

# YOUR HEALTH & THE ENVIRONMENT



NEWS FROM THE UNIVERSITY OF ROCHESTER ENVIRONMENTAL HEALTH SCIENCES CENTER

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## UNIVERSITY LAUNCHES INSTITUTE FOR HUMAN HEALTH AND THE ENVIRONMENT TO FIND SOLUTIONS TO THE 21ST CENTURY'S MOST PRESSING HEALTH ISSUES

The University of Rochester recently launched its Institute for Human Health and the Environment (IHHE) ([insert link to web site](#)). The vision of the IHHE is to help find solutions to the 21st Century's most pressing health issues – including cancer, heart disease, neurodegenerative disorders, and our ability to fight infection – through a collaborative commitment to research, education, and community engagement related to how the environment influences health across the lifespan. The new UR IHHE will bring this vision to life by complementing and building on decades of research and engagement through the Environmental Health Sciences Center, Toxicology program, and related efforts across the entire University.

“The University has been a leader in research and education in environmental health and toxicology since the 1940s, so we’re building off an extremely strong foundation,” said EHSC Center Director B Paige Lawrence, the Wright Family Research Professor and chair of the department of Environmental Medicine. “Many teams are already conducting research, teaching, and working with community members on issues related to the environment and health, but we know we can do more. It is exciting to launch this new institute and engage new faculty, staff, trainees, and partners from across the University and community in environmental health.”

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## Institute of Human Health and the Environment

The IHHE will integrate programs and expertise from across all UR schools and will be anchored by three interactive pillars: Research; Career Development and Education; and Engagement. Initially, the Institute's key areas of focus will include climate change and health; environmental justice; how water and air pollution impact health; and how environmental factors shape health across the whole lifetime.

To learn more about the Institute, visit the IHHE web site:

<https://www.urmc.rochester.edu/institute-for-human-health-and-the-environment.aspx>

## Center Member Highlighted by NIEHS



**Ray Dorsey, MD, MBA**

**Center member Ray Dorsey, MD, MBA, David M. Levy Professor of Neurology and Director of the Center for Health + Technology at the University of Rochester Medical Center, was interviewed by NIEHS Director Rick Woychik in the Dec. 2022 Environmental Factor newsletter with a clip of the “Director’s Corner” .**

**To listen follow the link**

**[https://factor.niehs.nih.gov/2022/12/feature/4-feature-parkinsons-disease/index.htm?utm\\_source=efactor-newsletter&utm\\_medium=email&utm\\_campaign=efactor-newsletter-2022-December](https://factor.niehs.nih.gov/2022/12/feature/4-feature-parkinsons-disease/index.htm?utm_source=efactor-newsletter&utm_medium=email&utm_campaign=efactor-newsletter-2022-December)**

## Dr. Sally Thurston recognized for Excellence in Postdoctoral Mentoring

Dr. Sally W. Thurston received the 2022 Excellence in Postdoctoral Mentoring Award at the School of Medicine and Dentistry Awards and Philosophy Meeting on September 13, 2022. This annual award is given to one faculty member to recognize their dedication to postdoctoral trainees and their significant contributions to the career development and professional advancement of postdoctoral trainees.

Dr. Thurston was nominated by her postdoctoral fellow, Dr. Sima Sharghi, who wrote "Even writing this letter makes me so emotional, describing the level of support I have received from this woman. Sally is selfless! She is the best mentor, teacher, boss, and advisor I have EVER had. Sally is highly educated and knowledgeable of many areas of statistics, but she patiently waits for me to learn on my own speed. She pays attention to the details that I could easily miss...corrects my mistakes in the nicest manner...gives me space to be creative, and to learn how to collaborate with researchers from other universities. Because of Sally's manners and behavior towards me, I feel I belong."

One of Dr. Thurston's colleagues in Biostatistics also noted that a common theme in Dr. Thurston's work with students is her "selfless dedication and her amazing ability to inspire her mentees to believe in themselves."

