



UNIVERSITY OF
LOUISVILLE
CHRISTINA LEE BROWN
ENVIRONE INSTITUTE

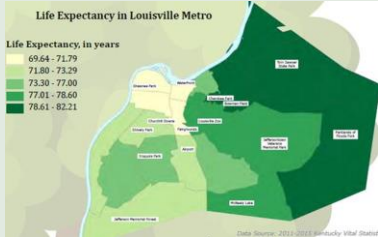
Rachel Keith, PhD, APRN
9/06/2024



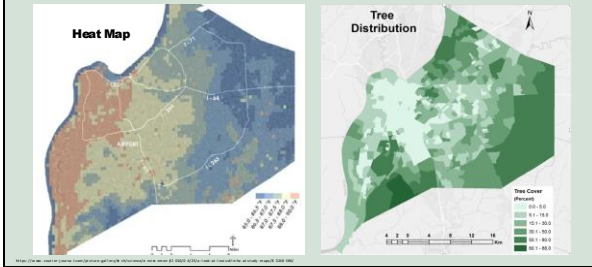
Environmental Health



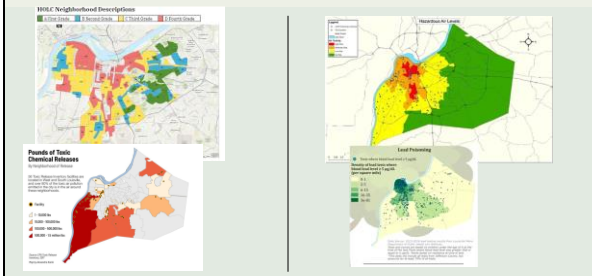
Health Inequities



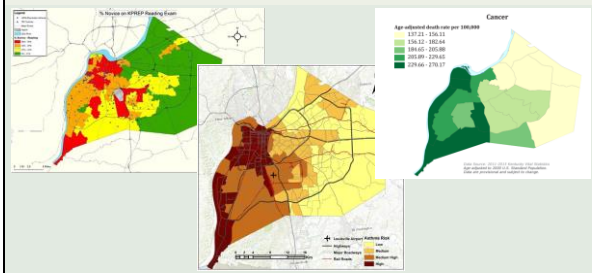
Natural Environment



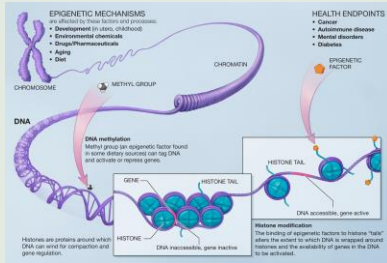
Social Environment



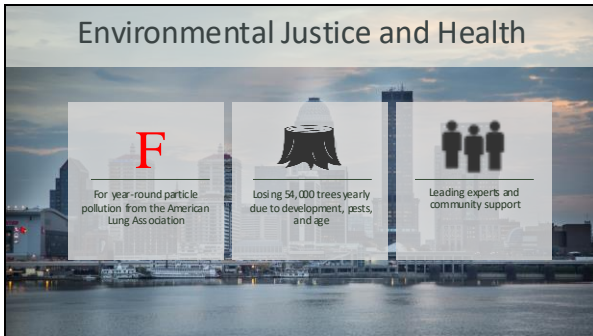
Health Inequities



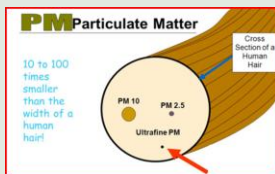
Hereditability



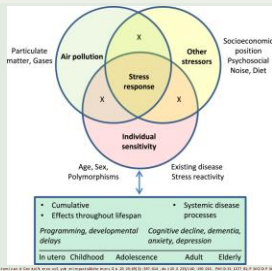
Environmental Justice and Health



Airborne pollution



Environmental Co-exposures



Air pollution and CVD risk



Adjusted Association between roadway proximity and CAC levels

	Total population, n=551		6-month residential duration, n=73	
CAC population	β	p-value	β	p-value
CAC-4 (CD31-/34-/45-/AC133-)	-0.705	0.029*	-1.463	0.001*
CAC-5 (CD31-/AC133-)	-0.735	0.001*	-0.822	0.004*
CAC-11 (AC133-)	-0.620	0.005*	-0.760	0.063
CAC-14 (CD34-/45-/AC133-)	-1.260	0.007*	-1.011	0.004*

