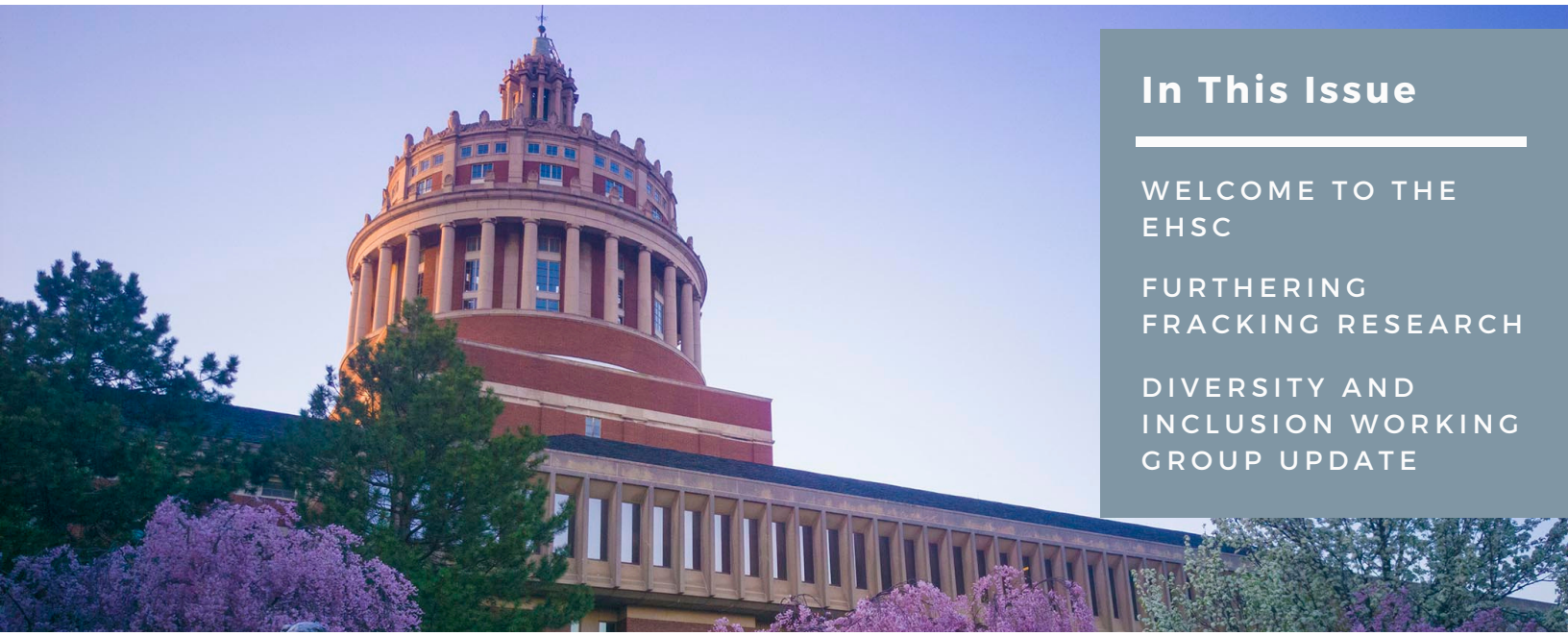
SPRING 2021

YOUR HEALTH & THE ENVIRONMENT

NEWS FROM THE UNIVERSITY OF ROCHESTER ENVIRONMENTAL HEALTH SCIENCES CENTER



In This Issue

WELCOME TO THE EHSC

Hae-Ryung Park, PhD is our newest Assistant Professor in the Department of Environmental Medicine, and is also a member of the Environmental Health Sciences Center. She received her PhD in Toxicology from the University of Michigan with a specialization in reproductive toxicology. She completed her postdoctoral fellowship at Harvard University's School of Public Health, where she used functional genomics/genetics tools to study mechanisms of metal neurotoxicity. Park's current research combines her graduate and post-graduate training to focus on how environmental exposure impacts early brain development, with a particular interest in the novel roles of the placenta.

