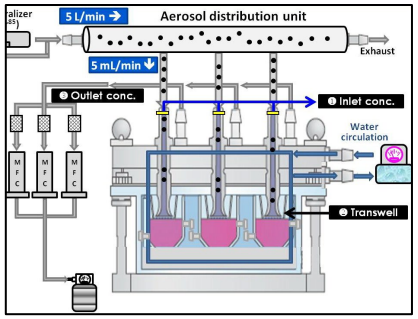


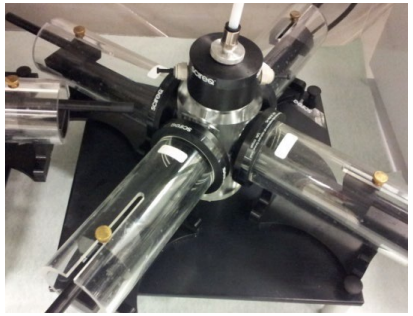
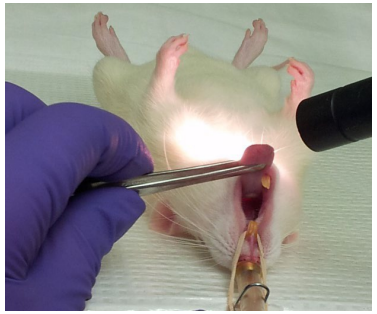
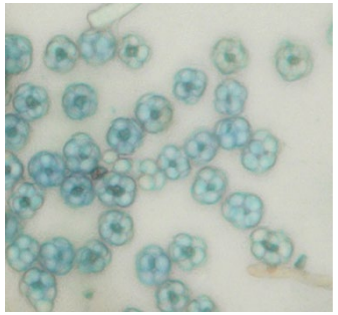
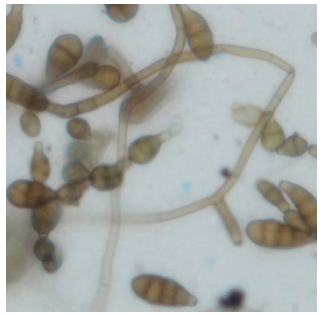
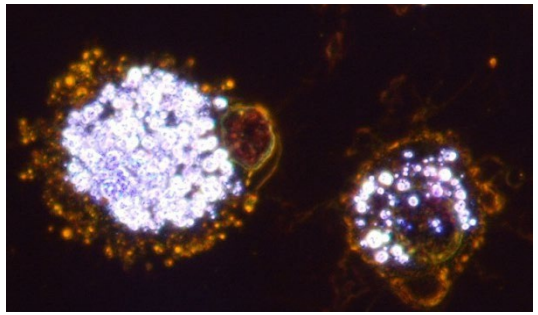
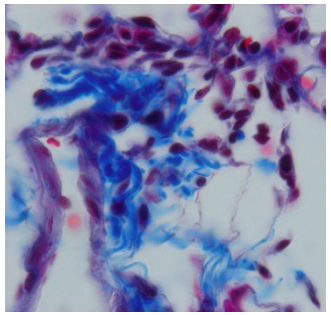

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Pulmonary Toxicology Facility

Pulmonary Toxicology Facility

Peter Thorne, PhD, Director

Andrea Adamcakova- Dodd, PhD, Assistant Research Scientist

Nervana Metwali, PhD, Research Manager

Xuefang Jing, PhD, Research Specialist

Jong Sung Kim, Assoc. Prof. **Patrick O 'Shaughnessy, Prof**

PTF Major Activities 2024

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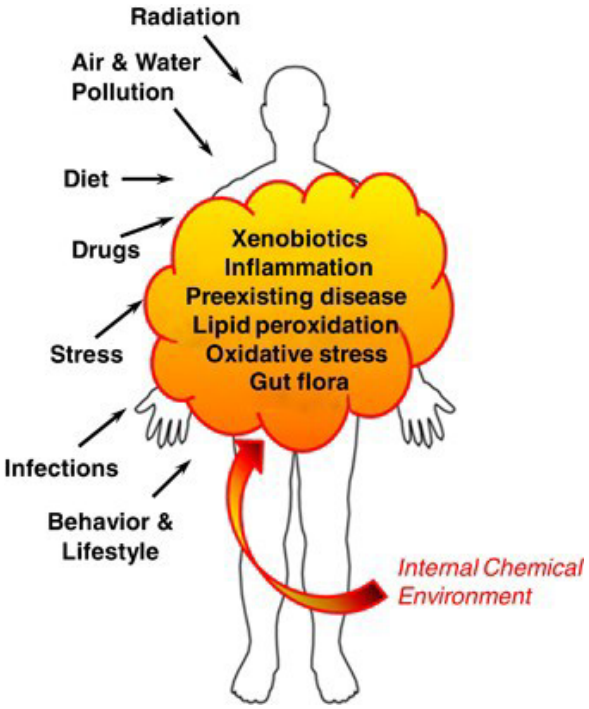
Two major categories of activities

- Pulmonary Toxicology
  - Inhalation Studies
  - Instillation Studies
  - In vitro Air Liquid Interface Studies

- Environmental Epidemiology
  - Exposure assessment of xenobiotics
  - Assessment of biomarkers of response
  - Consultation on study design and analysis of exposure data



