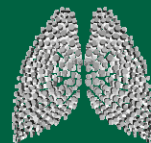


UAB THE UNIVERSITY OF
ALABAMA AT BIRMINGHAM.



UAB Superfund Research Center
Impact of Airborne Heavy Metals on Lung Disease and the Environment

<https://www.uab.edu/medicine/src/>

Impact of Airborne Heavy Metals on Lung Disease and the Environment

Veena Antony, M.D.

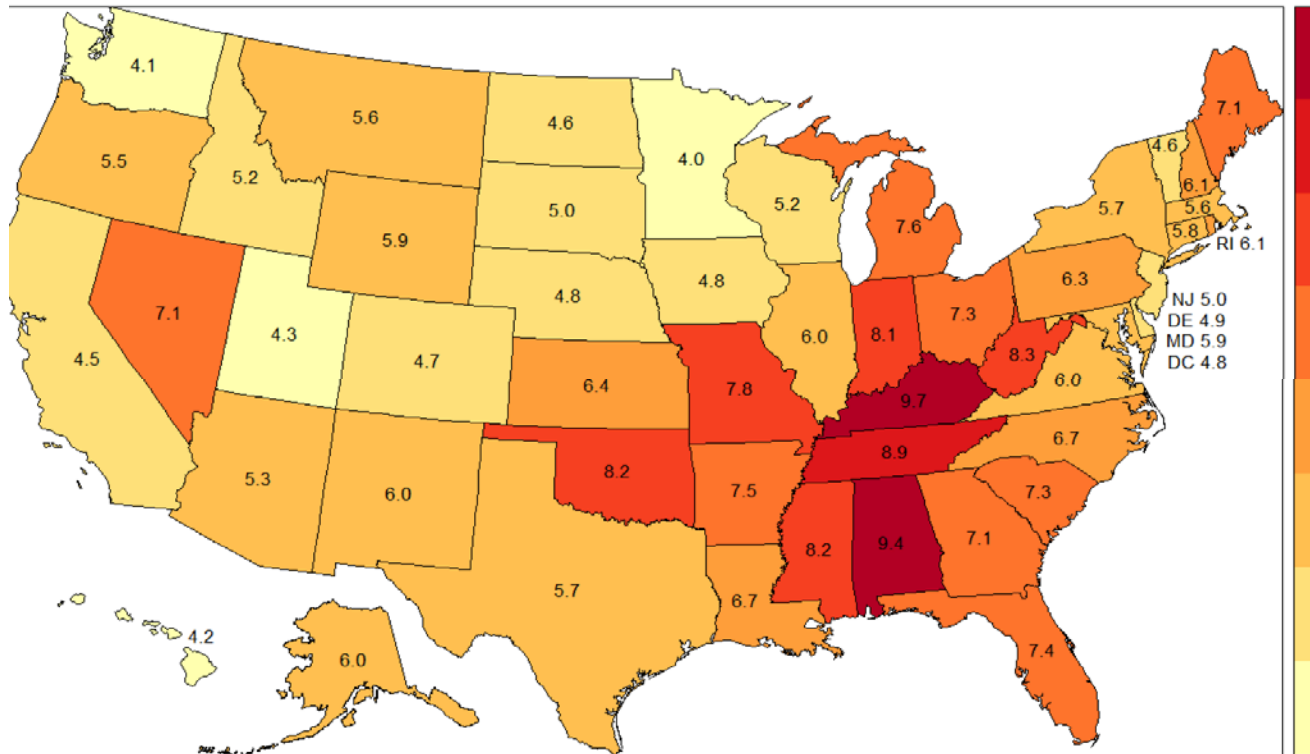
Endowed Professor of Environmental Medicine

Department of Medicine

Pulmonary and Critical Care

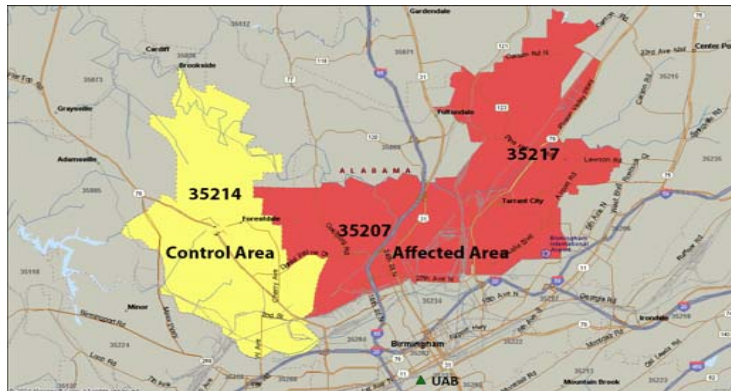
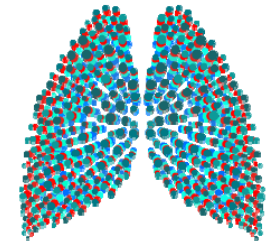
University of Alabama at Birmingham

Chronic Obstructive Lung Disease in the US and Alabama



Birmingham, Alabama was founded on the discovery of iron, coal and limestone in the same mountain

**UAB Superfund
Research Center**



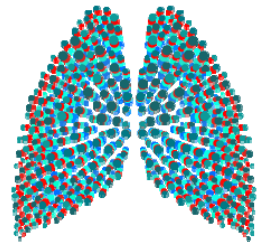
LUNG DISEASE IS HIGHLY PREVALENT

The **Affected Area (defined by EPA)** has twice the prevalence of lung disease than Control Areas such as COPD, Asthma, pneumonias, bronchiectasis, lung fibrosis etc.

