

Certificate Program in Environmental Health Sciences (EHS)

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

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 lung and airway disease, cancer causation, neurodegenerative disease, reproductive and developmental disorders, and cardiovascular disease.

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 environmental medicine 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.

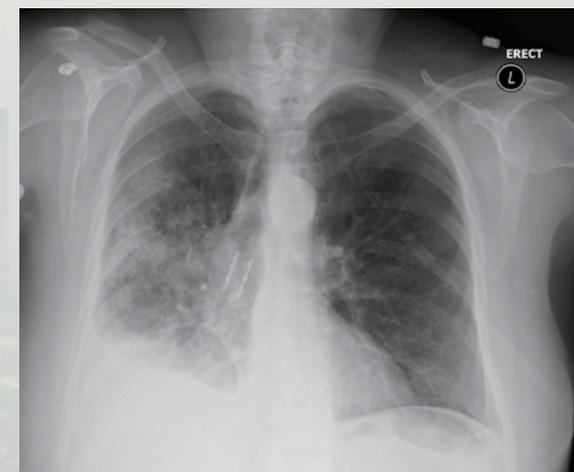
Graduates of the program will be prepared for careers in toxicology, risk-assessment, and environmental and occupational health sciences and may place in academia, the pharmaceutical industry, consumer-product industry, or governmental agencies (e.g. EPA, CDC, FDA, NIEHS, NHLBI, NCI and NIOSH). Trainees 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. Areas of interest include: lung and airway disease (asthma, lung cancer, mesothelioma and chronic obstructive pulmonary disease) that can result from exposure to allergens, ozone, inhaled carcinogens, asbestos and air pollutants;

diseases linked to oxidative stress (neurodegenerative disease, cardiovascular disease and inflammation). In addition, environmental exposures at windows of susceptibility can lead to reproductive, endocrine, and developmental disorders and determine the onset of adult disease. Elucidating the mechanistic links that exist between exposure and disease will lead to improved prevention and intervention strategies of major societal disease.



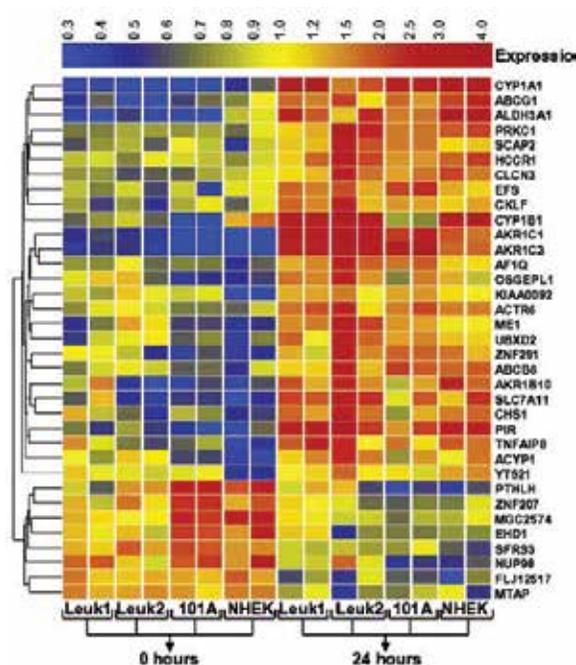
p53 tumor suppressor gene bound to DNA



Human lung with adenocarcinoma



Asthmatic person on inhaler



Gene expression and cigarette smoke



Detection of environmental mutagens