To see more news follow the link [News - News & Events - Department of Biostatistics and Computational Biology - University of Rochester Medical Center](#)



**Sally Thurston, PhD**

## ECHO in Rochester

In 2016, NIH initiated the Environmental influences on Child Health Outcomes (ECHO) (<https://echochildren.org/>), a 7-year program of research to understand how environmental factors affect child health and development, with a particular focus on perinatal outcomes, neurodevelopment, obesity, and upper/lower airway disease/asthma. The program leverages a wealth of previously collected data from existing pediatric cohorts and supports ongoing standardized collection of biological and clinical data; the program also includes an extensive infrastructure to support collaborative research. ECHO is composed of both observational and intervention studies from 44 US states and Puerto Rico. The approximately 70 observational cohort studies are very diverse in terms of race, ethnicity, and sociodemographic settings. The program was recently renewed by NIH for another 7 years.



**Tom O'Connor, PhD**

Center member Tom O'Connor, Wynne Distinguished Professor in the Departments of Psychiatry, Neuroscience, and Obstetrics and Gynecology, leads one of the ECHO awards that includes a cohort at Rochester (ECHO-UPSIDE: Understanding Pregnancy Signals and Infant Development) and a parallel cohort at the University of Pittsburgh/Magee-Womens Hospital. The ECHO award to Rochester brings together other scientists in the EHSC as well as many investigators and over a dozen PhD and post-doctoral students from nine departments in the Medical Center.

The Rochester cohort follows over 300 mothers from the first trimester of pregnancy to examine how prenatal experiences such as stress and anxiety, and prenatal biological factors such as inflammation and stress physiology, shape individual differences in child neurodevelopment, metabolic health and growth. The cohort has many innovative features, including a detailed interrogation of the placenta; longitudinal behavioral, neuroimaging, and neurocognitive assessments; and extensive immunological analyses of maternal and child samples.



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## ECHO in Rochester



The Rochester cohort has spawned many other projects, including the “UPSIDE-MOMS” project (Rochester investigators Drs. Groth, Barrett, O’Connor) that examines how biological changes in the perinatal period forecast maternal cardio-metabolic health in the postnatal period; the ECHO-Babies project (Rochester investigators Drs. Rich, Miller, O’Connor) that examines how prenatal exposure to air pollution alters maternal and placenta biology; the microbiome project (Rochester investigators Drs. Gill, Scheible, O’Connor) that investigates the mechanisms by which the child’s developing microbiome shapes neurodevelopment; and three NIEHS R01s from collaborating institutions that examine environmental exposures on the placenta and prenatal maternal biology.

Data from the Rochester UPSIDE cohort have contributed to dozens of ECHO publications and papers in progress on topics such as detection of novel and emerging chemicals in pregnant individuals; disparities in micronutrients and other health markers in pregnancy; and the impact of COVID-19 on pediatric obesity. The Rochester team are busy collating data from early pregnancy through early childhood and merging their data with other cohorts across the US to serve the ECHO mission of enhancing the health of children for generations to come.

Text adapted from:

<https://www.urmc.rochester.edu/psychiatry/research/wynne-center/research-projects/echo.aspx>

<https://echochildren.org/pediatric-cohorts/>

<https://reporter.nih.gov/project-details/9726471>

For more information on ECHO, see: <https://www.nature.com/articles/s41390-021-01574-8>

## Welcome to New EHSC Members

The EHSC has welcomed six new members in 2022, including Danielle Alcéna-Stiner, PhD, RN, Ray Dorsey, MD, MBA, Ehsan Hoque, PhD, Scott McIntosh, PhD, Karen Wilson, MD, MPH, and Collynn Woeller, PhD. Here we introduce three of these new Center members.



**Danielle Alcéna-Stiner, PhD, RN**

### **Danielle Alcéna-Stiner, PhD, RN**

Danielle Alcéna-Stiner, PhD, RN, is an Assistant Professor in the School of Nursing at the University of Rochester Medical Center (URMC). Dr. Alcéna-Stiner also holds a Visiting Faculty appointment at Yale University through her Research Education Institute for Diverse Scholar (REIDS) Fellowship.

