

HERCULES
EXPOSOME RESEARCH CENTER

HERCULES Pilot Program

General Information Session

November 4, 2026

Mike Caudle, PhD

Pilot Program Director

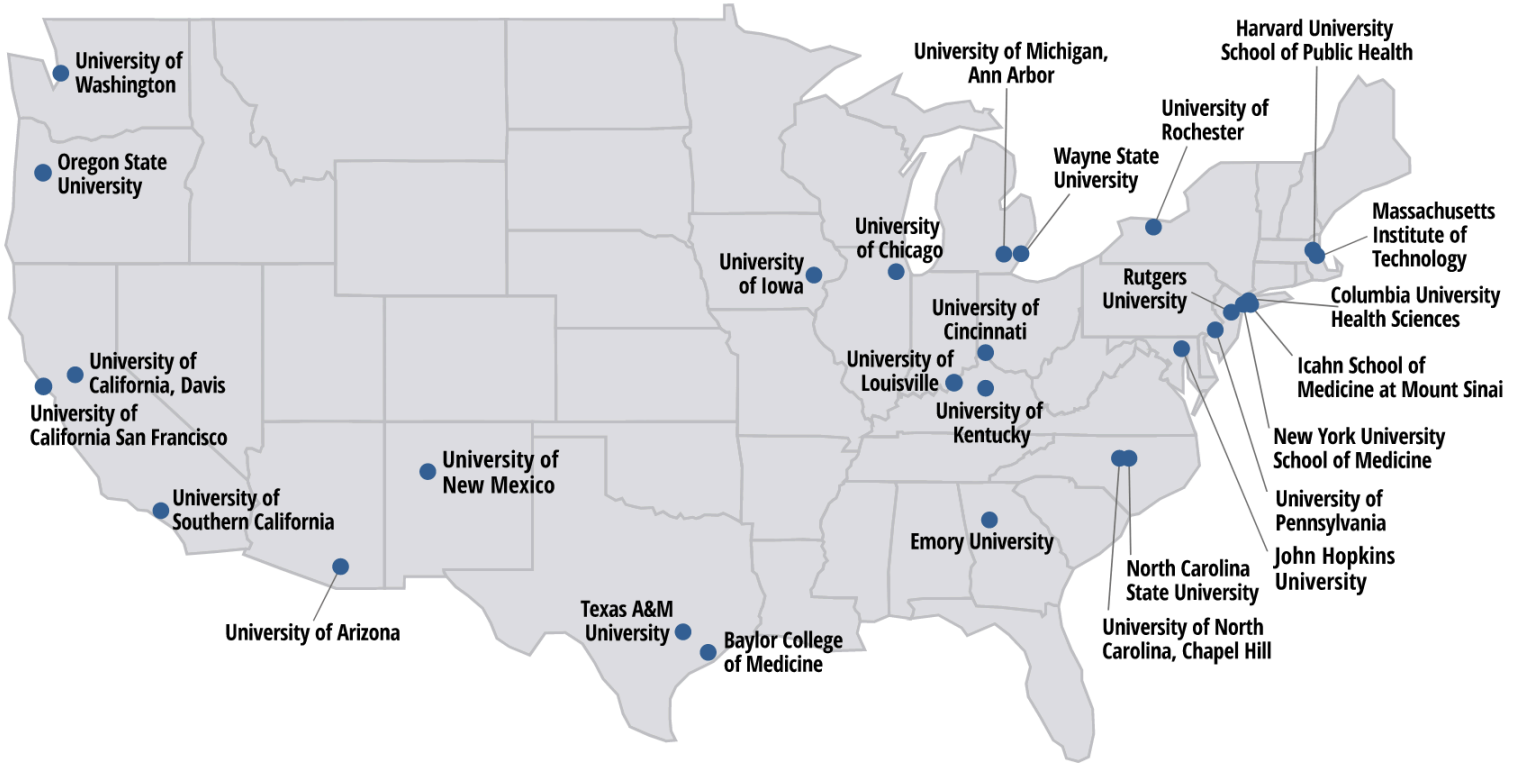
Gangarosa Department of Environmental Health, RSPH

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What is HERCULES?