ATVB 2498, 2015

Air pollution and vascular health

Customer Data available at [ScienceDirect](#)

Toxicology and Applied Pharmacology
Journal homepage: www.elsevier.com/locate/yap

Environmental exposure to volatile organic compounds is associated with endothelial injury

Daniel W. Riggs^{a,b,c,d,e}, Maria V. Matarichuk^{a,b,c,d}, Hong Guo^{a,b,c,d}, Kellyn E. McNamee^{a,b,c,d}, Brandon K. Taylor^{a,b,c,d}, Tareena Kishore^{a,b,c,d}, Shosh N. Rai^{a,b,c,d}, Rachel J. Smith^{a,b,c,d}, Anand Bhambhani^{a,b,c,d}, George Kishore^{a,b,c,d}

Environmental Research
Journal homepage: www.elsevier.com/locate/environres

Exposure to airborne fine particulate matter is associated with impaired endothelial function and biomarkers of oxidative stress and inflammation

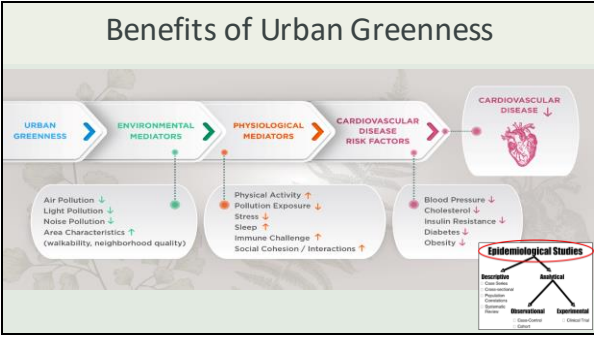
Daniel W. Riggs^{a,b,c,d}, Nigam S. Zaidi^{a,b,c,d}, Jeffrey Kishore^{a,b,c,d}, Ray Younger^{a,b,c,d}, Shosh N. Rai^{a,b,c,d}, Anand Bhambhani^{a,b,c,d}, Timothy S. O'Toole^{a,b,c,d}

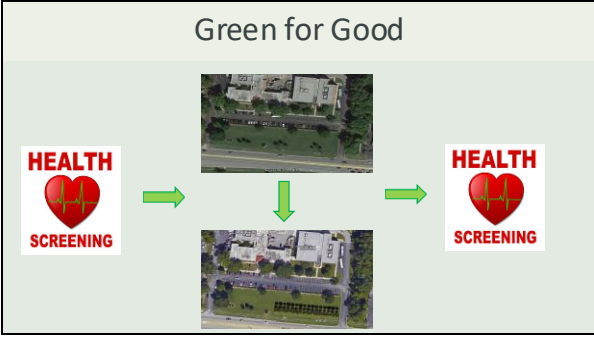
Exposure to Volatile Organic Compounds Is Associated with Hypertension in Black Adults: The Jackson Heart Study

Kristen A. Johnson^{a,b,c,d}, Steven L. Brundage^{a,b,c,d}, Daniel W. Riggs^{a,b,c,d}, Shosh N. Rai^{a,b,c,d}, Tareena Kishore^{a,b,c,d}, Brandon K. Taylor^{a,b,c,d}, Rachel J. Smith^{a,b,c,d}, Anand Bhambhani^{a,b,c,d}, George Kishore^{a,b,c,d}, Ray Younger^{a,b,c,d}, Timothy S. O'Toole^{a,b,c,d}













G4G Results



Children
and
Adults
m24

↑ Endothelial progenitor cells
↓ Immune cell populations
✓ Platelet monocyte aggregates
✓ Adults and children
✓ Cholesterol, BMI, W:H or weight
↓ VOC

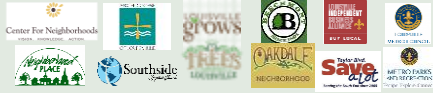


UFF mean concentration is 60% lower behind the biofilter under certain wind conditions

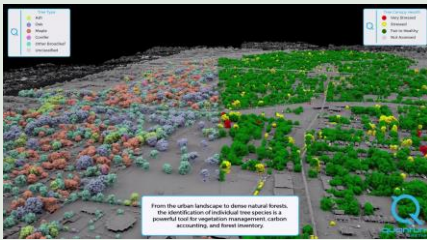
Biofilters could reduce the risk of heart disease and chronic inflammatory conditions such as asthma or diabetes.



