

## **NIH POSTDOCTORAL POSITION AVAILABLE**

### **Neuroimaging**

A postdoctoral position in neuroimaging is available within the Magnetic Resonance Physics of Aging and Dementia (MRPAD) Unit at the National Institute on Aging (NIA) of the National Institutes of Health (NIH), located in Baltimore, Maryland. This is an exceptional opportunity to contribute to a large and unique research initiative in neuroimaging.

As a member of the MRPAD Unit, you will lead cutting-edge research in one or more of the following areas:

1. Advancement of MR Acquisition and Analysis Techniques:
  - Develop and improve MR acquisition methods for quantitative neuroimaging, such as relaxometry, diffusion, cerebral blood reactivity and flow, water exchange, magnetization transfer, susceptibility weighted imaging, quantitative susceptibility imaging, and sodium mapping.
  - Quantify fundamental determinants and properties of the CNS microstructure, composition, and function using quantitative imaging biomarkers.
2. Development of Post-processing Methods:
  - Explore post-processing methods, including compressive sensing, inverse Laplace-based analyses, Bayesian analysis, image denoising, and deep learning.
  - Enhance the analysis and interpretation of neuroimaging data to extract robust information and new insights.
3. Investigation of Imaging Biomarkers:
  - Study the effects of reversible and nonreversible metabolic, functional, vascular, and genetic risk factors on imaging biomarkers of CNS microstructure, composition, and function in normative aging and disease.
  - Understand how changes in these imaging biomarkers impact functional, behavioral, and cognitive impairments.
  - Combine imaging biomarkers with liquid biomarkers to elucidate mechanisms underlying aging physiology and age-related diseases.
4. Integration of MR Physics, PET imaging, and Omics:
  - Bridge the gap between MR physics, PET imaging, and omics, including proteomics, transcriptomics, and metabolomics.
  - Explore interdisciplinary approaches to gain a comprehensive understanding of neuroimaging data in relation to molecular and cellular processes.

The MRPAD Unit focuses on biophysical and physiological studies of the human CNS. Our mission is centered on establishing insightful connections between functional and structural changes associated with normative aging and age-related diseases. We aim to develop accurate pre-symptomatic biomarkers to aid in differential diagnosis, characterize disease progression, and facilitate the development of therapeutics. Our research leverages data from various studies, such as the Baltimore Longitudinal Study on Aging (BLSA), the Genetic and Epigenetic Signatures of Translational Aging Laboratory Testing (GESTALT) cohort, the Coronary Artery Risk

Development in Young Adults (CARDIA) Study, the UK Biobank, and the Alzheimer's Disease Neuroimaging Initiative (ADNI) cohort.

As a leading researcher of our team, you will have access to state-of-the-art imaging equipment, including 3T Philips and 7T Siemens clinical systems capable of proton and heteronuclear imaging. Additionally, we have a 11T Bruker MRI system with microimaging and spectroscopy capabilities, as well as 7T and 11T Bruker systems for preclinical studies involving mice, rats, and monkeys. These instruments are exclusively dedicated to research, ensuring ample scan time availability.

**Qualifications:**

- Hold a Ph.D. in physics, neuroscience, engineering, computer science, mathematics, or a closely related field.
- Possess a strong background in one or more of the following areas: neuroimaging, image analysis, signal processing, statistical analysis, artificial intelligence, or related fields.
- Previous experience with data acquisition on preclinical or clinical MR instruments is a plus.
- Experience with PET imaging data processing is a plus.
- Proficient in a programming language such as MATLAB, Python, R, or C/C++ for data analysis and algorithm development is required.
- Experience in developing machine learning algorithm for quantitative parameter estimation or image qualities enhancement is a plus.
- Familiarity with neuroimaging software packages such as FSL (FMRIB Software Library), SPM (Statistical Parametric Mapping), and/or other commonly used neuroimaging analysis tools is desirable.
- Strong written and verbal communication skills, including the ability to present research findings effectively.
- Demonstrated ability to work independently as well as collaboratively in a multidisciplinary research environment.
- A publication record demonstrating research productivity and the ability to contribute to scientific literature.

Successful candidates will be appointed as an IRTA Postdoctoral Fellow for US citizens or as a Visiting Fellow for non-citizens. The initial appointment guarantees a stipend for two years, including family health insurance coverage, with the possibility of annual renewal upon mutual agreement, up to a maximum of five years.

To apply, interested individuals should email their CV to both Dr. Mustapha Bouhrara, Chief of the MRPAD Unit at [bouhraram@mail.nih.gov](mailto:bouhraram@mail.nih.gov), and Dr. Zhaoyuan Gong, Senior Scientist of the MRPAD Unit at [zhaoyuan.gong@nih.gov](mailto:zhaoyuan.gong@nih.gov).

**The NIH is an equal opportunity employer, and applicants from all backgrounds, including minorities and women, are strongly encouraged to apply.**