Human **E**xposome **R**esearch **C**enter: **U**nderstanding **L**ifetime **E**xposure**S**

- National Institute of Environmental Health Sciences Core Center (P30)
- **Facilitate Collaboration** by funding **Institutional Infrastructure** to support environmental health researchers
- Identify emerging environmental issues and advance understanding of environmental impact on human health

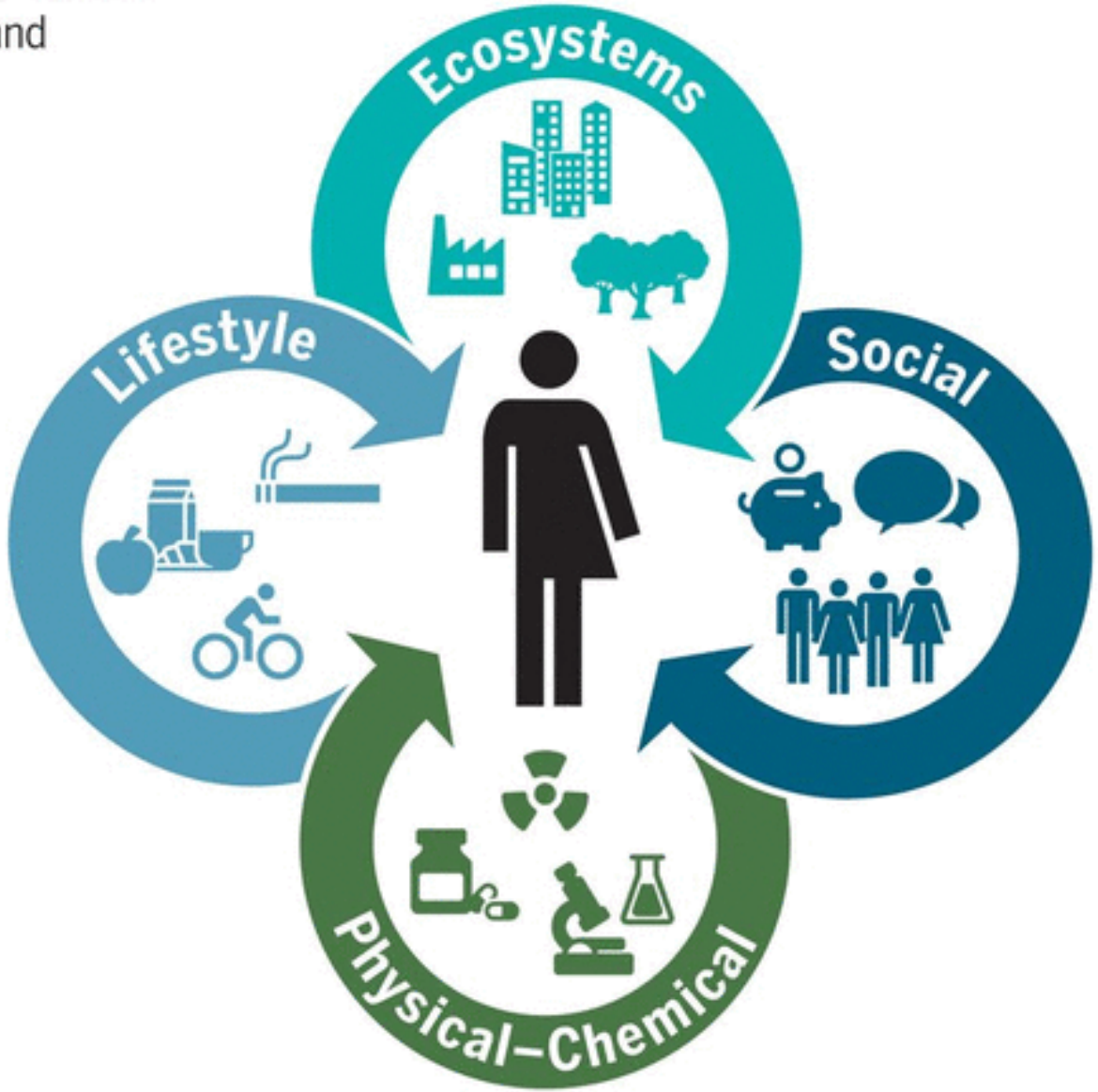


Exposome

Ecosystems
Food outlets, alcohol outlets
Built environment and urban land uses
Population density
Walkability
Green/blue space

Lifestyle
Physical activity
Sleep behavior
Diet
Drug use
Smoking
Alcohol use

Social
Household income
Inequality
Social capital
Social networks
Cultural norms
Cultural capital
Psychological and mental stress



Physical–Chemical
Temperature/humidity
Electromagnetic fields
Ambient light
Odor and noise
Point, line sources, e.g, factories, ports
Outdoor and indoor air pollution
Agricultural activities, livestock
Pollen/mold/fungus
Pesticides
Fragrance products
Flame retardants (PBDEs)
Persistent organic pollutants
Plastic and plasticizers
Food contaminants
Soil contaminants
Drinking water contamination
Groundwater contamination
Surface water contamination
Occupational exposures