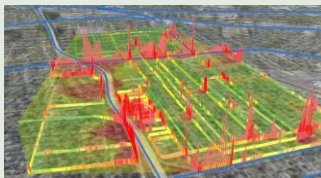
Community Engagement



Greening



Green for Good

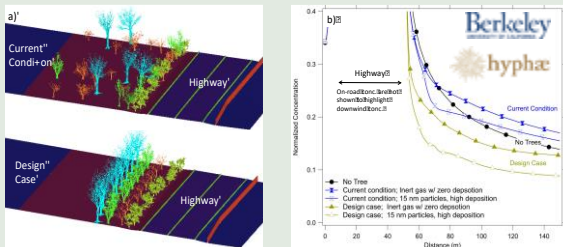


Cleveland State University

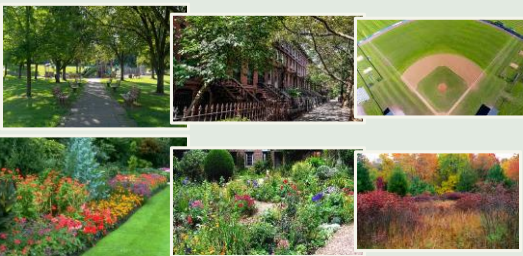
Biodiversity



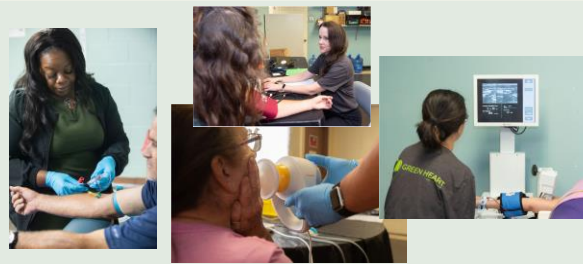
Biofiltration Modeling



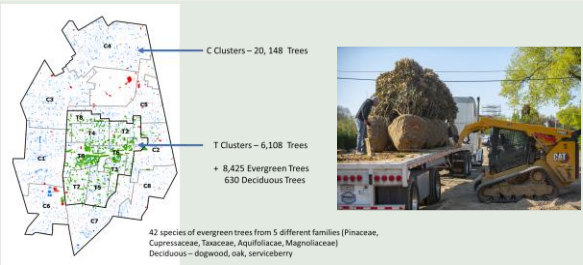
Perceptions of Greenness



Clinical Phenotyping



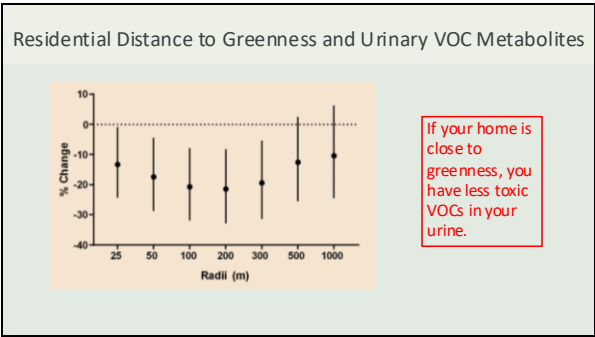
Tree Intervention

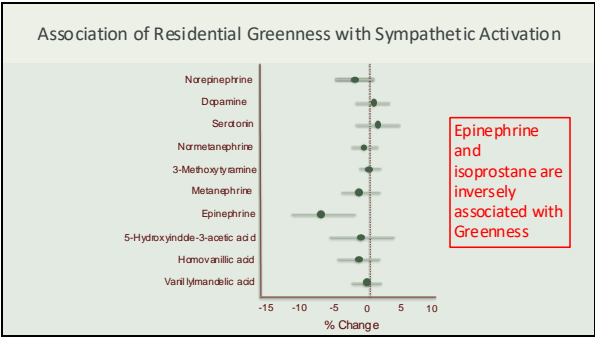


Residential Greening

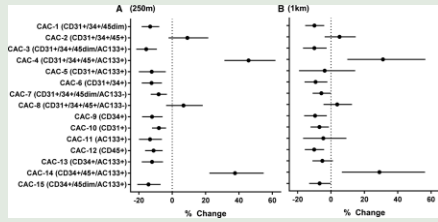






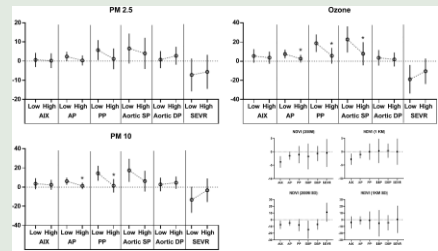


Circulating Angiogenic Cells



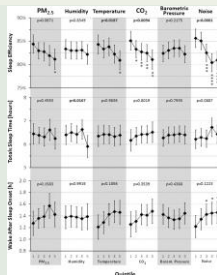
11 of the 15 CAC, a marker of CVD risk, were inversely associated with Greenness