Significant numbers of children in K-8th grade have physician diagnosed Asthma

Demographics

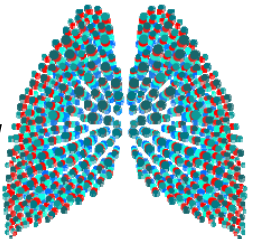
**UAB Superfund
Research Center**



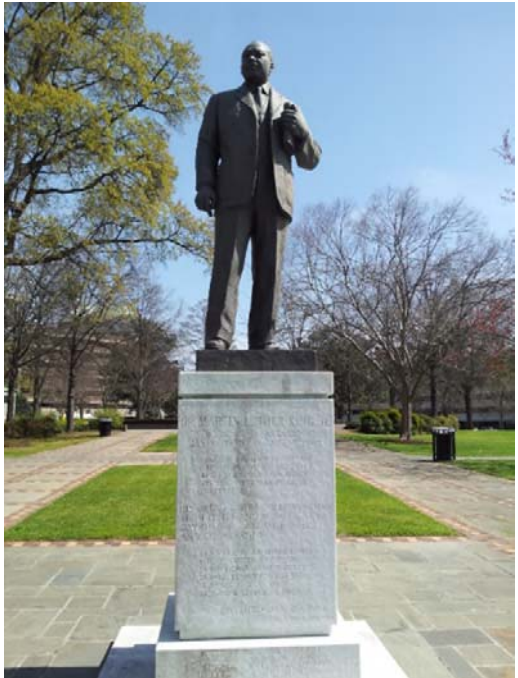
Zip Code	35207/35217	35214/
Ethnicity/Percent African American	92.5%	90.80%
Prevalence of Smoking	21%	22%
Socioeconomic status/ mean income	24,028	29,623
Prevalence of COPD	9.86%	4.24%

Letter from Birmingham Jail: Dr Martin Luther King

UAB Superfund
Research Center



Of all the forms of inequality, injustice in health is the most shocking and inhumane.....



Statues in Kelley Ingram Park, Downtown Birmingham

Jefferson County: Racial and Ethnic Distribution

Jefferson County Racial and Ethnic Distribution by Census Tract (2010)