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Center Vision: Serve as an intellectual hub in the advancement and translation of **exposome** research to improve human health

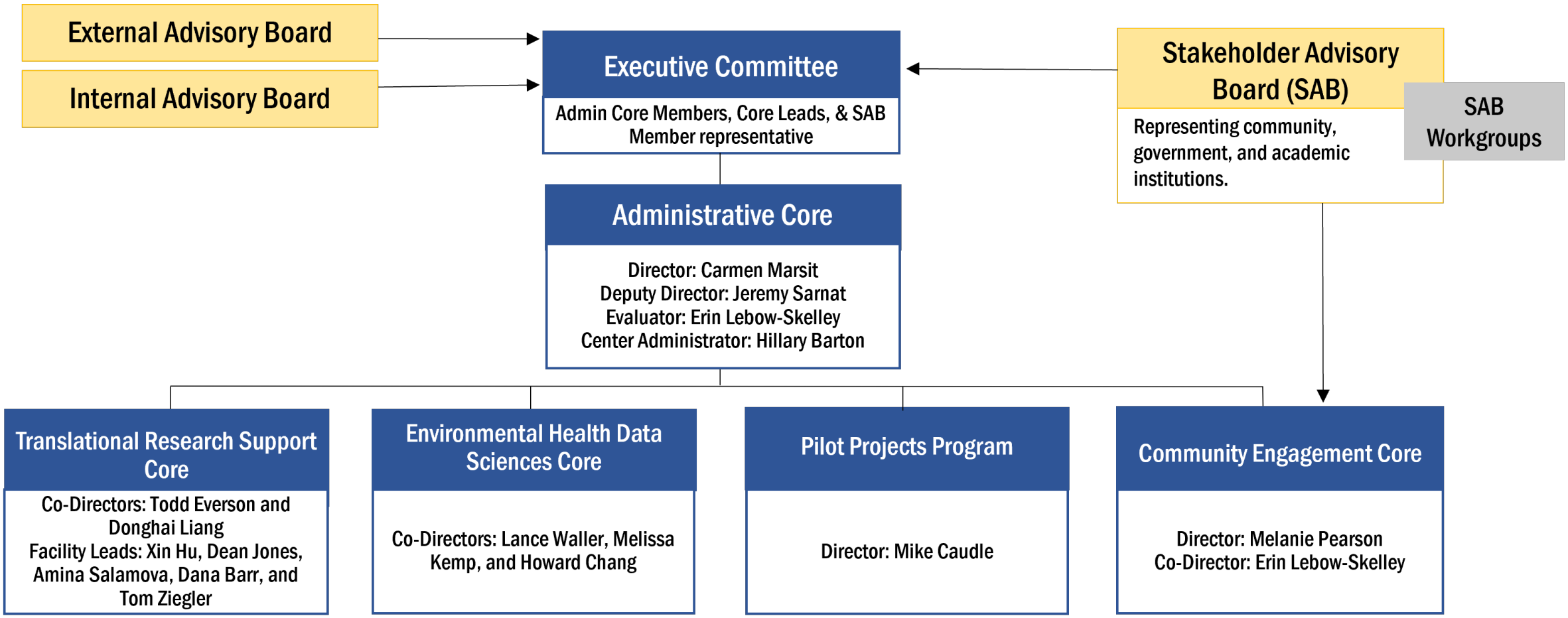
Center Mission: Learn how the **exposome** affects health and community well-being and use that knowledge to improve human health

Activities:

1. Innovate the tools, application, and data science of **exposome** research
2. Promote and grow translational environmental health research at Emory and Georgia Tech
3. Strengthen and expand partnerships with metro Atlanta area communities to enhance their ability to assess their **exposome** and respond to their environmental health priorities

<u>Support Pilot Projects to develop new collaborations, new tools, and new research</u>

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Goals of the HERCULES Pilot Program

- To stimulate interdisciplinary collaborations and new EH-related research directions
- To promote the development of early career investigators
- To support community-engaged research
- To promote translational research in environmental health sciences
- To support the development of R-level grants from NIEHS

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- **To stimulate interdisciplinary collaborations and new EH-related research directions**
  - 2026-2027: 67% of pilot awardees were new to the environmental health sciences field

Plastic and Chemical Exposure, Gut Health, and Recovery in Babies with Congenital Heart Defects

Study Title: CHIME – Congenital Heart Infant Microbiome and Early-life Exposures Study

