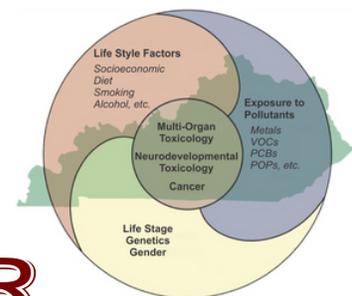


NEWSLETTER



CIEHS Up to Date News and Accomplishments

Awards Announcements and Reminders

CIEHS Pilot Project Awardee Spotlight: Dr. Natalie C. DuPré

Natalie C. DuPré, ScD, MS, received the CIEHS Interdisciplinary Pilot Project Award in 2020 entitled "Identifying Geographic Clusters and Environmental Correlates of Colorectal Cancer (CRC) in Kentucky". Learn about how Dr. DuPré became interested in Environmental Health, what her Pilot Project is researching and how her research is unique [HERE](#). Watch other CIEHS Pilot Project Awardee Spotlight videos [HERE](#).



Screenshot from CIEHS Pilot Project Awardee Spotlight video

WELCOME OUR NEW MEMBERS:

MOT RIG:

Jamie Young, Ph.D.

Cancer RIG:

Kyung Hong, Ph.D.

Did you know that you can apply for Small and IRB Preparation Assistance Research Vouchers throughout the year? Response to Reviewers (small) awards for up to \$1,500 will cover the costs associated with research needed to finish out a project or address questions arising in manuscript revisions or grant resubmissions. IRBP reparation Assistance (medium) awards for up to \$5,000 to cover costs associated with assistance in IRB preparation. Find out more information [HERE](#).

CIEHS IHSFC & OEFSC Voucher Awardees

Congratulations to investigators who were awarded [IHSFC](#) & [OEFSC](#) Voucher Awards!

Large IHSFC Research Voucher Award

Principal Investigator: Timothy O'Toole, PhD

Collaborator: Lu Cai, MD, PhD

Title: Metalomics of NEAT Cohort Samples

Lay Description: The inhalation of fine airborne particulate matter (PM2.5) is associated with a diverse array of cardiovascular, immunological, and neurocognitive disorders and contributes to increased mortality throughout the world. The Nucleophilic Defense Against PM Toxicity (NEAT) study, is an NIH-supported, double-blinded, clinical trial examining whether dietary supplementation with carnosine can mitigate the adverse effects of PM2.5. More than 250 participants will be enrolled in the NEAT study and randomized to receive placebo or carnosine tablets during the summer months when local PM2.5 levels are at their highest. During these study periods, we will collect blood and urine from study participants for the analysis of biomarkers indicative of pre-clinical vascular disease and will make direct assessments of vascular function, cognition and physical function as well. Funds supplied in this researcher voucher will support the NEAT study overall and will expand upon its goals and impact by allowing the quantitation of 23 metals in collected blood and urine samples. This is a here-to-fore unmeasured endpoint in our study, which may nevertheless be of importance given the role of environmental metals in impacting cardiovascular function, neurodegenerative disease, and frailty. Use of these funds in the NEAT study will enable a more rigorous characterization of local PM2.5 composition, provide insight into the mechanisms of PM2.5 toxicity, and assist in evaluating the potential therapeutic impact of dietary carnosine supplementation

Large OEFSC Research Voucher Award

Principal Investigator: J. Christopher States, Ph.D.

Collaborator: Lu Cai, MD, PhD and Alexandra Nail, PhD

Title: Disruption of Human MRN Complex Signaling by Heavy Metal Exposure

Lay Description: Heavy metals are common toxic environmental contaminants and exposure is widespread. Many are known to induce cancer in humans. Several metals such as arsenic and cadmium are known to induce chromosomal instability which plays a role in carcinogenesis. However, the mechanism is unknown. DNA double strand breaks are potentially lethal DNA damage and contribute to chromosomal instability. Our NIEHS funded project revealed that DNA damage signaling mechanisms were dysregulated in skin cells chronically exposed to arsenic. This research voucher expands on our prior work and focuses on the ability of arsenic and cadmium to disrupt the mechanism signaling the presence of DNA double strand breaks to the DNA repair and cell cycle regulatory systems.

CONNECT WITH US ON SOCIAL MEDIA:



Awards Announcements and Reminders Continued

Research!Louisville 2022

Thank you to everyone who participated in Research!Louisville for another successful year! Several awards were received by mentors of awardees. You can view these awards on [our website](#) or below (member names bolded). Also, thank you to everyone who showed support and attended the CIEHS Research Voucher Presentations and P30 Environmental Health Sciences Pilot Project Research presentations!