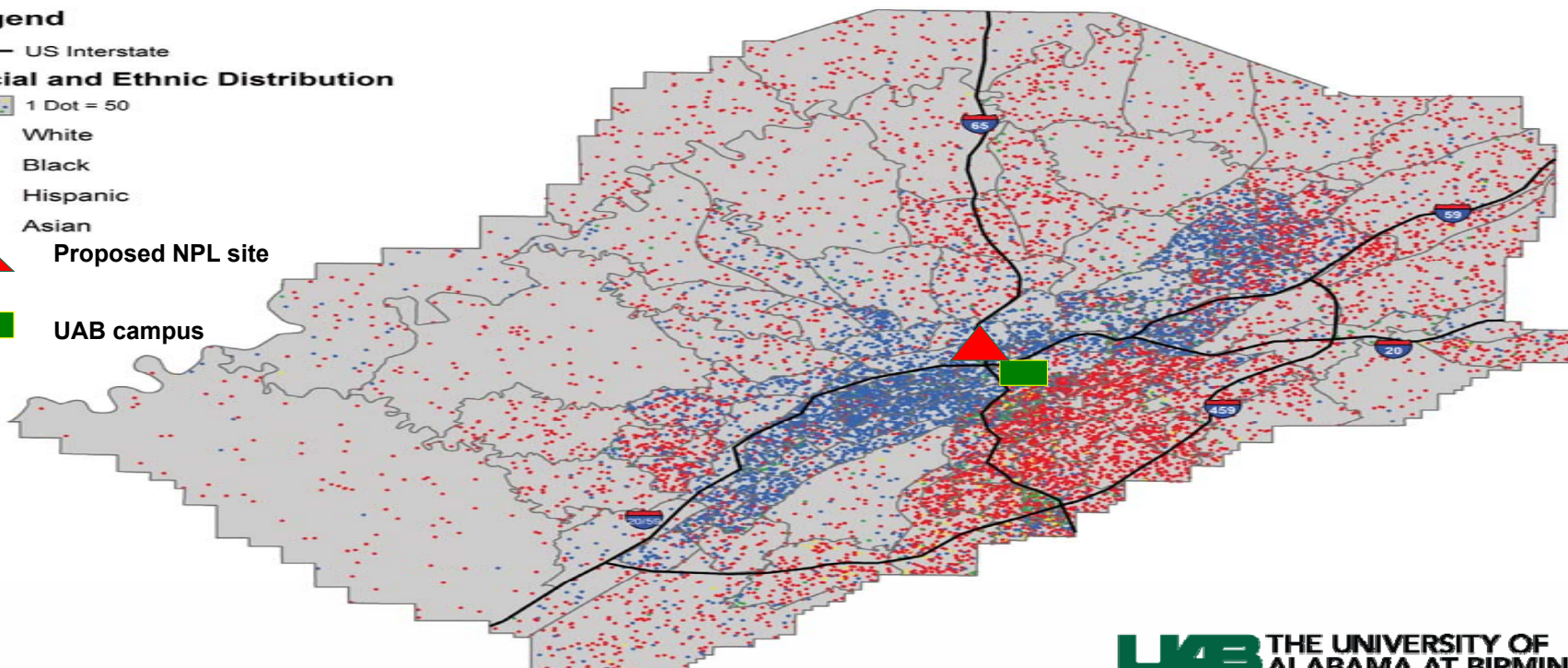
Legend

— US Interstate

Racial and Ethnic Distribution

1 Dot = 50

- White
- Black
- Hispanic
- Asian
- ▲ Proposed NPL site
- UAB campus



0 5 10 20 Miles

Life Expectancy

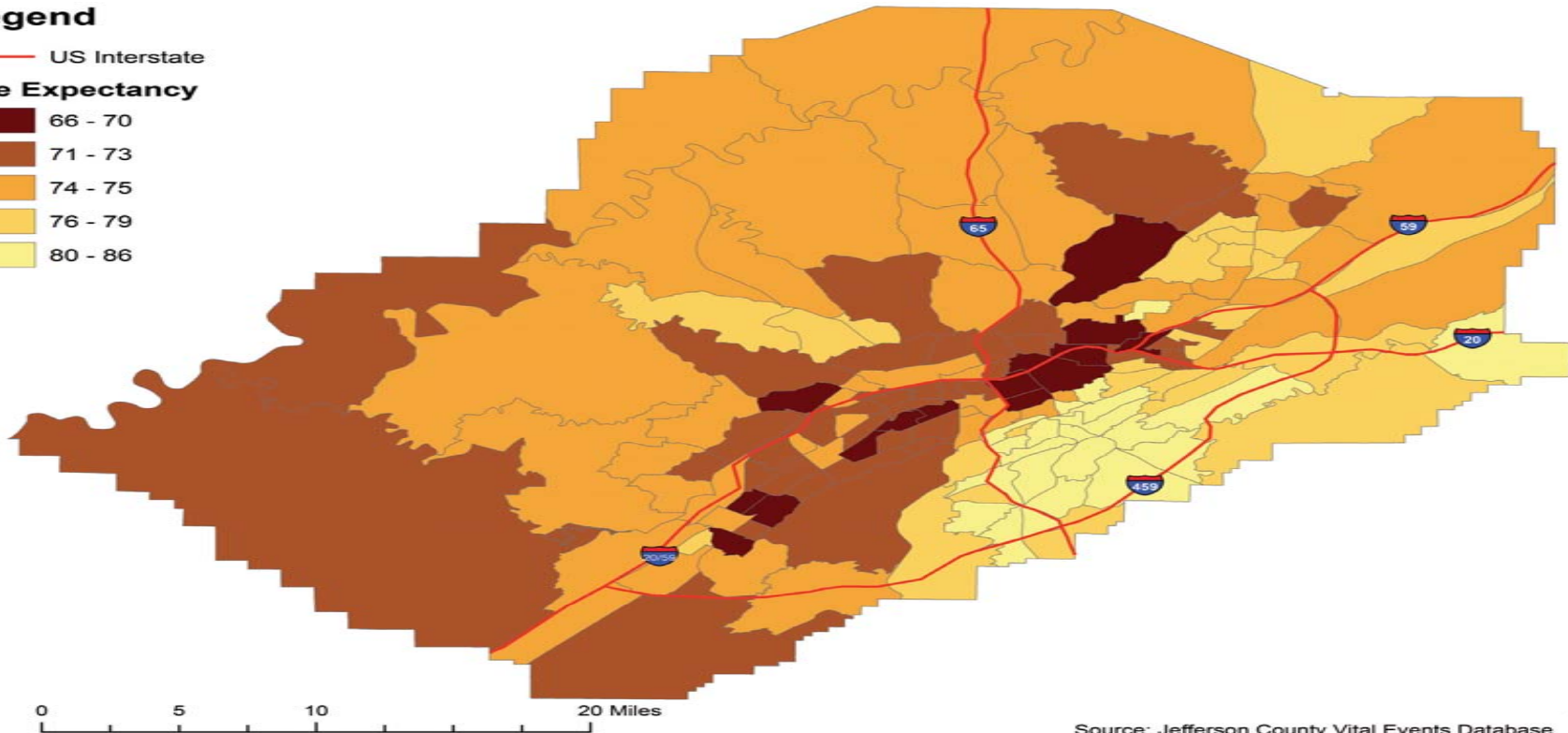
Life Expectancy by Census Tract, Jefferson County (2005-2009)

