

## **Postdoctoral Fellow Position in Simultaneous Spinal Cord/Brain fMRI**

### **DESCRIPTION**

The Systems Neuroscience & Pain Laboratory at Stanford University (SNAPL) is actively recruiting a postdoctoral fellow who will join our research project on chronic pain & opioid addiction. Funded by the National Institute of Health and directed by neuroscience professors Sean Mackey and Gary Glover, our goal is to develop safe and effective chronic pain treatments & therapies by investigating corticospinal function via emerging technology known as simultaneous spinal cord/brain fMRI.

Over 100 million Americans have been diagnosed with chronic pain, effectively setting the stage for nation-wide opioid addiction. This chronic pain epidemic, combined with opioid abuse, has been a major healthcare crisis costing over a trillion dollars annually and leading to thousands of American deaths. Ramifications of this public health crisis have been well documented by the Institute of Medicine's 2011 report *Relieving Pain in America: A Blueprint for Transforming Prevention, Care, Education, and Research* (co-authored by co-PI Sean Mackey) and more recently by the 2016 NIH/Health and Human Services National Pain Strategy (co-chaired by Dr Mackey).

Our plan is to utilize pain biomarkers in order to characterize neurobiological mechanisms underlying chronic pain & opioid addiction and, ultimately, to derive new personalized interventions. Given abundant findings that fMRI of the brain can act as biomarker for neuropathic disorders, we propose utilization of our simultaneous spinal cord/brain fMRI to develop biomarkers of pain severity. Our research can be categorized as follows:

1. CNS mechanisms of chronic pain and pain modulation,
2. central sensitization and descending modulation,
3. corticospinal biomarkers of chronic pain conditions,
4. predictive models of pain resilience.

When you join, not only will you have opportunity to collaborate with top neuroscientists and pain specialists at Stanford, but you will also have access to cutting-edge fMRI technology; to invent and develop your own related research. Multidisciplinary aspects of this project will allow you to explore diverse chronic pain topics ranging from biomarker design for degenerative conditions to heart rate variability as a simple biomarker for psychological disorders.

We have a strong track record for successfully transitioning postdoctoral fellows to independent grant funding and faculty positions. We can offer NIH T32 training to select

candidates. The ideal candidate is a motivated problem solver and innovator who has a neuroscience background, enjoys challenging the paradigms of contemporary research and experimentation, is proficient with computer-aided analysis, and is enthusiastic and passionate about fMRI acquisition.

## RESEARCH AREA

- fMRI and behavioral data from Healthy Control and Fibromyalgia,
- Novel analysis techniques for multiecho cardiac-gated fMRI, spinal cord/brain task/resting-state fMRI,
- Experiment design for
  1. temporal summation & central sensitization of pain,
  2. conditioned pain modulation,
  3. descending pain modulation & emotional reappraisal of pain,
- Multivariate pattern analysis of spinal cord/brain data for corticospinal biomarker,
- Simultaneous spinal cord/brain fMRI for multiple sclerosis, spinal cord injury & trauma, motor neuron disease.

## QUALIFICATION

Applicants hold a PhD in a field of Science, Technology, Engineering, Mathematics, or Psychophysics. Experience in Neuroscience study design and data analysis is a must. Additional experience in any of these is a plus:

1. Cognitive / Affective Neuroscience
2. Conditioned Pain Modulation
3. computational modeling / Machine Learning / Neural Networks / ICA
4. chronic pain / opioid addiction / fibromyalgia
5. MATLAB / Python / R / Linux / C
6. SPM / AFNI / FSL / fMRIPrep

## APPLICATION MATERIALS

Submit (1) CV, (2) NIH Biosketch, (3) Letter of Research Intent

Find instructions, blank format pages, and sample biosketches here: [biosketch formats](#). Applicants follow non-fellowship templates. Letter of Intent template is available [here](#).

For more information, visit <http://snap1.stanford.edu>

Please email all materials to Dr. Christine Sze Wan Law: [cslaw@stanford.edu](mailto:cslaw@stanford.edu)