Park's research utilizes a myriad of molecular, cellular and biochemical approaches. For example, using a genome-wide CRISPR screen, she identified novel suppressors of arsenic -induced endoplasmic reticulum stress including microRNA(miR)-124.[1] MiR-124 is a highly expressed miRNA in the brain and it regulates genes involved in neuronal function. Park further showed that miR-124 protects against arsenic toxicity in human neural cells and its genetic polymorphisms are associated with neurodevelopmental outcomes in children (Park et al., 2020, Scientific Reports). This research is supported by an R00 grant from NIEHS, entitled, "microRNA, ER Stress, and Arsenic Neurotoxicity." She plans to further investigate the roles of miR-124 in the regulation of arsenic toxicity and neural stem cell function.

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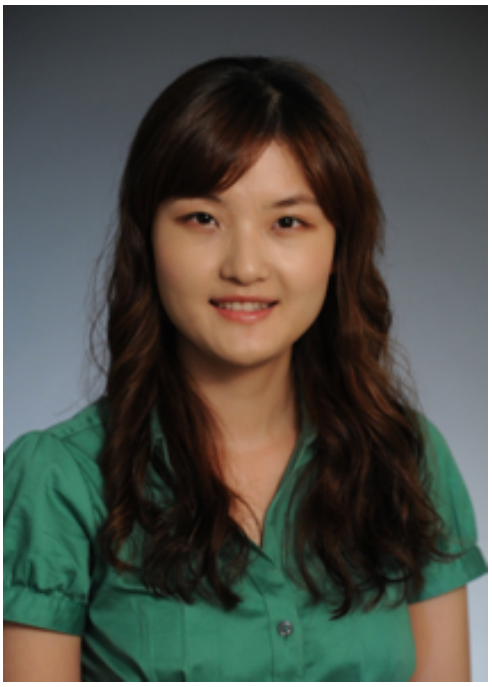
Welcome to the EHSC

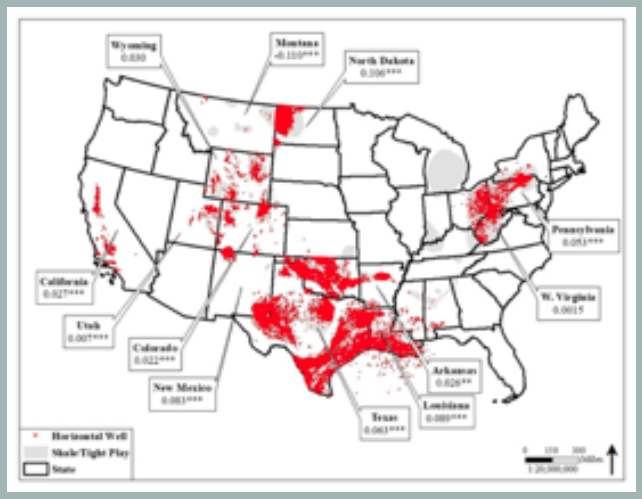


More recently, Park has focused on fetal neuroprogramming as a result of the inter-relationships between neurotoxicants and the placenta. Placental trophoblast cells actively release extracellular vesicles (EVs) into the maternal and the fetal circulation. The EVs shuttle cargoes of bioactive molecules, such as proteins, lipids, and nucleic acids, from trophoblasts to the recipient cells, modifying gene expression and biology in the cells. Park is investigating how environmental exposure affects the production, release and/or cargoes of placental EVs and how this leads to differential regulation of neural stem cell function.