Legend

— US Interstate

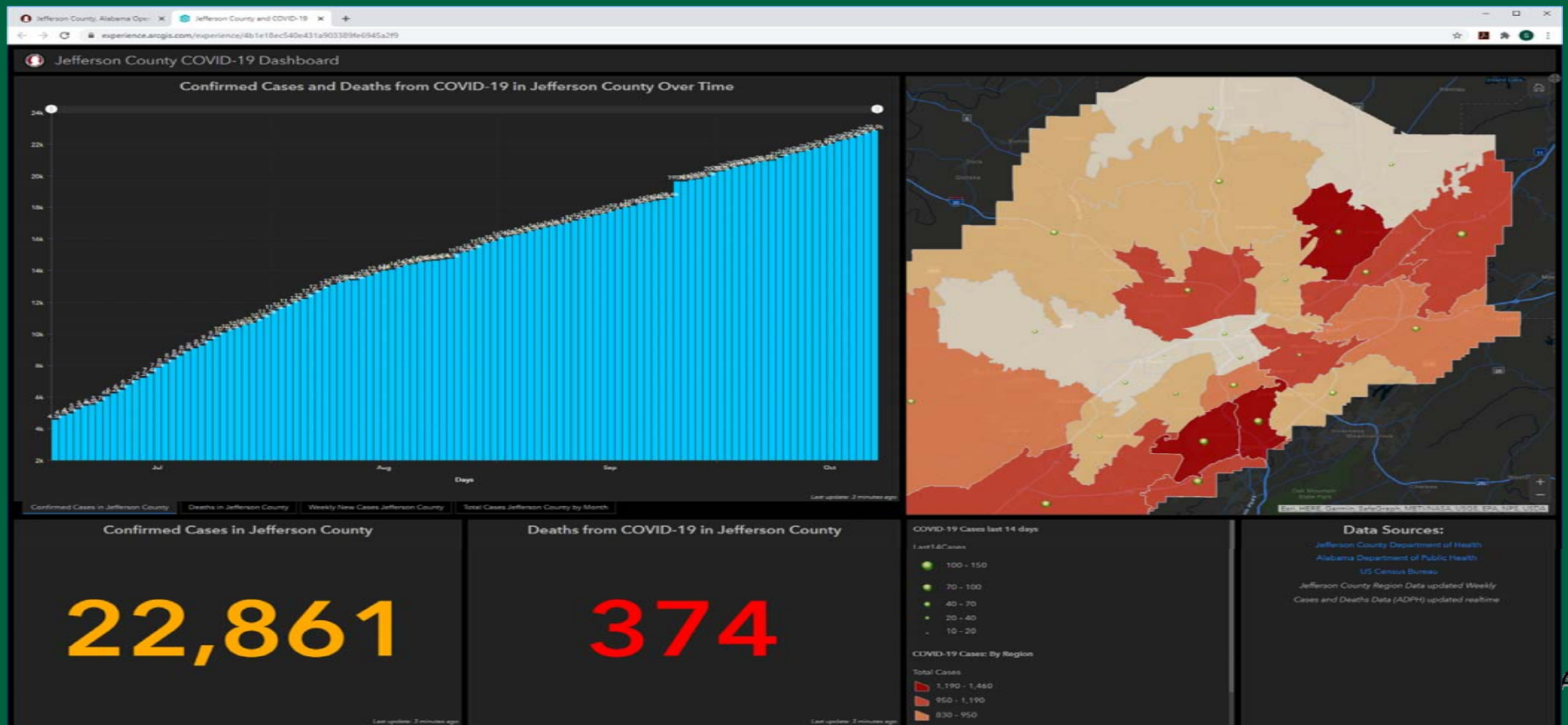
Life Expectancy

66 - 70
71 - 73
74 - 75
76 - 79
80 - 86



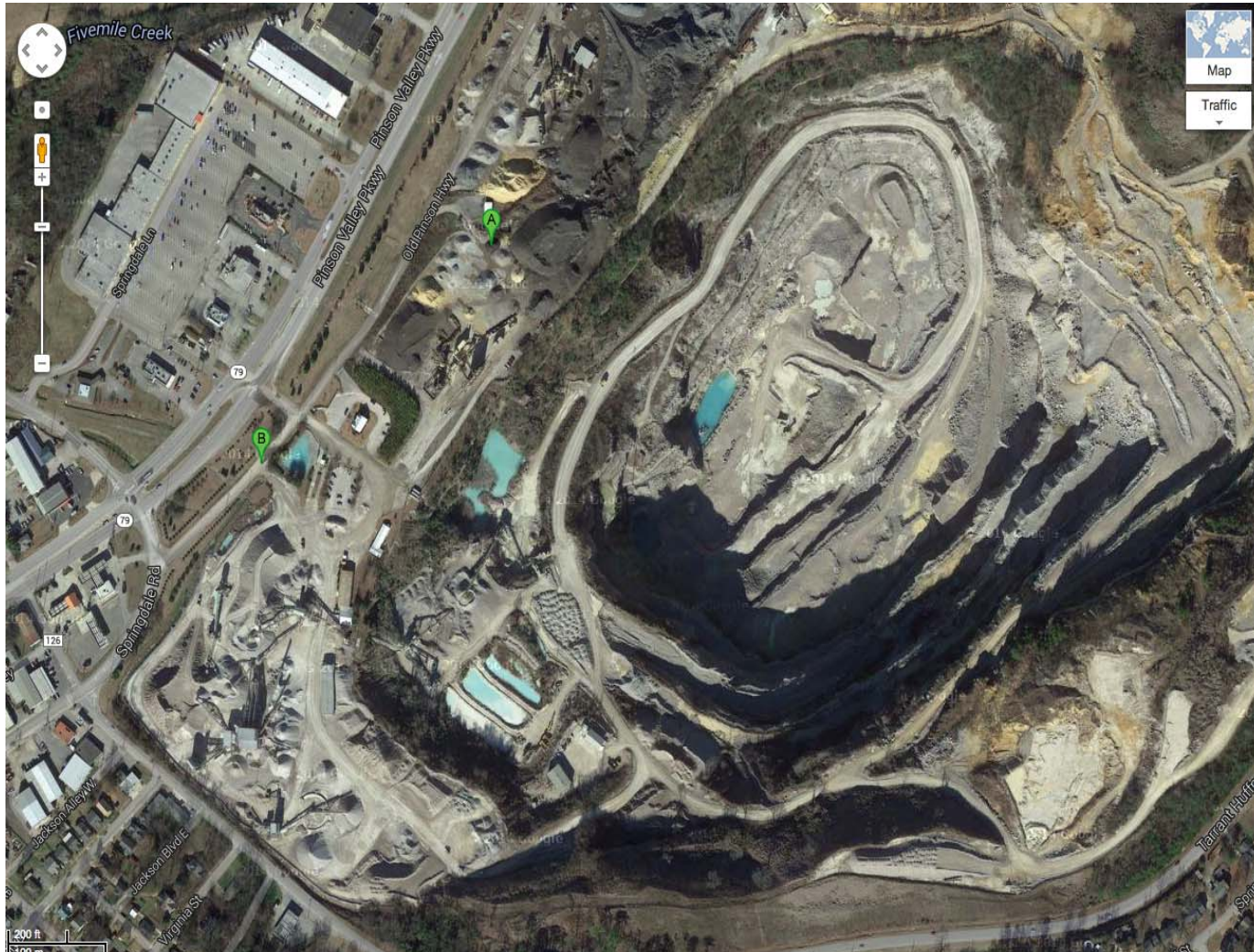
Source: Jefferson County Vital Events Database
Map Producer: Jefferson County Department of Health

