Athinoula A. Martinos Center For Biomedical Imaging

MGH/HST Athinoula A. Martinos Center for Biomedical Imaging

MASSACHUSETTS GENERAL HOSPITAL HST Harvard-MIT Health Sciences & Technology

Postdoctoral Research Fellow Position at Massachusetts General Hospital

The Athinoula A. Martinos Center for Biomedical Imaging, Department of Radiology at Massachusetts General Hospital is offering two postdoctoral position based on NIH-funded Brain Initiative projects to develop novel multi-modal neuroimaging methodology in animal models. This position is open now until filled.

Potential candidates will be considered based on the following two research directions:

Research Direction #1 Multi-modal neuroimaging in diseased animal models

a) Implement the MRI/EEG/fiber photometry recording methods to specify brain state fluctuation correlated to pupil dynamics in awake rodents

b) Target specific nuclei with deep brain optogenetic stimulation methods to study circuit-specific brain state neuromodulation

c) Develop an advanced fiber-optic imaging device for MRI compatible concurrent brain dynamic signal recordings, e.g., Ca2+, Glutamate, dopamine, and other neuromodulators.

Experience with multi-photon optical imaging, fiber photometry, or *in vivo* electrophysiology in animal models (rodents) is highly desirable. The candidates should bear experience or strong interests in brain functional imaging, e.g. BOLD fMRI.

Research Direction #2 Advanced fMRI and computational method development

a) Develop and optimize the high spatiotemporal fMRI method, e.g. line-scanning and single-vessel fMRI

b) Advanced resting-state fMRI analysis method development based on the neural network-based learning schemes. (being familiar with recurrent neural network design and implementation, e.g. ESN, GRU)

Candidates with strong computational skills and fMRI data processing experience are highly encouraged to apply for this position.

We welcome candidates with high motivation, curiosity, and scientific maturity. The candidate should have strong teamwork skills and be flexible for night or weekend imaging time shift.

Please send your CV and a cover letter to describe your background, interests and research goals to Dr. Xin Yu by e-mail: xyu9@mgh.harvard.edu. Please include “Postdoc Application for Multi-modal fMRI” in the subject line of your email.

Here is the selected publication lists from Yu lab:

1. Pais-Roldán P, Takahashi K, Chen Y, Zeng H, Jiang Y, **Yu X.** Indexing arousal with multi-modal fMRI merging pupillometry and optical fiber calcium recording, **Proc Natl Acad Sci U S A. 2020,** 117 (12): 6875-6882.
2. Handwerker J, Pérez Rodas M, Vincent F, Freytag N, Beyerlein M, Pohmann R, **Yu X**, Anders J*, Scheffler K* In vivo NMR and fMRI using a needle-shaped NMR-on-a-chip transceiver, **Nature Methods. 2020**;17(1):64-67.
3. Chen X, Sobczak F, Chen Y, Jiang Y, Qian C, Lu Z, Ayata C, Logothetis NK, **Yu X**. Mapping optogenetically-driven single-vessel fMRI with concurrent neuronal calcium recordings in the rat hippocampus. **Nature Communications. 2019**;10(1):5239.
4. Chen Y, Pais-Roldan P, Chen X, Frosz M, **Yu X**. MRI-guided robotic arm drives optogenetic fMRI with concurrent Ca2+ recording. **Nature Communications,2019;**10(1):2536. (highlights for Light-controlled Biology Methods in Nature Communications.)
5. Pais-Roldán P, Edlow BL, Jiang Y, Stelzer J, Zou M **Yu X**, Multimodal assessment of recovery from coma in a rat model of diffuse brainstem tegmentum injury, **NeuroImage,2019;**189:615-630.
6. Wang M, He Y, Sejnowski TJ, **Yu X**. Brain-state dependent astrocytic Ca2+ signals are coupled to both positive and negative BOLD-fMRI signals. **Proc Natl Acad Sci U S A**, **2018**;115(7):E1647-E56.
7. He Y, Wang M, Chen X, Pohmann R, Polimeni JR, Scheffler K, Rosen BR3, Kleinfeld D, **Yu X**. Ultra-slow single vessel BOLD and CBV-based fMRI spatiotemporal dynamics and their correlation with neuronal intracellular calcium signals. **Neuron, 2018**;97(4):925-939 (highlights in Neuron)
8. **Yu X***, He Y, Wang M, Merkle H, Dodd SJ, Silva AC, Koretsky A*. Sensory and optogenetically driven single-vessel fMRI. **Nature Methods, 2016**;13(4):337-340. ***Corresponding author.**
9. **Yu X***, Qian C., Chen D-Y, Dodd S, Koretsky A*. Deciphering laminar-specific neural inputs with line-scanning fMRI. **Nature Methods**, **2014**;11(1): 55-58. ***corresponding authors.**
10. **Yu X**, Chung S, Chen D-Y, Wang S, Dodd S, Walters J, Isaac J and Koretsky A Thalamocortical inputs show post-critical-period plasticity. **Neuron** 74:731-42. (2012)