Dr. Alcena-Stiner, who was previously the assistant director of the Life Sciences Learning Center (LSLC) in the Environmental Health Sciences Center, partners across interdisciplinary community and research networks to incorporate immunology, infectious disease research, nursing science, and community engagement into her research investigations.

Her aim is to bring bench biology beyond the bedside and into applied health literacy and behavior change for health promotion and wellness.

Her emerging program of research is guided by community stakeholder input, validated educational curricula, and evidence-based practices. To this end, Dr. Alcéna-Stiner continuously seeks partnerships for a multidisciplinary approach to investigate biological, social, and environmental factors influencing adolescent health promotion. Her goal is to partner with community and research networks to develop and implement infectious disease health literacy interventions, with the purpose of reducing health disparities among adolescents as they transition into adulthood.

## Welcome to New EHSC Members



**Karen Wilson, MD, MPH**

### **Karen Wilson, MD, MPH**

Dr. Wilson is the Ruth A. Lawrence Professor and Vice-Chair for Clinical and Translational Research in the Department of Pediatrics at the University of Rochester School of Medicine, the Chief Research Officer of the UR Medicine Golisano Children's Hospital, as well as the Strategic Director for the Research Services Branch of the UR Clinical and Translational Sciences Institute, and the Co-Director of the CTSI's KL2 program. Dr. Wilson was at the University of Rochester for all of her training and as a junior faculty member. After holding several positions at other institutions, she returned to Rochester 2021.

Dr. Wilson has more than 20 years of experience in environmental health, researching the impact of secondhand tobacco smoke exposure on children, tobacco smoke exposure in multi-unit housing, and how to help parents quit smoking. More recently, she has developed a research program in secondhand marijuana smoke exposure, and has called attention to concerns over children's exposure with increased legalization. Dr. Wilson has had an R01 from NCI to study an inpatient parent smoking cessation intervention, and she is one of the Principal Investigators of the American Academy of Pediatrics (AAP)/Julius B. Richmond Center of Excellence. She is the Chair of the AAP's Tobacco Consortium. In addition, Dr. Wilson is the Chair of the Pediatric Research in Inpatient Settings (PRIS) Network Executive Council, and is the Chair of the American Board of Pediatrics' Pediatric Hospital Medicine Sub-board. She is also an Associate Editor for Nelson's Textbook of Pediatrics, and the Deputy Editor of Hospital Pediatrics.

Prior to returning to Rochester, Dr. Wilson held a faculty position at Mt. Sinai, where she was co-investigator on a pilot project supported by the NIEHS Transdisciplinary Center on Early Environmental Exposures. At Rochester, she looks forward to collaborating with other EHSC members on projects that build on her work to understand the impact of marijuana smoke on children.

## Welcome to New EHSC Members

### **Collynn Woeller, PhD**

Collynn Woeller, PhD is an Assistant Professor of Ophthalmology with secondary appointments in the Department of Environmental Medicine and the Center for Visual Science. Dr. Woeller's research focuses on understanding the molecular mechanisms driving inflammation and tissue remodeling in and around the eye.



**Collynn Woeller, PhD**

Currently, his laboratory is studying how sentinel cells called fibroblasts facilitate tissue remodeling in Thyroid Eye Disease (TED). TED occurs in up to half of all patients with Graves' disease, a common autoimmune disorder that leads to hyperthyroidism. It is not known why only half of Graves' patients exhibit eye disease; however, cigarette smoking increases the chances of developing TED by 8-fold.

The Woeller lab hypothesizes that smoke and other environmental exposures play a critical role in the development of TED by disrupting aryl hydrocarbon receptor (AhR) signaling. The AhR is a widely expressed protein that was originally identified as an environmental sensor that binds organic pollutants such as dioxin and other compounds found in cigarette smoke. The AhR also binds natural hydrocarbons generated in the body that help maintain the immune system and cell growth. The lab is trying to understand how changes in the timing and make-up of AhR activating compounds may contribute to TED. The lab also aims to target the AhR pathway therapeutically to limit excessive tissue remodeling in TED.