[1] Panganiban, R., Park, H.-R., Sun, M., Shumyatcher, M., Himes, B., & Lu, Q. (2019). Genome-wide CRISPR screen identifies suppressors of endoplasmic reticulum stress-induced apoptosis. Proceedings of the National Academy of Sciences of the United States of America, 116(27), 13384-13393. https://doi.org/10.1073/pnas.1906275116

Furthering Fracking Research

EHSC researchers have contributed to the literature on the potential human health effects of unconventional natural gas development (also referred to as hydraulic fracturing or fracking). Fracking involves injecting chemicals at high pressure into subterranean bedrock in order to extract natural gas. Since the first fracking-related paper by a Center member in 2014, EHSC researchers from multiple disciplines have continued to advance this field.[1] For example, Center Director B. Paige Lawrence, PhD, and Center Members Jacques Robert, PhD, and Steve Georas, MD, have collaborated on several studies on how fracking-associated pollutants affect the immune system. Most recently, Lawrence and Roberts contributed to a review of endocrine-mediated effects of chemicals commonly used in fracking.[2, 3, 4] Robert is also the director of the NIH-funded Xenopus laevis Research Resource for Immunology that is the world's most comprehensive resource specializing in the use of the amphibian Xenopus laevis for immunological research, including immunotoxicity.



Estimated increases in light pollution across the US (E. Hill, PhD)

Xenopus laevis (J. Robert, PhD)

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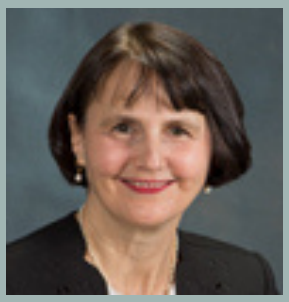
Furthering Fracking Research



Paige Lawrence, PhD

Jacques Robert, PhD

Steve Georas, MD

Elaine Hill, PhD

Center member Elaine Hill, PhD, has a longstanding interest in the health effects of fracking. Since her groundbreaking doctoral work - one of the first studies to show human health effects associated with proximity to fracking - she has continued to explore this issue. As an economist, she develops models combining geographically-linked data on health outcomes with natural gas extraction activities. Her most recent publication reports on a collaborative effort that found links between pediatric asthma rates and both unconventional and conventional drilling exposures.[5] In other forthcoming work, her team has found reduced sleep and self-reported well-being with increased light pollution associated with unconventional drilling and links between increased rates of acute myocardial infarction (AMI) hospitalizations and unconventional drilling comparing PA to NY where unconventional drilling is banned.[6,7]

Continued from page 4

Furthering Fracking Research

Citations:

1. Korfmacher, K.S., S. Elam, K. Gray, E. Haynes, M. Hughes. 2014. Unconventional Shale Gas Development and Public Health: Toward a Community-informed Research Agenda. Review of Environmental Health. 29(4):293-306. PMID: 25204212.
2. Boule L., Chapman T., Hillman S., Balise V., O'Dell C., Robert J., Georas S., Nagel S., and Lawrence P. (2017). Developmental exposure to a mixture of 23 chemicals associated with unconventional oil and gas operations alters the immune system of mice. Tox Sci. 163:639-54. PMCID: PMC5974794
3. Robert J, McGuire CC, Kim F, Nagel SC, Price SJ, Lawrence BP, De Jesús Andino F. "Water Contaminants Associated With Unconventional Oil and Gas Extraction Cause Immunotoxicity to Amphibian Tadpoles." Toxicological sciences: an official journal of the Society of Toxicology. 2018 Nov 1; 166(1):39-50.
4. Robert J, McGuire CC, Kim F, Nagel SC, Price SJ, Lawrence BP, De Jesús Andino F. "Water Contaminants Associated With Unconventional Oil and Gas Extraction Cause Immunotoxicity to Amphibian Tadpoles." Toxicological sciences : an official journal of the Society of Toxicology. 2018 Nov 1; 166(1):39-50.
5. Robert J., McGuire C., Kim F., Nagel S., Price S., Lawrence P., and De Jesus, Andino F. (2018).Developmental exposure to chemicals associated with unconventional oil and gas extraction alters immune homeostasis and viral immunity of the amphibian Xenopus. Science of the Total Environment 671:644-654. DOI: 10.1016/j.scitotenv.2019.03.395 PMCID: PMC6533627
6. Nagel SC, Kassotis CD, Vandenberg LN, Lawrence BP, Robert J, Balise VD. "Developmental exposure to a mixture of unconventional oil and gas chemicals: A review of effects on adult health, behavior, and disease." Molecular and cellular endocrinology. 2020 Mar 2; :110722. Epub 2020 Mar 02.
7. Mary Willis, Perry Hystad, Alina Denham, Elaine Hill, Natural gas development, flaring practices and paediatric asthma hospitalizations in Texas, International Journal of Epidemiology, , dyaa115, https://doi.org/10.1093/ije/dyaa115
8. Boslett, A., Hill, E., Ma, L., & Zhang, L. (2021). Rural Light Pollution from Shale Gas Development and Associated Sleep and Subjective Well-Being. Resource and Energy Economics, 101220.
9. Denham, A., Willis, M. D., Croft, D., Liu, L., & Hill, E. L. (2021). Acute Myocardial Infarction Associated with Unconventional Natural Gas Development: A Natural Experiment. Environmental Research, 110872.