PI: Michael P. Fundora

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- **To promote the development of early career investigators**
  - 2026-2027: 50% of pilot awardees were early career investigators

How Common Pesticides Affect Developing Brain Cells

Study Title: Determining the Impact of Environmental Toxicants on Human Neural Progenitors Using Machine Learning-Based Organelle Morphology Classification at Scale

PI: Fikri Birey

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- **To support community-engaged research**
  - 2026-2027: ~60% of pilot awards were community-engaged

Designing Community-Led Public Health Surveillance in Rural Areas

Study Title: From Data Extraction to Data Sovereignty: Community- Driven Public Health Surveillance

PI: Marlene Wolfe

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- **To promote translational research in environmental health sciences**
  - 2026-2027: 100% of pilot awards were considered translational

Improving Childhood Cancer Survival by Reducing Air Pollution

Study Title: PEdiatric Air pollution Research in Leukemia (PEARL)

PI: Michael Scheurer

Translational Research from an Environmental Health Sciences Perspective

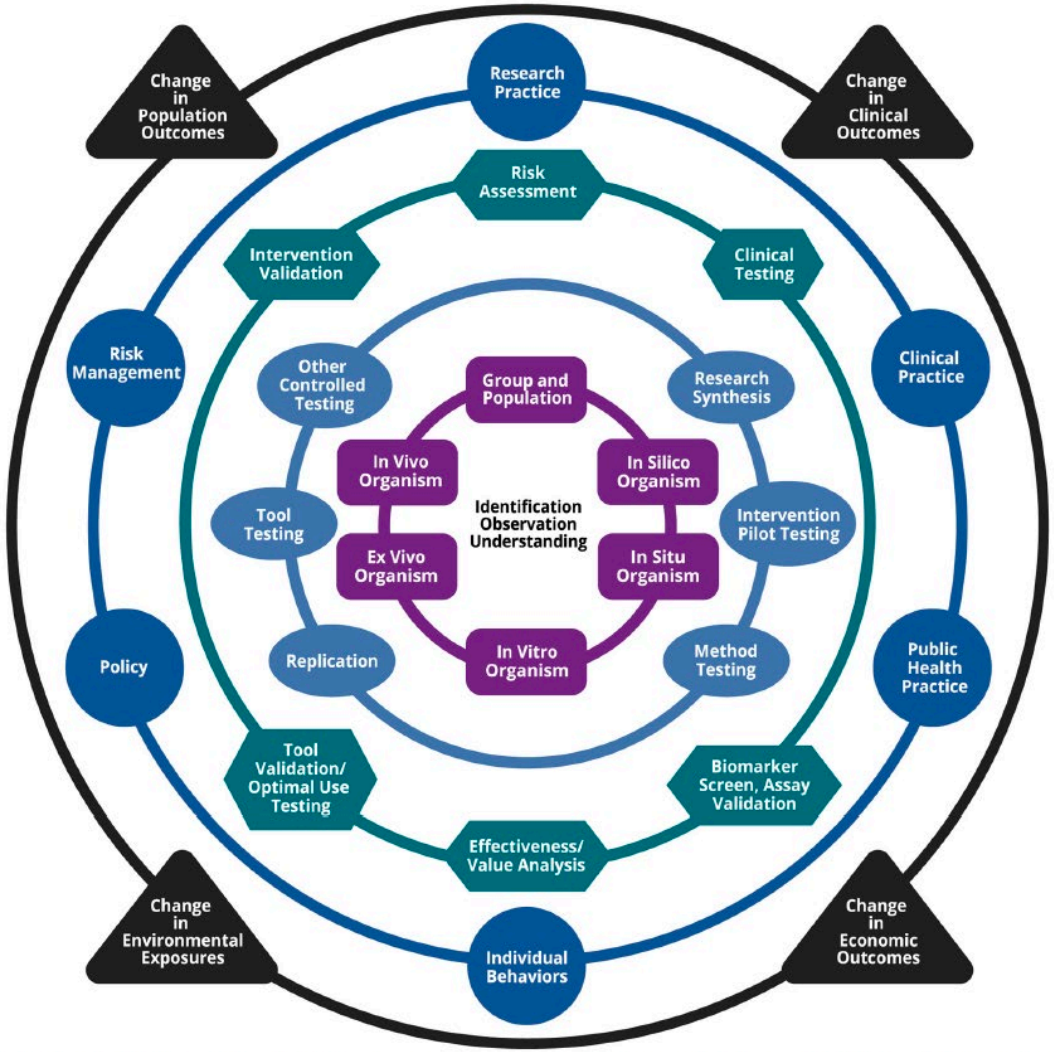


Figure 4. The full translational research framework represents five categories of translational research in concentric rings: Fundamental Questions (rectangles), Application and Synthesis (ovals), Implementation and Adjustment (hexagons), Practice (circles), and Public Health Impacts (triangles). Within each ring, nodes describe the types of activities that might occur.

