

**Postdoctoral fellow position:**  
**Understanding how the noradrenergic system contributes to Alzheimer's disease using  
cognitive computational modeling and multimodal neuroimaging  
at Massachusetts General Hospital / Harvard Medical School**

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The Athinoula A. Martinos Center for Biomedical Imaging, located within the Department of Radiology at Massachusetts General Hospital (MGH) and Harvard Medical School (HMS) in Boston, Massachusetts, has an opening for a highly qualified postdoctoral individual to work with Dr. Heidi Jacobs. The Jacobs lab is focused on improving the early detection and early treatment of Alzheimer's disease. The lab focuses on the neuromodulatory subcortical nuclei, in particular the locus coeruleus, using a variety of approaches, including 3T MRI, 7T MRI, PET imaging, pupil measurements, physiological recordings, blood-based markers, cognitive assessments and perturbational approaches, such as pharmacological manipulations and non-invasive vagus nerve stimulation.

**We are seeking a postdoctoral fellow** to investigate the neural mechanisms underlying how the noradrenergic locus coeruleus system contributes to tau progression and cognitive decline. This position is intended for candidates with demonstrated experience in cognitive computational, and/or biophysical modeling of neural dynamics, and linking these models to in vivo human neuroimaging. The project will involve integrating multimodal imaging (e.g., sMRI, fMRI, MRS, PET) with pupillometry and advanced modeling approaches, including dynamic causal modeling (DCM) and reinforcement learning, in observational and pharmacological manipulation studies. In parallel, the lab develops approaches to characterize heterogeneity and temporal trajectories of disease progression using large-scale, well-characterized longitudinal datasets and advanced computational modeling. The lab also evaluates specific monoaminergic PET tracers to characterize age- and Alzheimer's disease-related changes in the noradrenergic and serotonergic systems from multiple perspectives. The successful candidate will also have the opportunity to contribute to these ongoing projects, depending on their expertise and interests. The Jacobs Lab consists of a multidisciplinary team of two instructors, three postdocs, two PhD-students, two clinical research coordinators and one project manager. This position is funded by NIH and foundation grants.

The work in this project will be performed at the Athinoula A. Martinos Center for Biomedical Imaging, Charlestown Navy Yard. The candidate will be part of ongoing collaborations and work in a stimulating and inspiring environment. Our research group values open communication, motivation, optimism, mutual respect, teamwork, and innovative thinking. Dr. Jacobs is highly committed to individualized mentoring to help trainees achieve the most out of their postdoctoral candidature and to move forward in their career. At a minimum, the training environment will include professional development, one-on-one meetings, group lab meetings, frequent seminars and journal clubs, opportunities to present their work at national and international scientific conferences (i.e. Human Amyloid Imaging, Alzheimer's Association International Conference), collaborations with partners within and outside MGH, and manuscript preparation for publication in high-impact journals. Dr. Jacobs has a strong funding record and will strongly encourage and provide mentorship in grant applications.

**Requirements:** Candidates should hold a Ph.D. in Cognitive Neuroscience, Computational Modeling, Bio/medical Physics, Biomedical Engineering, Neuroimaging, or a related discipline. A strong publication record, including at least three first-author peer-reviewed publications with demonstrated research experience in neuroimaging combined with computational modeling approaches is required. Essential qualifications include: strong expertise in fMRI analyses and other neuroimaging methods (e.g. MRS, PET), advanced programming skills (e.g., Python, MATLAB), experience with computational modeling (e.g. cognitive computational modeling), a solid background in signal processing, and an ability to relate neuroimaging findings within a pathobiological framework of neurodegenerative diseases. The candidate should be highly motivated, a strong communicator (both verbally and in scientific writing), have an internal drive to learn independently, and be comfortable working as part of a larger collaborative team. A real necessity is a passion for science and a positive attitude. Experience in Alzheimer's disease or aging research would be beneficial.

**Apply:** The successful candidate will have joint appointments at MGH and HMS. If interested, please send your CV, letter describing interests, background, major achievements, skills, goals and contact information for three professional references. Please send application materials to Dr. Heidi Jacobs, Associate Professor of Radiology, at [hjacobsm@mgh.harvard.edu](mailto:hjacobs@mgh.harvard.edu)  
([www.heidijacobs.org](http://www.heidijacobs.org))

The logo for Heidi Jacobs LAB features a stylized blue 'H' followed by the text 'Heidi Jacobs LAB' in a handwritten-style font.