG082342). Our studies utilize a variety of approaches, and for this project, are specifically interested in the intersection between multimodal imaging (structural and functional MRI and amyloid, tau positron emission tomography [PET]) and genomic expression on the X. Studies consistently show that women exhibit higher levels of tau than men. Women possess two X chromosomes, which has profound implications for sex-specific associations with neurodegenerative disease. To avoid 'overdosing' women with X-linked genes coming from two X chromosomes, one X is randomly silenced in each cell throughout the body. This process is incomplete, with some genes escaping this inactivation. In human women, approximately 30% of X-linked genes consistently escape inactivation across all tissue types. Of those inactive escaped genes, many are involved in the immune system. Of relevance to AD, many of these genes have been linked with neuroinflammatory pathways. These key pieces of evidence give rise to an innovative question: could inactive X escaped genes be the key to explaining female vulnerability to neuroimaging AD biomarkers? Could this mechanism occur via inflammatory pathways? And might this have downstream implications for cognitive decline? This position involves a heavy focus on genetics and neuroimaging and will involve analytics with pre-existing data, as well as extraction and RNA sequencing of samples from a very large clinical trial. Dr. Buckley is a member of the larger Harvard Aging Brain Study team, and this position would sit within the Data Informatics and Analysis team in HABS. Dr. Buckley's Twitter handle: @bucklr01.

Mentorship Environment:

Our research group values open communication, motivation, optimism, mutual respect, teamwork, and innovative thinking. Dr. Buckley is highly committed to individualized mentoring to help trainees achieve the most out of their postdoctoral candidature and to move forward in their career. In addition, this position will involve close collaboration with Dr. Hyun-Sik Yang at BWH, as well as Drs. Timothy Hohman and Logan Dumitrescu at Vanderbilt University Medical Center. The training environment will include: professional/career development, one-on-one meetings, group lab meetings, frequent seminars and journal clubs, opportunities to present work at national and international scientific conferences/meetings (namely, Human Amyloid Imaging, Alzheimer's Association International Conference, AD/PD, SfN), and manuscript preparation for publication in high impact journals. In addition, Dr. Buckley has a strong funding record and will strongly encourage and provide mentorship for postdoctoral fellowship opportunities and/or NIH K grants.

More about the position:

The position would be located with the Department of Neurology at the Massachusetts General Hospital (located at Martinos Center for Biomedical Imaging, Charlestown Navy Yard). Extensive opportunity to interact with the larger MGH, BWH and Harvard communities, as well as many other US and international collaborators. Expectation to be a part of, and contribute to, the ongoing operations of HABS and its constituent/adjacent sub-studies.

Requirements:

Those interested should have a Ph.D. in one of the following areas: Neuroscience, Biostatistics, Applied Mathematics, Neuroimaging, Genetics/Omics or related discipline. Highly motivated, a good communicator, strong internal drive to learn things for oneself, and comfortable with working as part of a larger collaborative team. A real necessity is a passion for the broad topic of science (not solely Alzheimer's disease), strong scientific writing and organizational skills, and a positive attitude. A background in Alzheimer's disease is beneficial but certainly not necessary.

We value diversity; underrepresented minorities are highly encouraged to reach out.

Expressions of interest should include a CV and a cover letter describing major achievements, technical skills, career goals (particularly within the next 5 years), and how your research interests align with the research scope described above. Please reach out to Dr. Rachel Buckley at rbuckley@mgh.harvard.edu