Deborah Cory-Slechta, PhD Receives Prestigious Award from SOT

Deborah Cory-Slechta, PhD has been named the 2021 Distinguished Toxicology Scholar by the Society of Toxicology. Cory-Slechta is Professor of Environmental Medicine, Pediatrics, and Public Health Sciences and serves as Deputy Director of the Environmental Health Sciences Center. This award recognizes Cory-Slechta as a pioneer in behavioral toxicology for her many accomplishments including her ground-breaking research recognizing that stress modifies lead (Pb) toxicity and that air pollution targets the developing brain.

More about this award and Cory-Slechta's achievements may be found at: https://www.toxicology.org/awards/sot/recipients2021.asp.

Deborah Cory-Slechta, PhD

Inhaled Paraquat Enters Brain, Impairs Sense of Smell in Male Mice

A recent publication by the Cory-Slechta lab reported that inhalation of the widely used pesticide paraquat reduced the sense of smell in male mice for several months after exposure. Loss of sense of smell, or olfactory impairment, is an early sign of Parkinson's disease.

The researchers also found that paraquat entered the brain and other tissues.

Environmental Health Sciences Center researchers modeled inhalation of low concentrations of paraquat using the Inhalation Core facility to expose mice to aerosolized paraquat. The team then measured levels of the pesticide in lung, kidney, and four regions of the brain — olfactory bulb, striatum, midbrain, and cerebellum.

"Inhalation can provide a direct route of entry to the brain," explained doctoral student Timothy Anderson, MS. "If you inhale something and it goes into your nose, it can actually enter the neurons responsible for sense of smell, and travel into the brain."

> *"If you inhale something and it goes into your nose, it can actually enter the neurons responsible for sense of smell, and travel into the brain."*
>
> — TIMOTHY ANDERSON, MS

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Inhaled Paraquat Enters Brain, Impairs Sense of Smell in Male Mice

Anderson is a fourth-year graduate student in lab of Deborah Cory-Slechta, Ph.D., where the study was conducted. Co-author Kevin Welle measured the highest brain levels in the olfactory bulb, suggesting paraquat entered the brain through nasal-olfactory neurons. The effects were only seen in males, and lingered as long as 200 days post-exposure, even though paraquat was no longer detected in the brain.

The findings, published Dec. 29, 2020, in the journal Toxicological Sciences, suggest that paraquat may contribute to neurodegenerative diseases and underscore the importance of studying the effects of inhaled neurotoxicants.

The article was adapted from an article by fourth-year graduate student Ashley Peppriell in Environment Factor, National Institute Environmental Health Sciences Center newsletter.[1]

Citations:

1. Peppriell, A. (2021, February). Inhaled paraquat enters brain, impairs sense of smell in male mice. Environmental Factor (NIEHS).

Rand Lab Publishes Trio of Papers on Methylmercury Myotoxicity

By Ashley Peppriell, MS

Back-to-back publications this fall set the tone for the future of methylmercury (MeHg) myotoxicity. The Rand lab found additional ways that MeHg targets developing muscle in a fruit fly and collaborated with the Cory-Slechta lab to evaluate the translational relevance to mammalian systems.

