

How to Apply

The Certificate Program in Environmental Health Sciences (EHS) is a full-time training program offered by the Office of Biomedical Graduate Studies (BGS). Students who apply for any BGS PhD program are eligible to apply to the program.

Matriculants receive a fully-funded fellowship—including tuition, fees, health insurance, and a competitive stipend—regardless of financial need. The training and research base for the Certificate Program in Environmental Health Sciences is the Center of Excellence in Environmental Toxicology (CEET) which is supported by the National Institute of Environmental Health Sciences (NIEHS) P30-ES013508.


Curriculum

Students take specialized courses in addition to their graduate group requirements and receive a PhD from their graduate group and a Certificate in Environmental Health Sciences. Course work covers molecular toxicology, epidemiology, biostatistics, genome science and biomedical informatics. All students must complete three laboratory rotations, one of which must be a community or population-based research project. Students are expected to attend the CEET seminar series and present at the annual CEET symposium. Completion of this sequence is sufficient to graduate with the Certificate. Thereafter, students conduct their thesis research (typically three years) to graduate with the PhD degree.

Training Grant Support

Graduate students who complete one year of the Certificate Program and elect to conduct thesis research in the area of environmental health sciences, are eligible for additional support from an institutional training grant (T32): "Translational Research Training Program in Environmental Health Sciences" (1T32-ES019851).

<http://ceet.upenn.edu>



CERTIFICATE PROGRAM IN ENVIRONMENTAL HEALTH SCIENCES

UNIVERSITY OF PENNSYLVANIA

For more information

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Office of Biomedical Graduate Studies

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Certificate Program in Environmental Health Sciences (EHS)

This program will prepare graduate students for professional careers in environmental health sciences.

THEMATIC AREA: Air pollution and lung health



THEMATIC AREA: Environmental exposures and cancer



The Certificate Program in Environmental Health Sciences (EHS) focuses on the mechanistic links that exist between environmental exposures, the molecular and cellular affects that ensue, and diseases of environmental etiology. Emphasis is placed on training in molecular toxicology, environmental and occupational health, molecular epidemiology, toxicogenomics, toxicoproetomics, and population-based and clinical/translational research. The goal is to explore mechanisms, pathogenesis, prevention and treatment of diseases of environmental etiology. This is achieved by working with world-renowned experts in one of four thematic areas: air pollution and lung health, environmental exposures and cancer, windows of susceptibility, and environmental neuroscience. Each thematic area is underpinned by four pillars; exposure assessment; adverse outcome at the molecular and cellular level that can account for phenotype; translation to patient-oriented research and translation to communities, policymakers and health care professionals.

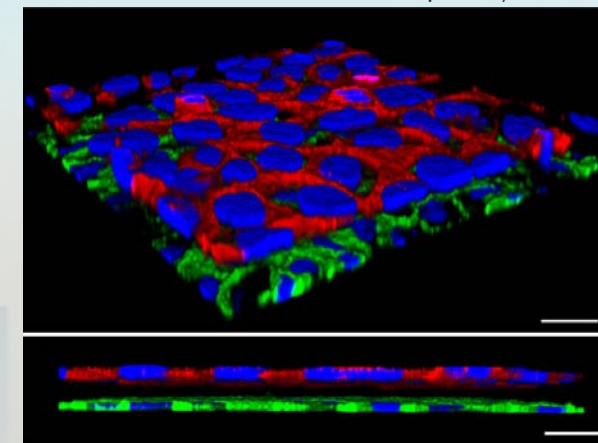
Our scientists also investigate gene-environment interactions to identify individuals most susceptible to environmental exposures and disease based on genotype and epigenotype. They develop and validate biomarkers of exposure and response to determine phenotype and also use targeted and untargeted metabolomic approaches. The goal is to achieve precision public health to determine who is at risk and who will respond to treatment. Course work and rotations will equip students to perform research across disciplines. Options exist to do risk assessment and risk communication in environmentally-challenged communities in Southeastern Pennsylvania.

Graduates of the program will be prepared for careers in toxicology, risk-assessment, and environmental and occupational health sciences and may place in academia, the pharmaceutical industry, consumer-product industry, or governmental agencies (e.g. EPA, CDC, FDA, NIEHS, NHLBI, NCI and NIOSH). Trainees will receive broad training in these areas for careers in EHS and will be encouraged to become board certified as "Diplomats of the American Board of Toxicology."

Many common diseases/disorders are "linked" to environmental exposures that are studied in the thematic areas. These include ozone, e-cigarettes,

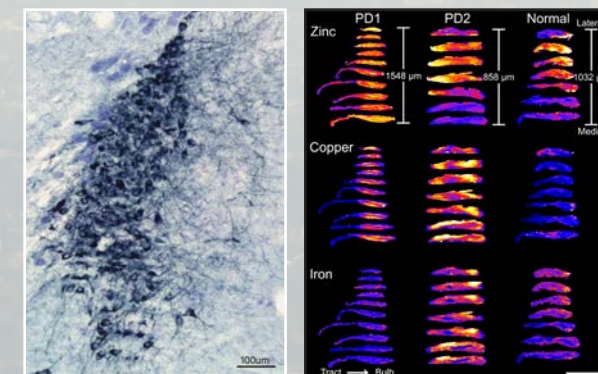
and particulates and lung heath, in the cancer domain emphasis is on asbestos and mesothelioma, air pollution and lung cancer, second-hand smoke and vaping, and UV-light and skin cancer. In utero exposures and transgenerational effects are studied with an emphasis on endocrine-disrupting chemicals in the windows of susceptibility thematic area. In the environmental neuroscience domain, studies on lead poisoning, exposures correlated with autism spectrum disorders and sleep disturbance are evaluated.

THEMATIC AREA: Windows of susceptibility



Placenta-on-a-chip: A three-dimensional rendering of the microengineered placental barrier.¹

THEMATIC AREA: Environmental neuroscience



Reduced neuron estimates for locus coeruleus (LC) and orexinergic neurons in chronic sleep disturbance.²

Heat maps of zinc, copper, and iron concentrations in serial saggital sections of olfactory bulbs and tracts in Parkinson's Disease patients.³

¹ Blundell C, et al (2016) *Lab Chip* 16(16):3065-3073

² Zhu Y, et al (2015) *Front Neurol* 6:109

³ Gardner B, et al (2017) *Sci Rep* 7(1):10454