COVID-19 in Jefferson County

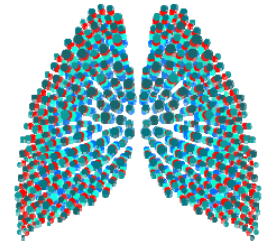




Vulcan Materials Quarry TARRANT, BIRMINGHAM

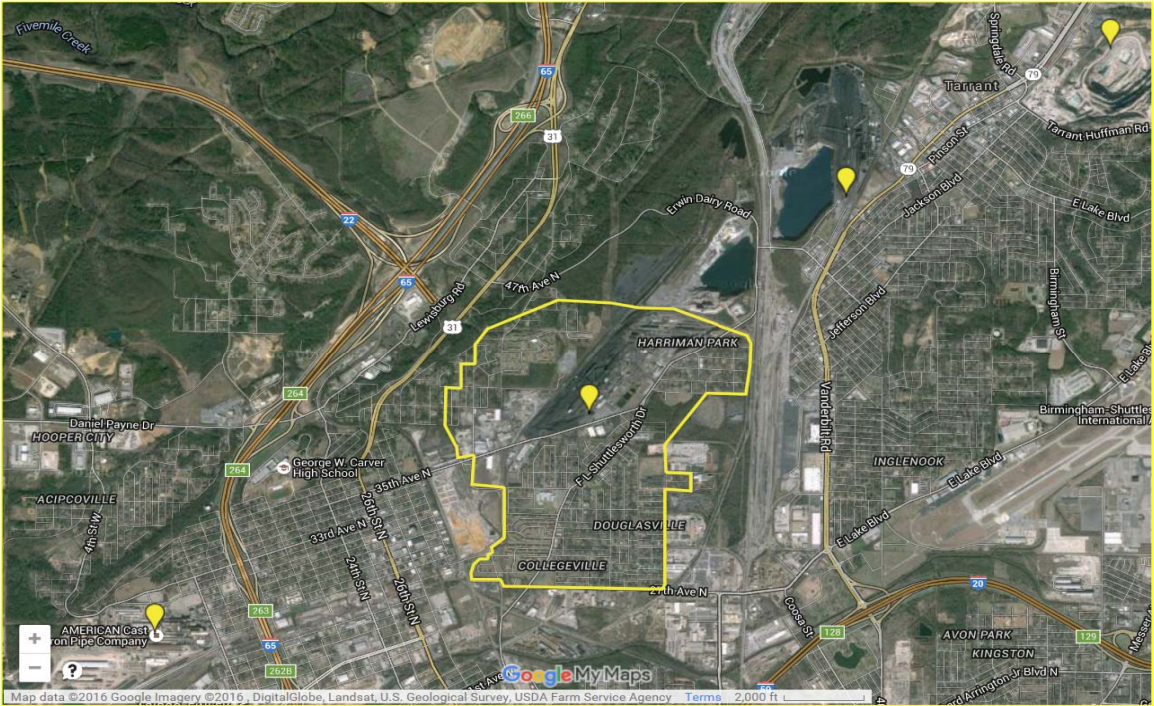
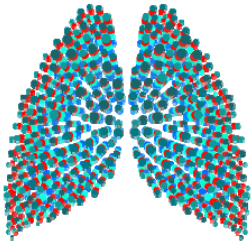


**UAB Superfund
Research Center**



EPA Proposed Superfund site

**UAB Superfund
Research Center**



UAB THE UNIVERSITY OF
ALABAMA AT BIRMINGHAM
Knowledge that will change your world

Homes in Collegeville tested for arsenic



EPA Removing 12" soil around homes in Collegeville



Water Pollution In Valley Creek





We Have Moved!!!

Because of deadly pollutants that have contaminated our building and our grounds, we have moved. Our new temporary location is:

***1238 - Centerpont Parkway in the
Parkway Square Shopping Area.***

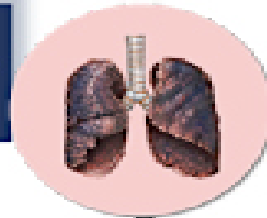
Look forward to seeing you in the fellowship with us!

“God Bless You”!!!

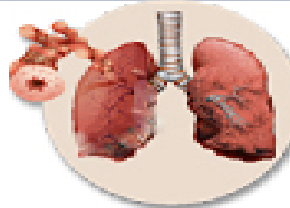
Impact of Airborne Heavy Metals on Lung Disease & the Environment

Biomedical Research Projects

Project 1
Heavy Metal Induced Airway Remodeling and COPD



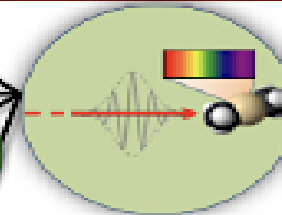
Project 2
Asthma
In Children Exposed to Heavy Metals



Project 3
Heavy Metals Exacerbate Lower Respiratory Tract Infections



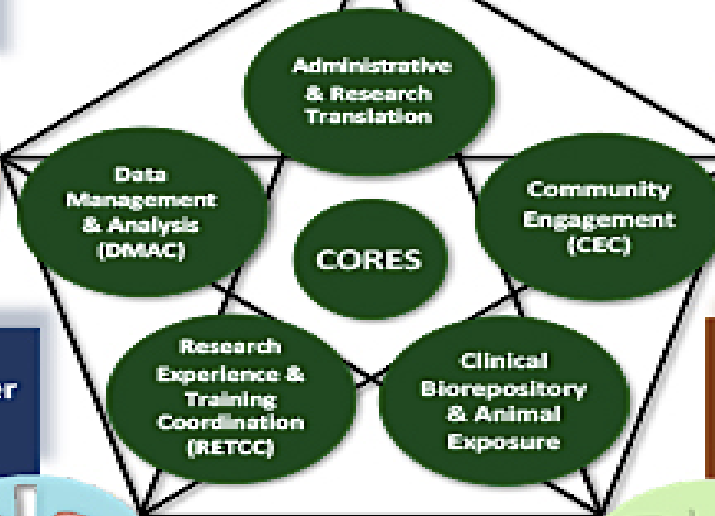
Project 4
Advanced Approaches to Quantifying Exposure to Heavy Metals