People have known for decades that the developing nervous system is sensitive to the environmental toxicant, MeHg, and that exposure can lead to cognitive and motor impairments. But to what extent is the developing muscle sensitive to MeHg to contribute to the motor deficits? For Dr. Matthew Rand, that was the big question. Rand explained that “motor deficits are a prominent clinical feature stemming from MeHg exposure, as seen in both historical poisoning cases and epidemiological studies, yet they have conventionally been attributed solely to a neurological cause.”

Jakob Gunderson, MS and Ashley Peppriell, MS

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In the past year, the Rand lab has published three papers that support muscle-specific effects of MeHg.[1,2,3] Fourth-year graduate students Ashley Peppriell and Jakob Gunderson are lead authors on the two most recent papers for the project. The students demonstrated that MeHg perturbs early formation of Drosophila flight muscles, which give rise to muscle pathology and reduced neuromuscular abilities, including flight.

The students found it interesting that larval exposure to MeHg manifests as adult-specific deficits in flight ability. Exploring this as it relates to disturbed muscle-tendon attachments is a component of Ashley's thesis work. Jakob's project focuses on how an inherent anti-oxidant response to MeHg in developing muscle modulates muscle-neuron communication. He has observed that enhancing an intrinsic protective mechanism in muscle during development can ameliorate later life neuromuscular impairments caused by MeHg. The duo often put their heads together to understand MeHg myotoxicity, a less travelled avenue of toxicology research.

Collaborations in the Rand lab extend beyond the bench and down the stairs to the Cory-Slechta lab and behavior core, which evaluates sensitive behavior endpoints in mice and other animals. "By virtue of the diverse research strengths of our Center colleagues we are immediately able to translate our finding in flies to mice and to humans," said Rand.

Rand and Cory-Slechta collaborated to evaluate motor deficits in mice following a maternally derived developmental MeHg exposure. The team's recent report in Neurotoxicology demonstrated male-specific neuromuscular deficits in the offspring well into adulthood. Furthermore, the team observed that more mercury accumulated in muscle relative to blood and brain. Despite the buildup, and in contrast to what happens in the flies, the muscle tissue in adult mice appeared normal before behavioral testing.

The Rand lab plans to take the investigation to a higher resolution analysis of the neuromuscular and musculoskeletal targets of MeHg. The next step is to evaluate whether MeHg affects how the developing muscle connects with either partnering neuron versus tendon – or a combination of the two.

The trio of recent papers is an exciting step forward for the Rand lab and contributes key information to the emerging field of methylmercury myotoxicity.

Ashley Peppriell, MS, is a fourth year gradate student in the University of Rochester toxicology training program who aspires to a career in science writing.

Continued from page 10

Citations:

1. Peppriell, A. E., Gunderson, J. T., Vorojeikina, D. & Rand, M. D. Methylmercury myotoxicity targets formation of the myotendinous junction. Toxicology 443, 152561, doi:10.1016/j.tox.2020.152561 (2020).
2. Gunderson, J. T., Peppriell, A. E., Vorojeikina, D. & Rand, M. D. Tissue-specific Nrf2 signaling protects against methylmercury toxicity in Drosophila neuromuscular development. Arch Toxicol, doi:10.1007/s00204-020-02879-z (2020).
3. Rand, M. D. et al. Developmental exposure to methylmercury and resultant muscle mercury accumulation and adult motor deficits in mice. Neurotoxicology 81, 1-10, doi:10.1016/j.neuro.2020.07.007 (2020).

Diversity and Inclusion Working Group Update

The Department of Environmental Medicine launched a new Diversity and Inclusion Working Group (DIWG) in June 2020, comprised of faculty, staff, students and fellows. Center Director Paige Lawrence, PhD, asked the DIWG to examine issues from multiple perspectives and to candidly report back what they learned. The group took a collaborative approach to evaluating how to foster a more supportive, inclusive and diverse working and learning environment. Over three months, the DIWG sought informal feedback, connected with other groups inside and outside the University, and administered a survey to the entire Department of Environmental Medicine community.

