

HEAL Service Center

About the HEAL Service Center The HEAL Service Center in the College of Health (<https://health.lehigh.edu/research-partnerships/research-centers-and-institutes/HEAL/>) at Lehigh University provides accessible, state-of-the-art mass spectrometry and analytical support to faculty, academic partners, and industry. From environmental contaminant screening to deep proteomics, the center is dedicated to advancing public health through collaborative, high-resolution science.

Lehigh University's College of Health is proud to announce the official launch of the Health and Environmental Assessment Laboratory (HEAL) Service Center. Situated in the state-of-the-art Health, Science, and Technology (HST) building, this university shared core facility is designed to be a powerhouse of molecular analysis, providing real-world solutions at the complex intersection of environment and human health.

Occupying a part of the massive 36,000-square-foot collaborative laboratory space, the HEAL Service Center offers an open-concept environment where innovation thrives. As a premier service center for the greater Lehigh Valley and beyond, the facility provides internal and external partners with long-term, reliable access to high-value instrumentation—a Thermo Fisher Vanquish LC coupled to a Q Exactive Orbitrap Mass Spectrometer—without the burden of independent equipment management.

At the heart of the center's mission is its professional staff, including a research scientist PhD-level expert who provides dedicated operational support. This small team does more than just operate machinery; they serve as true collaborators who assist at every stage of the research pipeline. This includes:

- Sample preparation and method development.
- Complex data analysis and interpretation for large-scale omics studies.
- Custom method development for novel analytes and emerging contaminants.
- Preliminary data generation to support sponsored research funding proposals.
- Workflow development and optimization for new research programs.
- Hands-on student training in mass spectrometry techniques.
- End-to-end project support, from design through sample analysis, reporting and publication.

A Hub for Student Mentoring, Equipment Use

For prospective faculty, the HEAL Service Center acts as a vital resource to strengthen research capacity and help faculty members compete for major grants. For prospective students, the lab offers a unique environment for student mentoring and hands-on training. Students work alongside professional staff to master advanced mass spectrometry techniques, gaining real-world experience in detecting everything from metabolites to thousands of proteins from a single sample. Beyond student training, the HEAL Service Center serves as a strategic asset for faculty seeking external funding. Center staff can assist investigators with experimental design, preliminary data generation, and analytical method documentation, providing the scientific foundation that strengthens grant applications.

Serving Regional and Industry Partners

The center is strategically located just one hour from both Philadelphia and New York City, making it a convenient destination for external customers and industry partners who need to process biological or environmental samples quickly without the logistics of long-distance shipping. Whether it is a small-scale quantification project or a discovery-driven untargeted metabolomics study, the HEAL Service Center provides the precise data necessary to link environmental exposures to molecular-level changes in the body. By centralizing and making this resource available, we are empowering investigators from various disciplines to achieve their scientific goals while training the next generation of health researchers.

The HEAL Service Center is equipped to analyze a broad range of chemical contaminants and biological molecules across various environmental and human health matrices, including water, wastewater, runoff, soil, dust, airborne particulate samples, and biological specimens such as plasma, urine, and tissue. The facility offers detection sensitivity down to trace levels for both targeted and untargeted screenings across environmental, metabolomic, and proteomic applications.

Specific areas of analysis include:

- **Environmental contaminants:** Pesticides, herbicides, industrial chemicals, PFAS (per- and polyfluoroalkyl substances), other persistent organic pollutants, antibiotics, drug residues, and personal care product ingredients detected across diverse environmental sampling matrices.
- **Metabolomics:** Untargeted and targeted small-molecule profiling to capture the full spectrum of metabolites present in biological or environmental samples, revealing how environmental exposures alter biochemical pathways in the human body.
- **Proteomics:** Deep, large-scale protein identification and quantification from complex biological samples, enabling researchers to characterize how environmental stressors drive changes in protein expression and cellular function.

The center's high-resolution instrumentation, a Thermo Fisher Vanquish LC coupled to a Q Exactive Orbitrap Mass Spectrometer, is purpose-built for this breadth of analysis. Researchers can pursue targeted quantification of known compounds or conduct discovery-driven untargeted screening to identify unexpected chemicals, metabolites, or proteins, ultimately linking environmental exposures to measurable, molecular-level changes in human health.