Pettibone et al (2018) Expanding the Concept of Translational Research: Making a Place for Environmental Health Sciences. *Environ Health Perspect* 126(7): 074501. PMID: 30024381

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- **To support the development of R-level grants from NIEHS**
  - 4-year pilot award investment: $650,000
  - R-Level funding: ~$28.0M

Measuring "forever chemicals" in North Georgia communities.

Study Title: Assessing the impact of state of the art water treatment plant on pFAS reduction among Rome, GA residents

PI: Melanie Pearson

Climate change, Hazardous Waste and Environmental Justice in Brunswick, GA

PI: Noah Scovronick, School of Public Health, Environmental Health

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Areas of Focus for Pilot Applications

- Basic Biological Research
- Individual Susceptibility
- The Microbiome
- The Exposome
- Co-exposures (including multiple contaminants as well as social factors)
- Predictive and High-Throughput Toxicology
- Genomics, epigenomics
- Bioinformatics, systems biology, machine learning, environmental data science
- Single-cell technologies
- Novel *in-vitro* and *ex vivo* systems
- Spatio-temporal and multipollutant statistical models
- Interventional studies
- Community-Engaged Research

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Planned Awards for 2027-2028

- 6 awards of $30,000
- Faculty at Georgia Tech are eligible to apply, provided that their plan includes collaboration with Emory Scientists
- Collaborative funding by Winship Cancer Institute is available for proposals on the exposome and cancer
- One award specifically for Community-Engaged Research
- Enhance Grants
  - Up to $5,000 to obtain critical data for imminent grant submissions
  - Reviewed on a rolling basis
  - Separate submission and review criteria
  - Submission between April 16, 2027 and January 17, 2028

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Community-Engaged Research (CER) Guidelines

- Address local environmental health concerns
- Community members/partners participate meaningfully in the development of the research questions and research design, as well as study implementation (e.g., data collection), with resources shared (e.g., compensating partner's time)
  - *Recommended to develop a memo of understanding (MOU)*
- The research team and community partner should plan to disseminate study results directly to the community
- The HERCULES Community Engagement Core should be consulted for CER applications Melanie Pearson (mapears@emory.edu)
- Must be submitted through the Emory faculty member and are subject to the standard requirements of the Pilot Project Program

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Use of Human Subjects

Will your study include human subjects or data (biospecimens or information) obtained from living individuals? If yes, please briefly describe the data in a few sentences and prepare to complete the NIH Human Subjects forms as part of this application. Contact Hillary Barton (hillary.barton@emory.edu) for required forms or any questions

- NIH-Format Protection of Human Subjects section
- NIH-Format Planned Inclusion Enrollment Report or Cumulative Report if working with existing data

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Pilot Projects Involving Foreign Location or Partners

- Permitted, but require additional approvals
- Contact Hillary Barton (hillary.barton@emory.edu), Center Administrator, before submitting LOI to determine feasibility

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Pilot Grant Review Criteria

- Revised NIH criteria (Simplified Review Framework)
  - Importance of the Research
  - Rigor and Feasibility
  - Expertise and Resources
- Relevance to the missions of HERCULES and NIEHS
  - HERCULES: Learn how the exposome affects health and community well-being and use that knowledge to improve human health
  - NIEHS: Research how the environment affects biological systems across the lifespan and to translate this knowledge to reduce disease and promote human health.
- Likelihood of R-level NIEHS funding
  - 300-word statement in application
- Emphasis on cutting-edge approaches and technologies, especially **use of the facility cores**
- Stimulating interdisciplinary collaboration
- Promoting translational research

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Pilot Program Timeline

- **December 7, 2026 – LOI Due**
- December-January - Core Meetings
  - Data Science
  - Translational Research Support
    - Targeted and Untargeted Analytical Services
    - Clinical and Population Research Services
  - Community Engagement
- **February 5, 2027 – Full Application Due**
- Mid- February 2027 – Study Section
- March 2027-Announce Pilots
- **April 1, 2027 – Pilot Funding Begins**
- December 3, 2027 - Midpoint Report
- **March 31, 2028 – Funding Ends**
- April 30, 2028 - Final Report