Project 5
Nano-micro Hybrid Fibrous Materials for Contaminant Removal and Site Remediation



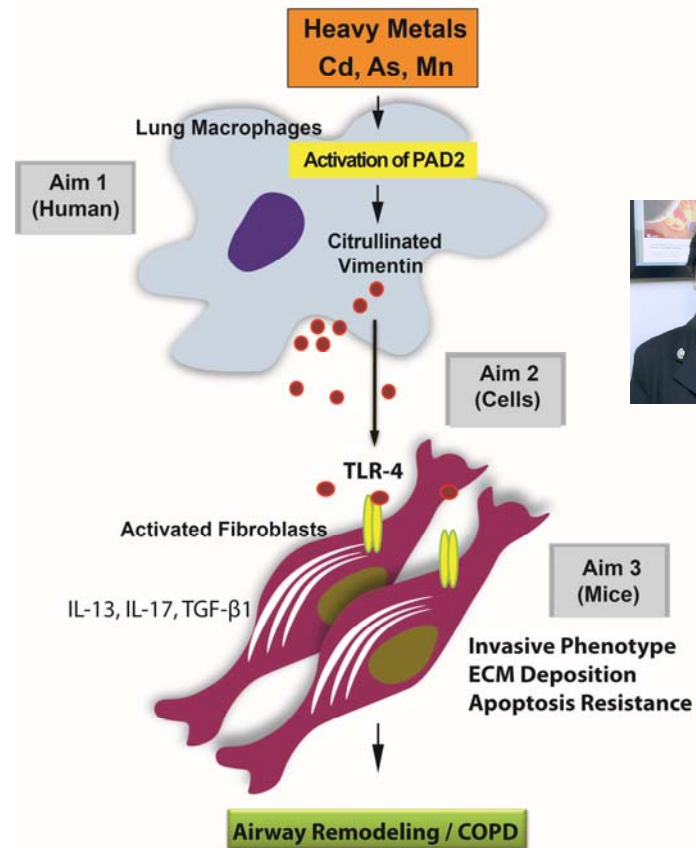
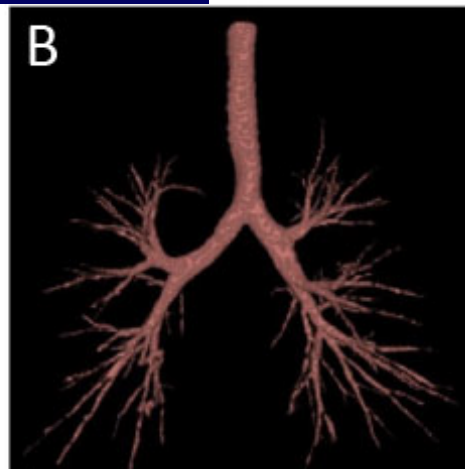
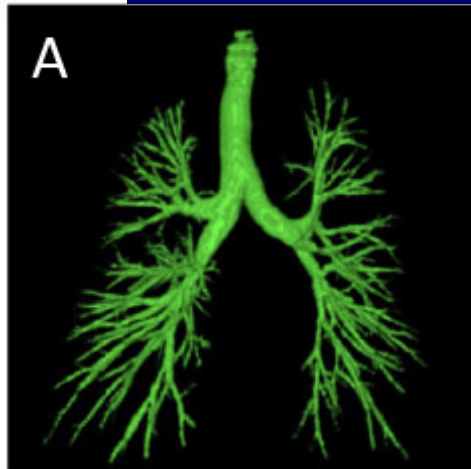
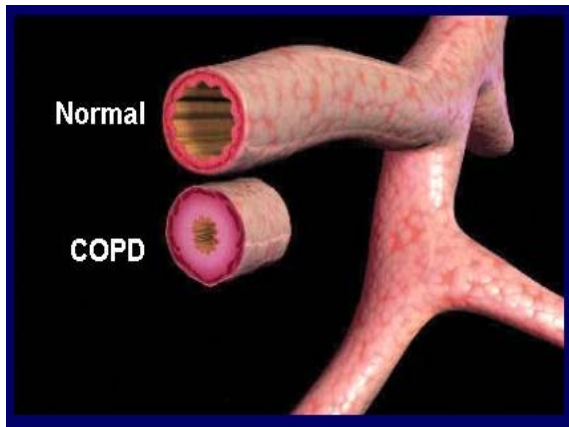
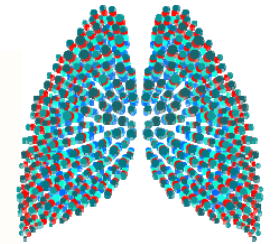
Environmental & Engineering Research Projects



Advancing Knowledge through Community and University Partnership

PROJECT 1: HEAVY METAL INDUCED AIRWAY REMODELING AND COPD (ANTONY)

