

## **Center for Children’s Health, the Environment, the Microbiome, and Metabolomics (C-CHEM<sup>2</sup>) Summer Undergraduate Research Internship (SURI)**

**Purpose:** The purpose of this program is to expose students to the field of children’s environmental health research and to provide students a meaningful interdisciplinary research internship while working with Center investigators.

**Program Description:** Students will engage in 10 weeks of research under the direction of one of our Center investigators from either the School of Nursing, School of Medicine, Emory College of Arts and Science, or the School of Public Health. Students will be placed with a mentor based on their career and research interests and the current needs of the Center. The student’s mentor will be ultimately chosen by the Center investigators. SURI students are expected to work full time on a research project, which will be determined during the first week of the program by the assigned mentor. Students will work under the direction of a Center investigator but will be assigned an additional co-mentor (research staff, graduate students, or postdocs) who will meet at least weekly with the SURI intern to support the student’s efforts and provide guidance as needed. The student will work with their mentors to outline a relevant literature review and develop a research plan, which will include a specific research question, the design, and methods to answer the research question. During the first month of the rotation, students will spend one week rotating in each of the three labs within the Center as well as with the Community Outreach and Translation Core. Students will spend half the day observing the day to day operations of the project or core during this rotation phase. This rotation will allow the student to gain a global perspective on the work of the Center. Students will spend a significant amount of time attending research meetings, conducting a background literature review, collecting and analyzing data, and preparing for a final presentation of their work and findings. SURI interns may, at the discretion of their mentor, be expected to present a poster or final oral presentation of their results and or participate in the Emory Summer Undergraduate Research Experience (SURE) program activities. Students may also be invited to attend guest lectures or participate in other Center activities. Students will be provided a stipend of \$4,000 to cover living expenses.

### **Center Overview:**

Linda A. McCauley, RN, PhD Dual Principal Investigator  
P. Barry Ryan, PhD Dual Principal Investigator

Researchers at the Center for Children’s Health, the Environment, the Microbiome, and Metabolomics (C-CHEM<sup>2</sup>) conduct research to understand the complex interactions among components of the prenatal and postnatal environment — toxicant exposures, the microbiome, and the metabolome — and their impacts on birth outcomes and infant health and neurodevelopment. The human microbiome is representative of microbial organisms that reside in the gut, while the metabolome represents the collection of metabolites and small molecules found in the bodily tissues, organs, and cells.

Environmental exposures among residents of the urban Southeast are likely distinctive from people in other parts of the United States; however, no studies have characterized exposures among minorities within this region from birth. C-CHEM<sup>2</sup> leverages data and samples from a newly funded cohort of more than 800 African American women and their children living in metropolitan Atlanta to investigate how behavioral factors and the microbiome impact preterm birth and how epigenetics and genetics affect the microbiomes of study participants. The center also leverages rich datasets and resources within the NIEHS-funded Human Exposome Research Center: Understanding Lifetime Exposures (HERCULES) at Emory, and an interdisciplinary team of scientists with expertise in environmental health, neurodevelopment, maternal-child health, and preventive medicine.

### **Project 1: Characterizing exposures and outcomes in an urban birth cohort (CHERUB)**

Project leaders: Dana B. Barr, PhD, and Anne Dunlop, MD, MPH

In this project, researchers are following an urban birth cohort of African American mother-infant pairs to study pre- and postnatal environmental exposures and the independent and interactive effects of these exposures on the maternal microbiome and health outcomes, such as preterm birth.

### **Project 2: Microbiome, environment, and neurodevelopmental delay (MEND)**

Project leaders: Patricia A. Brennan, PhD and Jeannie Rodriguez, PhD, RN

Researchers in this project are following an urban birth cohort of African American mother-infant pairs to determine how prenatal and postnatal environmental exposures influence the infant gut microbiome as well as neurodevelopment and behavior during the first 18 months of life.

### **Project 3: Metabolic, microbiome, and toxicant-associated interactions (MATRIX)**

Project leaders: Elizabeth J. Corwin, PhD, RN, FAAN, Dean P. Jones, PhD

Researchers are employing high-resolution metabolomics analysis techniques to characterize metabolites and metabolic pathways in biological samples collected from an urban birth cohort of African American mother-infant pairs. Researchers will investigate associations between specific metabolites and metabolic pathways and pre- and postnatal environmental exposures, the maternal and infant microbiome, and infant birth and neurodevelopmental outcomes during the first 18 months of life.

### **Community Outreach and Translation Core (COTC)**

Core lead: Linda A. McCauley PhD, RN, FAAN, FAAOHN

The C-CHEM<sup>2</sup> COTC is building upon strong, preexisting partnerships within the Atlanta environmental health community to share research findings with local communities in a format that is relevant, accessible, and culturally-appropriate. The COTC is guiding scientists in community outreach and translation and expanding bi-directional dialogue with metropolitan African American women of childbearing age and their families. The core is also developing innovative strategies to translate research findings into practical information that African American families can use to protect their children's health and is integrating this knowledge into educational programs for health-care professionals.

Learn more about the Center:

<http://www.nursing.emory.edu/c-chem2/index.html>

### **Application Timeline and Instructions:**

- Application packets are due February 28<sup>th</sup> 2018.
- Awards will be announced March 9<sup>th</sup>.
- Students must confirm acceptance and participation in program by March 12<sup>th</sup>.
- All items are to be scanned and emailed to Nathan Mutic at [nathan.mutic@emory.edu](mailto:nathan.mutic@emory.edu).
- List "C-CHEM<sup>2</sup>-SURI-Last Name" in the subject line of your email.
- Incomplete applications will not be reviewed.
- Include the following items in your email submission:
  - Completed C-CHEM<sup>2</sup>-SURI 2018 application page.
  - One page essay describing how your involvement in this program will support your long-term academic and career goals.
  - One letter of recommendation from a recent professor or supervisor
    - Sealed letters can be mailed to the following address if not available to scan:  
Nathan Mutic, Rm 411  
Emory University School of Nursing  
1520 Clifton Rd NE  
Atlanta, GA 30322
  - College transcript (copies of official transcripts are acceptable)
  - Resume (two page maximum)

**Eligibility and Requirements:**

- Undergraduate student in good standing at Emory University.
- Ability to commit to 10 week summer program at 40 hours per week.
- Any known conflicts must be clearly outlined in the application. The start and end dates may be modified at the center investigators discretion to accommodate for pre-existing or unforeseen scheduling conflicts.
- As this is a full time paid summer commitment, interns are not permitted from holding jobs or having other academic obligations such as course work during the internship. In rare instances exceptions can be made at the discretion of the mentor.

**Center for Children's Health, the Environment, the Microbiome, and Metabolomics (C-CHEM<sup>2</sup>)  
 Summer Undergraduate Research Internship (SURI)  
 2018 Application Page**

Applicant Information	
Name:	Email:
Student ID number:	Phone:
Major:	Department:
School:	GPA:
Home Address:	
Emergency Contact Information	
Name:	Relationship:
Phone:	Email:
Address:	

List any previous honors/awards and a brief description of the award:

Award	Date	Description

If selected for the C-CHEM<sup>2</sup>-SURI program I will commit to participating in 10 weeks of full time (40 hours per week) research during the 2018 summer semester. I hereby give permission to the C-CHEM<sup>2</sup>-SURI selection committee to review my transcripts and application materials.

Student Signature: \_\_\_\_\_

Date: \_\_\_\_\_