In October 2020, the DIWG summarized its findings and recommendations in a report suggesting actions to be taken in five priority areas:

- Priority 1. Sustaining Progress, Accountability, and Transparency – Actions to establish a structure for implementing current and future efforts to improve diversity and inclusion.
- Priority 2. Culture and Behavioral Change – Actions to improve interpersonal interactions and create an environment where everyone feels safe and welcome.
- Priority 3. Learner Diversity, Support, and Training – Actions to create a diverse and inclusive training environment by increasing learner diversity and supporting diverse trainees according to their needs.
- Priority 4. DEM Workforce Training and Increased Diversity – Actions to promote an inclusive recruitment and hiring process, advance D&I education and training, and promote inclusion and representation in environmental health sciences research.
- Priority 5. Reduce Environmental Health Disparities – Actions to enhance equity outside the University, including the local community, professional societies, and policies.

The DIWG continues to meet monthly to prioritize, support, and track diversity and inclusion efforts. Meanwhile, the University of Rochester Medical Center has adopted and is actively implementing an Anti-Racism Plan. One of the DIWG's priorities is to promote two-way communication between departmental and university-wide efforts.

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Environmental Medicine Diversity and Inclusion Working Group Members:
(Top Left to Right) Anthony Franchini, Cait Fallone, and Marissa Sobolewski. (Middle Left to Right) Jakob Gunderson, Elizabeth (Lizzie) Williams- Velasquez, and Jasmine Reed. Bottom Left to Right) Kadijah Abston and Katrina Korfmacher. (Missing) Thivanka Muthumalage.

For example, CEC Director Katrina Smith Korfmacher, PhD and staff member Elizabeth Velazquez-Williams have been appointed as the department's Diversity and Inclusion Officers. Korfmacher and Center member Marissa Sobolewski, PhD serve on the URMC Health Equity Research Task Force, which is a critical part of the University's Anti-Racism Plan.

Students and faculty within the EHSC have already moved forward in several priority areas. For example, students developed a "Guide to Interviewing" for applicants to the Toxicology Training program who may not have access to mentoring or guidance in what to expect in a graduate program interview experience. They also produced a short video tour of Rochester highlighting its cultural diversity. Prior to interacting with interviewees, they participated in a discussion with Korfmacher about the relevance of Center research to addressing health inequities and ways to enhance, highlight, and communicated these connections. In addition, several Center faculty have rewritten their lab websites to highlight the health equity implications of their research or add personal statements on diversity, equity and inclusion. Sobolewski has initiated a new graduate course on Social Determinants of Health, which she is teaching this Spring. Updates on these initiatives and future directions are discussed among faculty at monthly EHSC meetings as well as at regular student and staff meetings.

For more information, see: https://www.urmc.rochester.edu/environmental-medicine/diversity-and-inclusion.aspx

Community Engagement Updates

As noted in our Summer 2020 newsletter (https://www.urmc.rochester.edu/environmental-health-sciences/community-engagement-core/resources.aspx), the Community Engagement Core has adapted to meet community needs during the pandemic in several ways, including:

- Remotely convening community partnerships like the Rochester Healthy Home Partnership to support coordination among local groups.
- Developing low-literacy fact sheets and infographics to encourage chemical safety in household cleaning and disinfecting.
- Adapting delivery and disseminating hands-on Science Take-Out kits as a remote education tool for local and national partners
- Initiating a working group of community stakeholders to learn about the potential of wastewater coronavirus surveillance to inform public health responses to the pandemic and support local colleges that are sampling campus wastewater.
- Supporting community-led eviction prevention efforts with a focus on avoiding increased exposure to environmental health hazards in homes.