UAB Superfund
Research Center

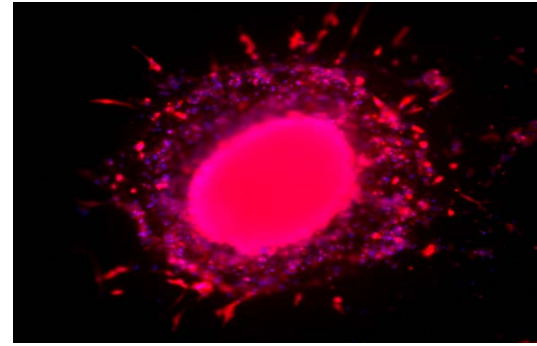
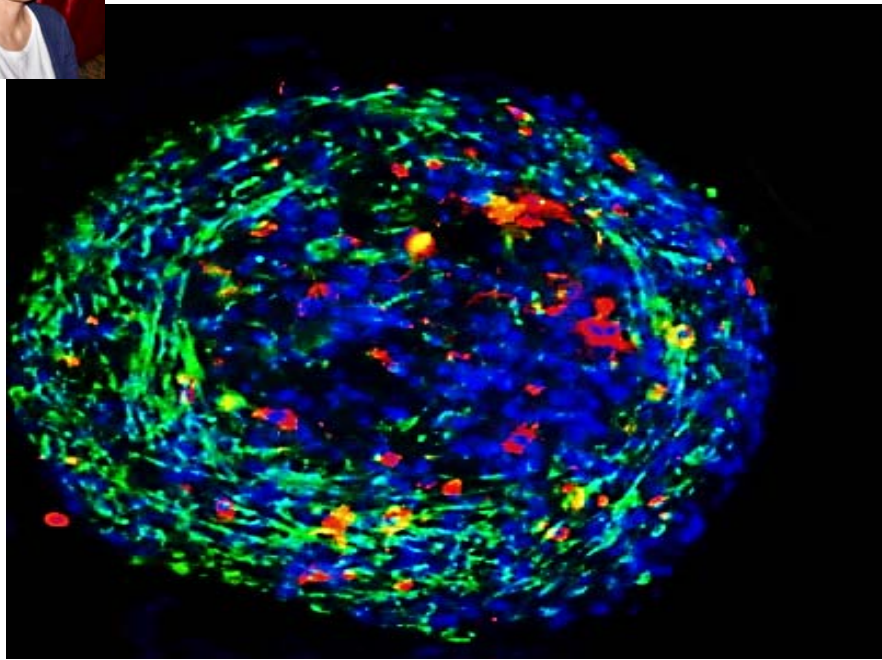
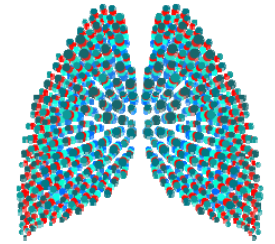


Science Translational Medicine, In Press

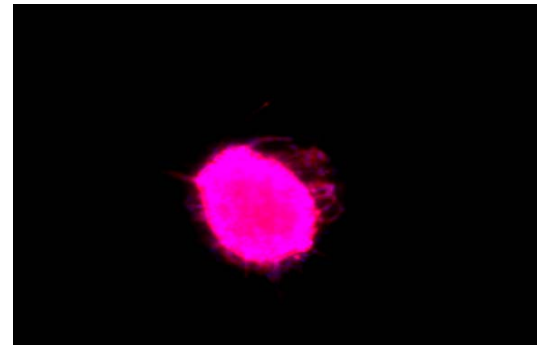


Lung Pulmospheres for Precision Medicine and Toxicity

**UAB Superfund
Research Center**



Invasive

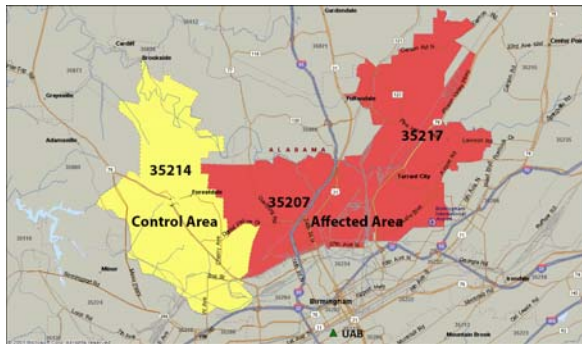


Quiescent

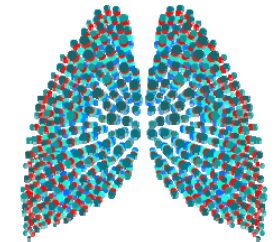
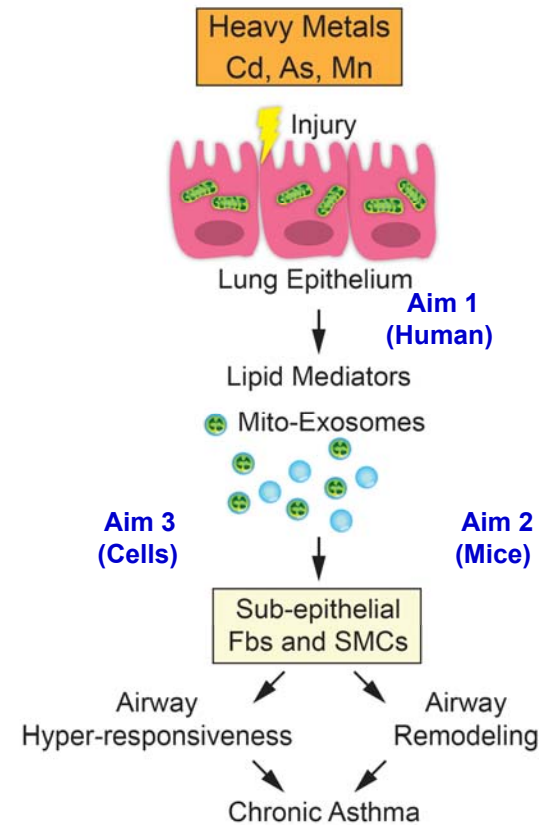
PROJECT 2: ASTHMA IN CHILDREN EXPOSED TO HEAVY METALS (THANNICKAL & DESHANE)