Woeller grew up in Skaneateles, New York and attended SUNY Geneseo and Cornell University before coming to the University of Rochester. During his PhD, he investigated the regulation of genes involved in folic acid metabolism and cell proliferation. Some of his work during his post-doctoral studies focused on how a brominated bisphenol-A derivative (TBBPA) used in plastics and as a flame retardant, altered microRNA expression in human stem cells to influence cell fate. Woeller is excited to continue studying how environmental exposures alter cell behavior and influence eye disease.



## A One-Two Punch: Low Levels of Coffee Roasting Chemical and Mild Flu May Damage Lungs

Center Member Matthew D. McGraw, M.D. recently published a study that found that even short-term exposures to diacetyl can damage the lungs of mice when paired with a second insult, like the flu.

It is well known that chronic exposure to high levels of the flavoring chemical diacetyl, which is found in many foods and beverages, can cause lung damage. Diacetyl, which gives microwave popcorn its buttery flavor, was first linked to flavorings-related lung disease in the early 2000's when a group of former microwave-popcorn factory workers were diagnosed with bronchiolitis obliterans, an uncommon but severe lung disease often called "popcorn lung." More recently, a similar lung disease has been seen among coffee roasters who inhale large concentrations of diacetyl, which is a natural byproduct of the coffee roasting process.

While coffee roasters workers in prior studies inhaled high levels of diacetyl over long periods of time, the URM study published in the *American Journal of Physiology – Lung Cellular and Molecular Physiology* set out to test whether low-level, short-term exposures to the same chemical could produce a similar effect in an animal model.

"We found that a single exposure to diacetyl for short periods of time did not result in much lung damage," said lead study author McGraw, who is an assistant professor of Pediatric Pulmonology at URM. "But when mice are exposed to another common environmental exposure, like flu, the double hit can cause airway disease similar to what we see with high-dose, long-term exposures to diacetyl."



**Matthew McGraw, MD**

## One-Two Punch (continued)

In the study, which was supported by a pilot grant from the URM Environmental Health Science Center and a Career Development Award from the UR Clinical and Translational Science Institute, mice were exposed to diacetyl for one hour a day over five consecutive days at levels similar to what coffee roasters encounter at work. Mice were then exposed to influenza A, which typically causes seasonal flu in humans.

Within two weeks of exposure, more than half of the mice that received this one-two hit died, while all of the mice in the control groups (exposed to diacetyl alone, flu alone, or neither) survived. Lungs from mice exposed to the 'two-hits' showed significant impairment of lung function and airway repair compared to controls.

Researchers then switched the order of exposure, infecting another group of mice with flu first, allowing them to recover for nine days, then exposing them to diacetyl for five days. Whether the mice were exposed to diacetyl before or after flu, their lungs were unable to fully heal, again suggesting that exposure to both chemical and virus leads to abnormal airway repair.

"Our study shows that common environmental exposures that seem harmless on their own can have very serious impacts on lung function and long-term respiratory health when combined," McGraw said.