Our work on these issues has expanded over the past six months. The Rochester Healthy Home Partnership has provided an important forum for sharing information about reducing health risks from the looming 'eviction epidemic' (the City has estimated nearly 25% of tenants are behind on rent payment). The CEC worked with partners to develop an infographic for tenants on working with their landlord to get needed repairs done to reduce health risks and help them quality for government rent assistance and organized a panel on the topic for URMC Public Health Grand Rounds. Free Science Take-Out kits have been offered to informal environmental educators as part of an effort to expand their environmental health capacity, provide interactive remote education, and create a local network of EE professionals. And, as described below, the wastewater surveillance working group convened by the CEC has blossomed into a regional effort to support local colleges' programs. The economic and community impacts of the pandemic will be long lasting. The CEC plan s to adapt our work and learn from our partners' innovations to respond to these needs over the long-term.

Wastewater surveillance for SARS-CoV-2: A Community Engaged Perspective

Although the virus that causes COVID-19 is not believed to survive long in wastewater, its RNA may be detected in sewage for days. Researchers all over the world are working hard to develop, standardize, and disseminate techniques for monitoring SARS-CoV-2 RNA in wastewater. This promising approach to monitoring trends in community infection rates may provide an early warning of increases at relatively low cost and independent of population testing rates.

Center member James McGrath, PhD and post-doc Greg Majewski, PhD, who had partnered on a previous EHSC pilot using their silicon nanomembrane technology to detect microplastics in the local water supply. They wondered if the nanomembranes could help to more quickly and cost-effectively isolate the viral RNA from wastewater. Korfmacher connected the researchers with local partners to obtain samples from the Monroe County wastewater treatment plant (WWTP). Not only did the WWTP staff willingly provide samples, but also they joined a working group convened by the CEC to explore the potential of wastewater surveillance and obtained CARES Act funding to test the county's wastewater for approximately six months (June-December 2020).

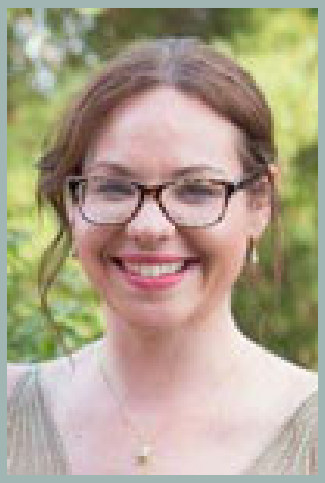
The "Monroe County Wastewater Coronavirus Surveillance Working Group" has continued to meet weekly since June, engaging over 30 members from county government environmental services and public health, state government, local colleges, and private sector companies. This group has supported development of wastewater surveillance at two local colleges and informed efforts at several additional institutions in the region. The CEC also serves as the hub for a 70-member listserv for colleges and universities across New York State. Korfmacher has shared the partners' work, collaborative structure, and lessons learned in a number of public presentations, most recently for a virtual "Science on the Edge" event through the Rochester Museum and Science Center.

Inspired by these powerful co-learning experiences, Korfmacher joined forces with a researcher at UC Berkeley to survey 25 U.S. colleges and universities about their wastewater monitoring practice. A preprint of their manuscript summarizing these institutions' experiences, lessons learned, and remaining knowledge gaps was recently released.

McGrath's EHSC pilot contributed to a larger project that helped launch Madejski's startup (paverio.com) and was recently published, with a community partner (Rowley) as co-author: Madejski, Gregory R., et al. "Silicon Nanomembrane Filtration and Imaging for the Evaluation of Microplastic Entrainment along a Municipal Water Delivery Route." Sustainability 12.24 (2020): 10655. https://www.mdpi.com/2071-1050/12/24/10655

New Project Will Study Environmental Hazards in Rochester Children's Homes

Katrina Korfmacher, PhD



Cait Fallone, MA

The U.S. Department of Housing and Urban Development (HUD) has awarded a $927,069 grant to a partnership between the Silent Spring Institute, the University of Rochester, the National Center for Healthy Housing, and the City of Rochester to study the impacts of home rehabilitation and resident engagement on exposures to harmful environmental chemicals within the home. This project builds on Rochester's nationally recognized lead poisoning prevention work to inform efforts to protect children and families from a wide range of home hazards.

