



EMORY

ROLLINS
SCHOOL OF
PUBLIC
HEALTH



Postdoctoral Fellow in Computational Exposomics

Employment Type: Full time, 1 year with the possibility to extend, start Winter/Spring 2023

The Comprehensive Laboratory for Untargeted Exposome Science (CLUES) in the Gangarosa Department of Environmental Health at Emory University seeks talented postdoctoral applicants with expertise in **biostatistics, epidemiology, environmental health, data science and/or systems biology** to join a growing research group that leverages state-of-the-art mass spectrometry platforms to measure the human exposome. These efforts have enabled new methods for significantly advancing the ability to characterize how exposures contribute to disease, and now provide a precision environmental health framework for studying the intersection of environment, biology and disease at the population level. We are an internationally recognized laboratory in the emerging field of exposome research and provide ample opportunities for training in cutting edge high-resolution mass spectrometry methods that explore exciting research questions at the interface of environment, multi-omics and human health. The ideal candidate will have experience coding in R or Python, and be willing to apply data science approaches for solutions in computational mass spectrometry, metabolism, and exposome-wide association studies (EWAS) in support of ongoing research projects. Areas of study include environmental determinants of non-communicable diseases (cancer and other metabolic diseases), measuring complex exposures of emerging concern, including microplastics, PFAS, and e-waste, and establishing OMIC-based strategies for universal chemical surveillance and bioeffect monitoring. The facility currently houses two LC-HRMS (Thermo Exploris 120 Orbitraps) and three GC-HRMS (2 Thermo GC Q-Exactive and 1 Thermo GC-Exploris Orbitraps) and has plans to strengthen its technology base further. The exposome provides a new paradigm for understanding how complex exposures drive adverse health outcomes, and candidates will have the opportunity to be at the forefront of technological and data science methods for this emerging field of research.

Responsibilities may include:

- Coding and data manipulation in R, Python or equivalent languages
- Optimization and management of bioinformatic workflows for data extraction, processing and annotation of untargeted mass spectrometry data.
- Apply variable selection techniques based upon univariate and multivariate approaches.
- Develop and apply exposomic data analytic approaches to maximize detection of exposome biomarkers.
- Perform EWAS for disease and adverse health outcomes
- Metabolic pathway and chemical set enrichment analysis.
- Database development for creating a cumulative resource of untargeted exposome studies.
- Provide summaries and interpretation of untargeted exposome data.
- Preparation of manuscripts for submission to peer-reviewed journals.

Knowledge/Skills:

The ideal candidate for the postdoctoral fellow must have a PhD in metabolomics, epidemiology, engineering, biostatistics, data science, bioinformatics or other environmental health related fields. Previous experience with big data analysis or omics is preferred. Candidates will have hands-on

experience working with exposome studies and have the opportunity to learn fundamentals of untargeted mass spectrometry data acquisition and analysis, pre-processing workflows, EWAS and characterization and interpretation of results. Experience with R or an equivalent programming language is required. They must also have strong organizational and time management skills, with the ability to independently meet project timelines. While preference will be given to scientists with the expertise summarized above, we are willing to train exceptionally motivated individuals with strong analytical and communication skills.

Our laboratory is located within the Rollins School of Public Health at Emory University. The Rollins School of Public Health is ranked 5th among public health graduate schools by U.S. News & World Report and ranked number 5 in the Blue Ridge Report amongst schools of public health receiving NIH support. The Gangarosa Department of Environmental Health houses researchers with interests spanning Environmental Health, including mechanistic and computational toxicology, genomics, the developmental origins of disease, air pollution, climate change, water, sanitation and hygiene, and environmental epidemiology. Within the department is Emory's HERCULES Health and Exposome Research Center, an NIEHS P30 Environmental Health Support Center and the first Exposome Research Center in the US that includes a pilot grant program to which fellows are eligible to apply. Additional formal mentoring and development programs are also available through an NIEHS funded T32 training grant. The team science approach in this department provides opportunities to co-author publications with leading collaborators. We offer numerous opportunities for career advancement, including support for grant applications funding career independence, ability to attend workshops on topics related to the exposome and data science, and travel to national and international conferences. Work-related experience will be considered in determining level and salary. The postdoctoral fellow will be encouraged to develop new ideas that promote current research and will prepare and publish scientific manuscripts under the direction of Dr. Walker. Opportunities to apply for independent funding will be available and encouraged. The initial appointment is for one year, with expected renewal if progress is satisfactory and funds are available.

Application process:

Interested candidates should email a cover letter including a summary of research interests and experience, as well as their curriculum vitae, to Dr. Douglas Walker (douglas.walker@emory.edu).