Master's Basic Science Graduate Student Award

1st Place: Caitlin Wilkerson

Mentor: **Walter Watson, PhD**

2nd Place: Oluwanifemi Esther Bolatimi

Mentor: **Matthew Cave, MD & Jamie Young, PhD**

Research Associate/ Research Scientist Award

Winner: Yiqun Mo

Mentor: **Qunwei Zhang, MD, MPH, PhD**

Public Health & Information Sciences

Masters Program: Olufunmilayo Babarinde

Mentor: **Natasha DeJarnett, PhD, MPH**

Basic Research: Yiqun Mo

Mentor: **Qunwei Zhang, MD, MPH, PhD**

Research & Practice: Johnnie Newton

Mentor: **Natalie DuPré, ScD, MS**

Doctorial Program: Damilola Owoade

Mentor: **Kira Taylor, PhD, MS**

Doctoral Basic Science Graduate Student Award

1st Place: Aggie Williams

Mentor: **John Wise Sr., PhD**

Research Associate/Research Scientist Award

Winner: Haiyan Lu

Mentor: **John Wise Sr., PhD**

NCI Cancer Education Program Norbert J. Burzynski Award

Professional Student Category

3rd Place: Caitlin Cahill

Mentor: **John Wise Sr., PhD**

Undergraduate Student Category

2nd Place: Ayomikun Oyeleye

Mentor: **John Wise, Sr., PhD**

3rd Place: Bana Luulay

Mentor: **Banrida Wahlang, PhD**

Cancer Health Disparities Summer Bridge Program

1st Place: Sinopa Brewer

Mentor: **Daniel Conklin, PhD**

3rd Place: Caitlin Reynolds

Mentor: **Alexandra Nail, PhD & J. Christopher States, PhD**

Honorable Mention: Anna-Lee Harris

Mentor: **Rachel Neal, PhD**



CIEHS Research Voucher Presentations and P30 Environmental Health Sciences Pilot Project Research presentations



CIEHS Research Voucher Presentations and P30 Environmental Health Sciences Pilot Project Research presentations

Natasha DeJarnett, PhD, MPH, and Lauren Heberle, PhD, featured on Routine Checkup Radio Show

Dr. [Natasha DeJarnett](#), MOT RIG member, and Dr. [Lauren Heberle](#), CIEHS CEC Stakeholder Advisory Board member, were featured on Routine Checkup with [Hood Medicine Initiative](#). radio show to discuss Environmental Health Justice advocacy. Listen on Sirius XM [HERE](#). Hood Medicine Initiative's mission is to use science and tech to improve health outcomes for BIPOC communities.

Jamie Young, PhD, quoted in WFPL Article

Dr. Jamie Young was quoted in a WFPL article entitled "Toxic 'forever chemicals' polluted drinking water in this Ky. town. Residents say they didn't know." written by Ryan Van Velzer. Three years ago state officials found PFAS or "forever chemicals" polluting the drinking water in South Shore, KY. The city officials left South Shore residents in the dark about the contaminated water. Dr. Young explains how PFAS chemicals pose a risk to residents and they deserve to know, "Until we understand more and understand how to mediate this, give your customers the opportunity to make that decision for themselves." Read the full article on the WFPL website [HERE](#).

Awards Announcements and Reminders Continued

CIEHS Environmental Health Science Seminar

CIEHS welcomed external speaker Dr. Ana Navas-Acien for the September Environmental Health Science (EHS) seminar. If you were unable to attend this presentation entitled "Metallicomics: a powerful tool to advance medicine and public health" you can watch the full recording on the CIEHS YouTube channel [HERE](#). The upcoming CIEHS seminar features Dr. Gregory Barnes, Neuro RIG Leader, on October 6. Dr. Barnes' presentation is entitled "Impact of Metal Exposure and Cerebellar Neuroinflammation on Cognitive Circuits in Neurodevelopmental Disorders". View the full list of EHS seminars on the CIEHS website [HERE](#).

Center for Integrative Environmental Health Sciences,
Department of Pharmacology & Toxicology and
University of Louisville Superfund Research Center
Presented EHS Seminar with Special Guest

**Ana Navas-Acien,
MD, MPH, PhD**

Presentation Entitled:

*"Metallicomics: a powerful tool to
advance medicine and
public health"*



Dr. Ana Navas-Acien is a physician-epidemiologist with a specialty in Preventive Medicine and Public Health and a PhD in Epidemiology. Her research investigates the long-term health effects of environmental exposures (arsenic and other metals, tobacco smoke, e-cigarettes, air pollution), their interactions with genetic and epigenetic variants, and effective interventions for reducing involuntary exposures. She collaborates with major cohort studies such as the Strong Heart Study, a study of cardiovascular disease and its risk factors in American Indian communities, and the Multi-Ethnic Study of Atherosclerosis (MESA), a study of cardiovascular, metabolic and lung disease in urban settings across the US.