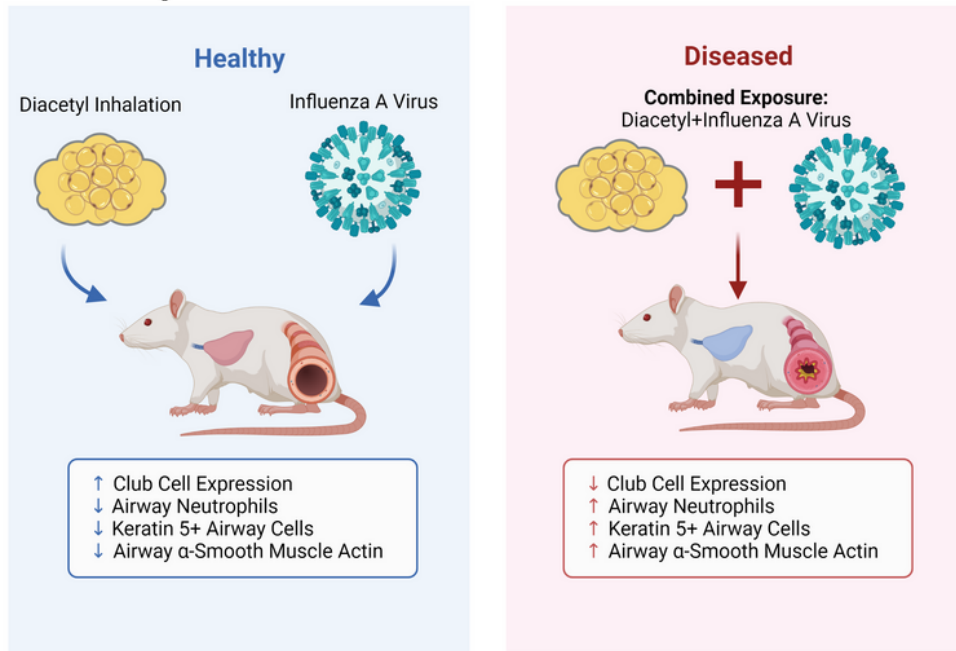
While further research is needed to understand the impacts of low levels of diacetyl on humans, this study could have implications for people who are exposed to diacetyl at work, like coffee roasters. Currently, McGraw's team is conducting a study in mice to see how long after a flu infection it is safe to be exposed to diacetyl, which could help inform when coffee roasters can safely return to work after having the flu.

McGraw shared this work with the EHSC Community Advisory board in December 2022, asking for input on how best to share this work with coffee roasters and interested others in our region. In the future, the research team hopes to collaborate with community partners to spread awareness of the risks of diacetyl exposure, assess existing exposures, and explore potential mitigation approaches.

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## One-Two Punch (continued)

### Diacetyl Inhalation Impairs Airway Epithelial Repair in Mice Infected with Influenza A Virus



Other authors of the American Journal of Physiology – Lung Cellular and Molecular Physiology study include Michael A. O’Reilly, Ph.D., professor of Pediatrics; B. Paige Lawrence, Ph.D., chair and professor of Environmental Medicine; Andrew M. Dylag, M.D., associate professor of Pediatrics; Min Yee, a technical associate in the O’Reilly lab; and So-Young Kim, M.S., a technician in the McGraw lab.

**This project was supported by a pilot grant from the URM Environmental Health Science Center under grant number P30 ES001247 from the National Institute of Environmental Health Sciences and by the University of Rochester CTSA award number KL2 TR001999 from the National Center for Advancing Translational Sciences.**

**Adapted from URM Communications:**

**<https://www.urmc.rochester.edu/news/story/a-one-two-punch-low-levels-of-coffee-roasting-chemical-and-mild-flu-may-damage-lungs>**

## New Toxicology Training Program Students

### **Jithin George**

**Hometown:** Newtown, PA

**Education Background:**

- B.S. in Neuroscience & Biomathematics from the University of Scranton
- Current MD/PhD student at the University of Rochester School of Medicine and Dentistry



**Jithin George**

### **Alma Avila Oropeza**

**Hometown:** San Diego, California

**Education Background:**

- B.S. in Biochemistry from California State University San Marcos



**Alma Avila Oropeza**

### **Knickole Bergman**

**Hometown:** Jefferson, MD

**Education Background:**

- B.S. in Molecular Biology from Towson University



**Knickole Bergman**

### **Pablo Reina-González**

**Hometown:** San Juan, Puerto Rico

**Education Background:**

- B.S. in Biology from Hamilton College
- B.A. in Women's and Gender Studies from Hamilton College



**Pablo Reina-González**



## **For Questions or Comments, Please Contact:**

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