

Center for Environmental Health Sciences

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Director

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Mission/Vision

- Mission: To investigate the effects of environmentally relevant chemicals on health; current emphasis is biomedical and goals are obtaining NIH and other biomedical funding sources.
- Vision: To become nationally competitive in environmental health research and training.

Faculty Participants

- CVM
 - Basic Sciences (Ainsworth, Carr, J. Chambers, Crow, Eells, Filipov, Givaruangsawat, Pruett, Ross)
 - Pathobiology and Population Medicine (Wills)
- CALS/MAFES
 - Entomology and Plant Pathology (H. Chambers)
- A&S
 - Chemistry (Gwaltney)
 - Mathematics and Statistics (Oppenheimer)

Participants

- 13 faculty
- 13 staff
- 3 post-docs
- 13 graduate students
- 2 undergraduate students

Current Research Funding

- National Institutes of Health (National Center for Research Resources; National Institute of Environmental Health Sciences; 1 P20, 2 R01's, 1 R21, 1 R15, 1 R03)
- Department of Defense (2 Defense Threat Reduction Agency)
- US Environmental Protection Agency (STAR grant)
- Annual: about \$1.5-2 million
- Total of above grants: \$13 million

NIH P20: Center of Biomedical Research Excellence (COBRE)

- Building infrastructure to grow a biomedical research program competitive for NIH funding.
- Theme: pesticide toxicology; human health.
- 5 projects: cardiovascular; metabolism; neurotoxicity (development and neurodegeneration); mathematical modeling.
- 3 cores: Administrative; Bioanalytical Chemistry; Molecular Biology/Microscopy.
- Junior faculty.
- An Institutional Development Award (IDeA).

COBRE--Renovation



NIH R21: Pesticides and CV Disease

- Investigate the role of pesticide exposure as a risk factor in cardiovascular disease (health disparities) in humans.
- Polymorphisms of PON (HDL) related to race and cardiovascular health/disease.
- Development of better diagnostic tests.
- Levels of current and past pesticide exposure through analytical chemistry and mathematical models.

EPA STAR: Pesticide mixtures

- Develop computational models to predict one's previous exposure levels to pesticides from current pesticide/metabolite levels in blood and urine (biomarkers).
- Collaboration with Colorado State University.
- MSU portion is treatment of rats with mixtures of two organophosphate insecticides.

DoD DTRA: Antidote development.

- Synthesis of novel oximes with greater ability to cross the blood-brain barrier.
- Oximes are standard antidotes for nerve agent poisoning; current oximes cannot enter the brain.
- Testing of novel oximes in rats with nerve agent surrogates to determine prevention of seizures and attenuation of brain damage.

Areas of Opportunities for Collaboration

- Human health metrics.
- Computational/mathematical modeling.
- Molecular mechanisms of toxicity.
- Analytical detection techniques for chemicals.
- Eligible for NIH IDeA program.
- Ample justification for health disparity research.
- Applications to military personnel defense and counter chemical terrorism.

Challenges

- Low critical mass of biomedically-oriented faculty at MSU.
- Restricted budget availability for competitive grants from federal agencies.
- Perceptions and biases of NIH reviewers.
- Difficulty in competing with large established programs in medical schools.

Other

- Participate in all 5 regulatory compliance areas (human subjects, animals, biosafety, radioactive chemicals, hazardous chemical waste).
- Have relied strictly on competitive federal grants; overall history of \$20 million in competitive grants.