Inhalation toxicology research
Hypothesis driven

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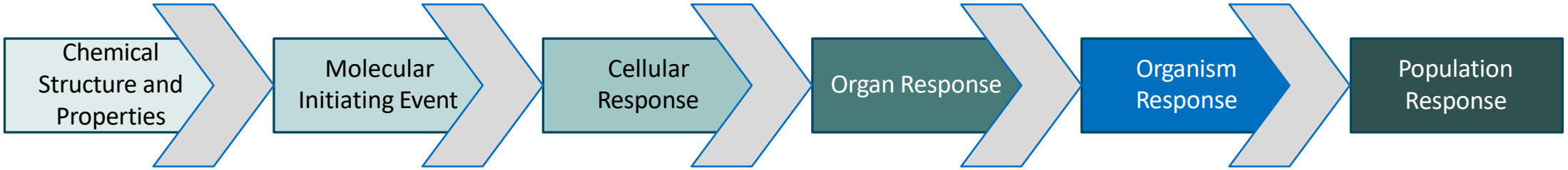
- Elucidate an adverse outcome pathway



- Determine the array of adverse outcomes and the most sensitive biomarkers
- Characterize absorption, distribution, metabolism, and excretion (ADME)
- Gather data and perform toxicokinetic (PK/PD) modeling
- Classify xenobiotics or complex mixtures as to their relative toxicity
- Develop therapeutic measures – prophylactic, rescue, or recovery

PTF Major Activities 2024

Inhalation Toxicology Studies

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- The role of extracellular vesicles in pulmonary inflammation - R21 ES035983, PI Adamcakova-Dodd
- Addressing rural environmental health in a changing climate: Identifying conserved targets for intervention to address climate change-mediated health effects – OVPR, PI Lehmler
- Iowa Superfund Research Program - NIH P42 ES013661, PI Hornbuckle
  - PCB inhalation studies - SAM, PCB 52 - Thorne
  - PK/PD study of ^{14}C-labeled PCB 11, 28, and 52 - Thorne
  - PCB 52 neurotoxicology study - Lehmler
  - PCB 52 obesity study - Klingelhutz
- CounterACT - Cationic CAMKIIN nanoparticles that reduce chlorine-induced airway oxidative stress R21 ES032937, PI Salem
  - Chemical threat agent exposures – Cl_2, PH_3
  - CAMKII activation and Cationic CAMKIIN nanoparticles to reduce airway oxidative stress
  - Ubiquinol and ocular toxicity

PTF Major Activities 2024

Inhalation Toxicology Studies

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- Inhalation Risks of Aged Airborne Micro- and Nanoplastics Combined with Heavy Metals or PCBs: Mechanisms and Impacts – R01/R21 applications – Kim, Adamcakova-Dodd, O'Shaughnessy, Thorne
- Evaluation of the role of Akt activity in cell fate decisions during asthma. - R01 application - PI Ryan
- Biological response profiles of selected engineered nanomaterials after perinatal exposure – NIH U01 ES027252, PI Thorne
  - CdS and ZnS perinatal studies
  - Sub-acute studies of 4 metal oxide nanomaterials
- Delivery of CRISPR Ribonucleoproteins to Airway Epithelia using Novel Amphiphilic Peptides - NIH UH3 HL147366, PI McCray
  - Aerosol delivery – in vitro, in vivo
- Pesticide exposures – neonicotinoids as seed coatings – Thompson (CHEEC)

PTF Major Activities 2024

Environmental Epidemiology Studies

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- Exposure assessment for epidemiology studies
  - State of the art assays developed or optimized by the PTF
  - Endotoxin, glucans, allergens, peptidoglycans, gravimetric concentration
  - Cyanobacterial toxins
    - Microcystins, saxitoxins, anatoxins, cylindrospermopsins
  - Extreme degrees of QA/QC
- Exposomics and biomarkers
  - Total and specific antibodies to environmental allergens
  - Cytokines/chemokines
  - Hormones
  - Blood Pb, As, Mn, Se. + others
  - PCBs, OH-PCBs, PCB sulfates
  - Metabolomics, proteomics, genomics
- Exposures to disasters and wildfires

PTF Major Activities 2024

Environmental Epidemiology Studies

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- AESOP - Airborne exposures to semi-volatile organic pollutants, ISRP Project 3 - NIH P42 ES013661, PI Thorne
- AeroBPD - Indoor air quality and respiratory morbidity in school-aged children with bronchopulmonary dysplasia - NIH R01 ES030100 – PI Gaffin
- PARK - Controlling and preventing asthma progression and severity in kids - NIH U01 AI126614-03 , PI Phipatanakul
- EASY - Environmental risk factors for pediatric sleep disordered breathing - NIH R01 HL137192, PI Redline
- IDEA - Effect of IL-4RR576 variant on response to Dupilumab in children with Asthma - NIH U01 AI1143514, PI Phipatanakul
- SICAS 3 - Novel NOTCH4 Pathway of Asthma Severity in Urban School Children - NIH U01 AI160087, PI Phipatanakul
- CC&H - Adverse health effects associated with climate disasters among veterans – VA - CADRE, 36C26321C0072, C0076, PIs Thorne, Kaboli

Questions?