The partners will work with the City of Rochester's highly successful Lead Hazard Control plus Healthy Homes program, which provides grants to low-income owner-occupants and landlords to address lead hazards in pre-1978 housing. The City of Rochester has received over $35 million in grant funding from HUD over the past 15 years to support lead hazard remediation in thousands of city homes.

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New Project Will Study Environmental Hazards in Rochester Children's Homes

This study will for the first time explore the potential of HUD-funded Lead Hazard Control grants to affect a wide range of other home-based exposures including pesticides, allergens, and endocrine disrupting chemicals such as flame retardants and phthalates. These chemical exposures contribute to a wide range of health concerns including asthma, learning disabilities, reproductive system problems, and cancer. The Lead Hazard Control grant program serves low-income families with young children, who are at particular risk from these environmental hazards.

The University of Rochester has partnered with community stakeholders and the City of Rochester for several decades to develop childhood lead poisoning prevention efforts that are widely recognized as a national model. The new project builds on this collaboration and extends it to broader environmental health concerns by working with Silent Spring Institute, a non-profit research organization that studies environmental chemical exposures that harm human health and educates communities on how to reduce their exposures. The team also includes the National Center for Healthy Housing (NCHH), a national non-profit group that conducts research and promotes policies to promote health equity through improved housing quality.

The research team expects that the findings will inform future HUD grant programs, policies, and practices to better protect children’s environmental health. Efforts to cost-effectively address home environmental health hazards are particularly important now, as children and families spend more time at home due to the pandemic and associated stay-at-home orders, as well as the economic challenges facing many families.

Toxicology Training Program Awards and News

Several of our trainees have received awards and accolades over the past year.

Predoctoral Students:

- **Ashley Peppriell** received the William F. and Margaret Neuman Award for exemplary scholarship and citizenship. Ashley is a 4th year student in Dr. Matt Rand's laboratory.
- **Timothy Anderson** was the recipient of the 2020 Weiss Toxicology Scholar Award. Tim is a 4th year graduate student in Dr. Deborah Cory-Slechta's lab.
- The Robert Infurna Award for outstanding first-author research publication by a doctoral student went to **Christina Post.** Christina's paper, published in 2019 in iScience, is titled "The ancestral environment shapes antiviral CD8+ T cell responses across generations." The co-authors are Lisbeth Boule, Catherine Burke, Colleen O'Dell, Bethany Winans, and B. Paige Lawrence.

In addition to these annual Program awards, several of the trainees were also recognized by the broader community in this last year.

- **Kadijah Abston** received the 2020 Elon Hooker Fellowship from the University of Rochester in recognition of her work under the mentorship of Dr. Xin Li.
- **Timothy Anderson's** novel work using an inhaled paraquat model in mice was highlighted a recent NIEHS online newsletter (Environmental Factor) in an article that was written by Ashley Peppriell, another current student.

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Toxicology Training Program Awards and News

While most regional and national conferences were cancelled in the last year due to the COVID pandemic, the students nevertheless participated in virtual conferences to present their work.

- **Alyssa Merrill** received the Best Graduate Student Abstract award from the Mixtures Specialty Section of SOT.
- **Emily Quarato** received a Short Talk Competition award at the 25th annual Wilmot Cancer Institute Scientific Symposium.
- **Ian Krout** won the 2nd place poster award at the Center for Professional Development/URBEST competition.
- **Ashley Peppriell** was elected as a councilor to the SOT Lake Ontario Regional Chapter and serves as the Chief Financial Officer for the School of Medicine and Dentistry Graduate Student Society.
- **Jasmine Reed** was selected to serve as an alumni mentor for the VA Tech PREP program.

This information was provided by the Toxicology Training Program Newsletter. For more information about awards and news, please contact Elizabeth Williams-Velasquez, Toxicology Graduate Program Coordinator at: Elizabeth_Williams-Velasquez@URMC.Rochester.edu

For Questions or Comments, Please Contact:

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