Harvard T.H. Chan School of Public Health

Department of Environmental Health and Department of Molecular Metabolism

Postdoctoral Research Fellow

Exposomics & Metabolomics in Lung Disease Etiology

The Gao Lab at Harvard T.H. Chan School of Public Health is seeking an outstanding postdoctoral research fellow to develop and apply **high-resolution mass spectrometry (HRMS)-based exposomics and metabolomics** to uncover environmental and molecular determinants of **complex lung disease etiology** (e.g., lung cancer, asthma, and other environmentally influenced respiratory outcomes). Our lab integrates cutting-edge analytical chemistry, exposure science, and data science to advance precision environmental health and mechanistic understanding of environmentally induced lung diseases.

Research Focus and Opportunities

The successful candidate will lead and contribute to projects that leverage **LC/GC-HRMS exposomics and metabolomics** in human biospecimens and/or environmental samples, with emphasis on identifying exposures, metabolic signatures, and pathways linked to lung disease risk and progression. The position offers opportunities to work with rich epidemiologic and clinical resources and to publish in high-impact journals in environmental health, omics, and pulmonary medicine.

Potential project directions include, but are not limited to:

- Untargeted and targeted chemical exposomics in longitudinal/prospective cohorts to discover risk/protective factors for lung disease
- Integrated exposomics–metabolomics analyses to identify biologic pathways and biomarkers relevant to lung disease etiology
- Methods development for HRMS data processing, chemical annotation/identification, and exposome-wide association studies
- Multi-omics and exposure mixture modeling; reproducible workflows and open, scalable analysis pipelines

Responsibilities

- Perform and/or oversee HRMS-based data generation (LC/GC-HRMS and targeted validation as appropriate) and quality control
- Conduct computational analysis of HRMS datasets, including non-targeted feature processing, annotation, and statistical modeling
- Integrate multi-omics results with epidemiologic/clinical data; contribute to manuscripts, conference presentations, and grant-related activities
- Collaborate with interdisciplinary teams across environmental health, biostatistics, epidemiology, and pulmonary research communities

Required Qualifications

- Ph.D. (or equivalent doctoral degree) in analytical chemistry, environmental health, epidemiology, bioinformatics/biostatistics, cheminformatics, or a related field
- Demonstrated experience with the analysis of HRMS datasets

- Programming skills in R and/or Python
- Hands-on experience with LC/GC-HRMS operation and/or method development
- Excellent written and verbal communication skills and ability to work independently and collaboratively

Preferred Qualifications

- Experience analyzing large-scale omics datasets and integrating multi-omics or exposure data with clinical/epidemiologic outcomes
- Familiarity with exposure science, toxicology, and/or respiratory disease research

Appointment, Compensation, and Benefits

This position is supported by an NIH T32 training grant. Per NIH policy, appointment is **limited to U.S. citizens, U.S. non-citizen nationals, or U.S. permanent residents at the time of appointment**.

This is a full-time postdoctoral position with an initial appointment of one year, with the annual renewal based on performance and funding availability. Salary and benefits are competitive and aligned with institutional and NIH/NRSA guidelines.

How to Apply

Please email the following to Dr. Peng Gao at pgao@hsph.harvard.edu:

1. Cover letter describing research interests and fit for HRMS-based exposomics/metabolomics in lung disease;
2. Curriculum vitae;
3. Contact information for three references.

Review of applications will begin immediately and continue until the position is filled.

Contact

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