

**Department:** Neurosurgery

**Job Description:** Fully funded postdoctoral positions are immediately available in the laboratory of Dr. Stephen Harward in the Department of Neurosurgery at the Duke University School of Medicine. We are seeking candidates interested in leading projects based on advancing the development and application of focused ultrasound for non-invasive neuromodulation, ablation, and brain drug/gene delivery. The successful candidate will be an integral part of the research team, conducting independent experiments investigating focused ultrasound-based neuromodulation, presenting at weekly lab meetings and research conferences, and working with collaborators at Duke and beyond.

**Requirements:** Applicants should have a Ph.D., M.D., or equivalent title in biomedical science or a related field. A highly motivated, independent candidate with a passion for translational neuroscience is preferred. Expertise in neurobiology, electrophysiology, mechanotransduction, ultrasound, or *in vivo* mouse work is highly desirable but not required.

**Lab Background:** We are a high-energy, highly passionate translational neuroscience lab focused on understanding the role of synaptic plasticity in neurologic disease and how this can be directly modulated for disease modification (Harward et al., Nature 2016; Hedrick et al., Nature 2016; Krishnamurthy et al., Ann Neurol 2019). We are particularly interested in developing focused ultrasound as a new method for non-invasively modulating brain activity. Briefly, Focused Ultrasound has recently emerged as a ground-breaking new non-invasive, image-guided therapy to treat Essential Tremor (ET) and Parkinson's Disease (PD). While it is used clinically to make small lesions in the brain circuitry responsible for both ET and PD, additional work has shown that when applied at lower intensity and frequency, it can be used to transiently and focally (with sub-millimeter precision) to open the blood brain barrier, induce local immune responses, and even activate excitatory neurons, inhibitory interneurons, astrocytes, and even microglia. Building on this work, we seek to harness the power of this new tool to optimize its therapeutic use for a wide variety of conditions including epilepsy, neuropsychiatric disease, movement disorders, chronic pain, and brain tumors. To accomplish these goals, we employ a wide range of experimental approaches including viral infections, mouse genetics, *in vitro* and *in vivo* preparations, electrophysiology, calcium imaging, optogenetics, and focused ultrasound.

**Dr. Stephen Harward**, is an assistant professor in Neurosurgery and the Director of Focused Ultrasound Research at the Duke University School of Medicine. His primary clinical and research interest is developing and utilizing novel neuromodulatory tools for neurosurgical applications. He has experience in treating patients with Essential Tremor, Parkinson's Disease, Dystonia, and Epilepsy with a variety of neuromodulatory therapies including Focused Ultrasound.

**How to apply:** Please submit a cover letter describing prior research experience and interests, future research and career goals, and an expected starting date. Additionally, please submit a current CV and names of three references by email to [stephen.harward@duke.edu](mailto:stephen.harward@duke.edu). Evaluation will begin immediately and will continue until the position is filled.

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