Vascular Health



The effects of pollution on vascular health are more pronounced in areas with low greenness.

Sleep



Sleep efficiency decreased in a dose-dependent manner with increasing levels of PM2.5, temperature, CO2, and noise.

Inflammation



hsCRP, a biomarker of inflammation, was decreased by 13-20% in the people who lived where the trees were planted. This will increase their risk of chronic disease.

Other Results



Green Studies

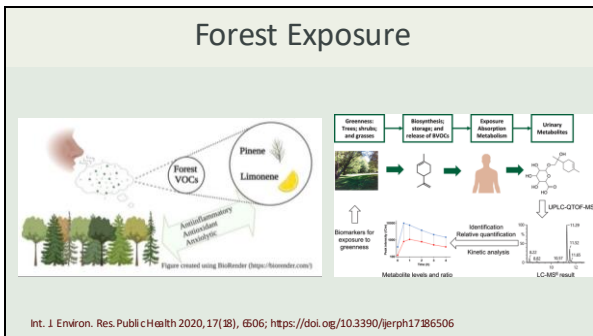


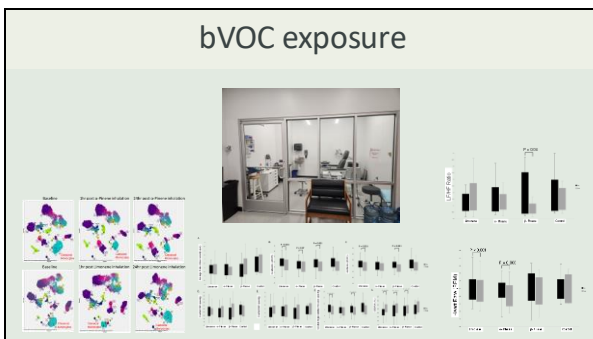




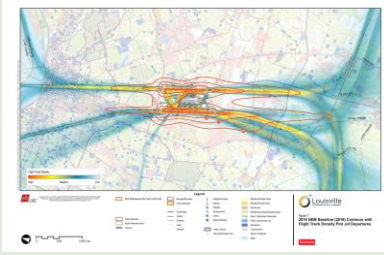








Discuss sleep and solutions

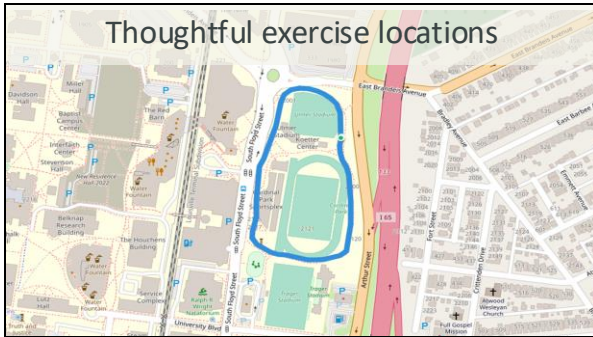


Support solutions to reduce air pollution



Support air pollution remediation

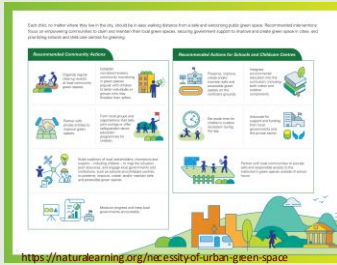








More green time, less screen time



Collaborators and Partners

• Envirome Institute

- Aruni Bhatnagar
- Sanjay Srivastava
- Israel Sithu
- Pawel Lorkiewicz
- Marina Malovichko
- Ray Yeager
- Dan Riggs
- Clara Sears
- Cameron Stopforth
- Allison Smith
- Jackie Gallagher
- Exile Lukudu
- Shweta Srivastava



Questions?