UAB Superfund
Research Center

Superfund site in Birmingham, Alabama



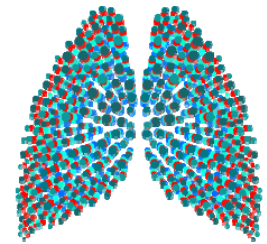
Our hypothesis to be tested in this project is that heavy metal (HM) exposures in children induce airway epithelium injury/activation that triggers the release of exosomal lipids to activate fibroblasts(Fbs)/smooth muscle cells (SMCs) that contribute to airway hyper-responsiveness and remodeling in asthma



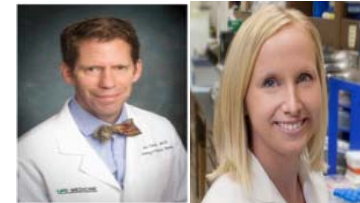
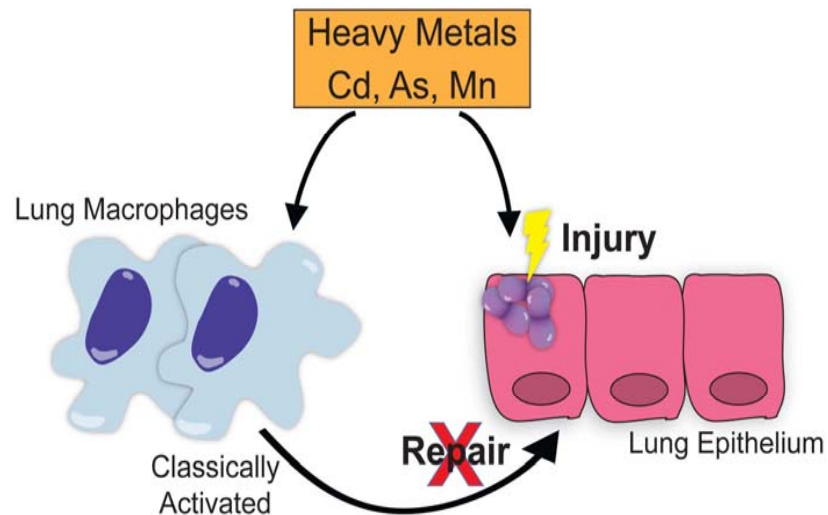
Sci Rep. 2018 Jul 9;8(1):10340. doi: 10.1038/s41598-018-28655-9.

PROJECT #3: HEAVY METALS EXACERBATE LOWER RESPIRATORY TRACT INFECTIONS (CARTER)

UAB Superfund
Research Center



- **We postulate that** exposure to heavy metals exacerbates LRTI and lung injury due to the persistence of lung macrophages that maintain a classically activated phenotype.



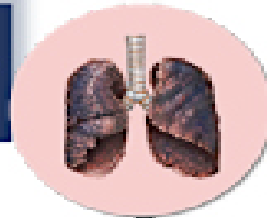
Examining both bacterial and viral organisms

J Clin Invest. 2019 Nov 1;129(11):4962-4978. doi: 10.1172/JCI127959.

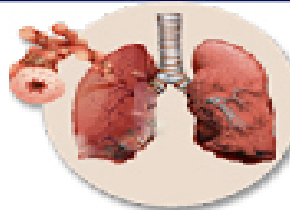
Impact of Airborne Heavy Metals on Lung Disease & the Environment

Biomedical Research Projects

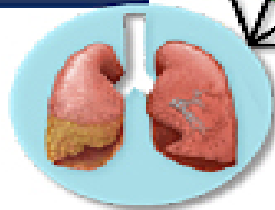
Project 1
Heavy Metal Induced Airway Remodeling and COPD



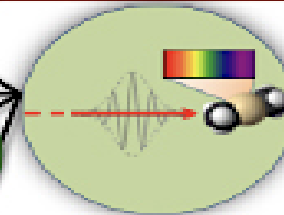
Project 2
Asthma
In Children Exposed to Heavy Metals



Project 3
Heavy Metals Exacerbate Lower Respiratory Tract Infections



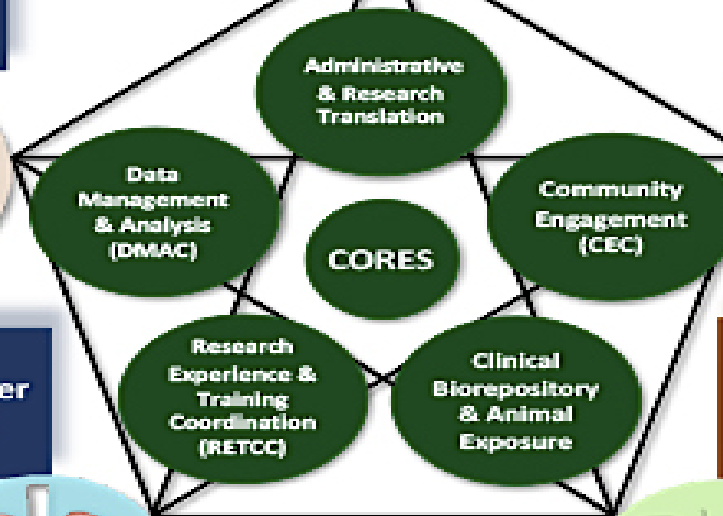
Project 4
Advanced Approaches to Quantifying Exposure to Heavy Metals



Project 5
Nano-micro Hybrid Fibrous Materials for Contaminant Removal and Site Remediation



Environmental & Engineering Research Projects



Advancing Knowledge through Community and University Partnership