Occurred on
Thursday, September 1, 2022

UNIVERSITY OF
LOUISVILLE
CENTER FOR INTEGRATIVE
ENVIRONMENTAL HEALTH
SCIENCES



Dr. Ana Navas-Acien EHS flyer

Cynthia Corbitt, PhD, CHD Grant

Dr. Cynthia Corbitt, Neuro RIG member, and Dr. LaCreis Kidd received a grant from the KY Council on Postsecondary Education for the 2022 Cancer & Health Disparity Summer Bridge Program (CHD). Twelve rising freshmen from under-represented or low socio-economic backgrounds completed an eight-week mentored summer research program under the supervision of faculty engaged in environmental health, cancer, or health disparity basic, and population-based research at the University of Louisville. Some of the research topics included: the impact of cadmium on cell viability, colony formation, and DNA repair; effects of prenatal e-cigarette exposure on rodent offspring kidney weight; formaldehyde's effects on tracheal smooth muscle relaxation; lupus risk factors and treatments; impact of stress on infertility; childhood stress; knowledge of HIV treatment and transmission among African American Youth; and Covid-19 vaccine hesitancy in sexual/gender minorities. All of the students presented their research at UofL's Undergraduate Research Symposium on August 5, 2022. In addition, the students participated in professional development activities, cancer seminars, networking opportunities, and a study skills-building book club. The CHD summer bridge program adds to the pool of diverse students for future summer research programs for undergraduates, NIH diversity supplements, and ultimately professional school. This program was sponsored by a grant from the Kentucky Council on Postsecondary Education (PIs: Dr. LaCreis Kidd and Dr. Cynthia Corbitt). For more information contact: lacreis.kidd@louisville.edu or cynthia.corbitt@louisville.edu or visit the CHD YouTube channel [HERE](#).

Community Engagement Core Corner

As the summer months come to a close, the Community Engagement Core is excited to announce our new Community Resource Coordinator will arrive in October. We will be sure to properly introduce Mr. Caison Black in the next CIEHS newsletter. In the month of August, Dr. Huntington-Moskos took a trip out to Henderson, Kentucky to meet with Advanced Placement (AP) science teachers to discuss plans for working with the Henderson County High School Science Club on the issue of PFAS. We brainstormed projects and future meeting dates with students to build our partnership over the course of the school year. We are really excited to see what energy the students with bring to this important community issue. Not too long after this meeting, CIEHS investigator Dr. Jamie Young was part of a lecture to discuss PFAS contamination in the state of Kentucky, what community members can do, and how PFAS is present in communities across the United States. Dr. Young was part of the panel that also included Mr. Robert Bilott, the acclaimed PFAS advocate featured in the major motion picture *Dark Waters*. It was an exciting and inspiring event.

In addition to the collaborations in Henderson, Dr. Huntington-Moskos is also working to build connections with the Child Health and Climate Advocates group led by Drs. Julia Richards and Libby Mims. Dr. Huntington-Moskos is eager to share resources and support this group as they work to address the impacts of climate change on the health of young people in particular as well as their families.

We do have some partnerships brewing across the region and we will have more to share as the fall continues.

Notes from the Director:

September, 2022

The NIEHS continues to promote exposome research, an effort begun over a decade ago. In addition to the discussions at the Center Directors Meeting in July, the NIEHS held a series of virtual workshops titled "Accelerating Precision Environmental Health: Demonstrating the Value of the Exposome" over five weeks (July 22 – Aug 26). These workshops generated numerous discussions in small groups leading to several themes. These themes were then discussed in a 3-day virtual summit earlier this month aimed at operationalizing the exposome. A summary of the workshop discussions was distributed to CIEHS membership. Once a summary of the summit is available it also will be distributed. One thing that was brought to everyone's attention is that other NIH Institutes are issuing notices of funding opportunities involving exposome, e.g. NINDS. Members are encouraged to think how they might incorporate exposome into their research and take advantage of the current and upcoming opportunities. To this end, we emphasized exposome in the recent RFA for pilot project funding and will continue to do so with future RFAs.

Speaking of pilot awards, this latest round of awards will be funded by the C-RIF we received from the EVPRI. These funds are contingent upon the annual reports we receive from the membership. Please submit your report to Colleen if you have not done so already so that CIEHS will receive all that it is entitled to. This allocation does not affect the PI or department RIF allocations.

The UofL 'Give Some L' campaign will be launched soon. Once again CIEHS will ask for donations to the trainee travel fund. Donations will be matched by institutional funds allocated to CIEHS. Sarah Jump will provide information on how to donate. An easy way is payroll deduction. Several of us chose this method last year. If every member donated \$10/month CIEHS would provide 20 travel awards.

In other news, the annual UofL Research!Louisville event was held last week. Trainees in CIEHS member laboratories made a good showing winning several awards. Congratulations to the winners and their mentors.

The External Advisory Committee visit will be in December this year. The plan is for an in-person meeting, including a dinner at which members will have the opportunity to meet the Committee members. We solicited RSVPs earlier because we needed to make arrangements and commitments well in advance. Further information on the site visit will be distributed. We hope to see many of you showing your support by attending the presentations on December 13.

MEMBER GRANT AWARDS MAY, JUNE AND JULY 2022

Congratulations to the CIEHS members who had new grants, supplements and competitive renewals activated/awarded in the months of May, June and July 2022! Below is a list of the new awards. We are so proud of all the hard work of our CIEHS members. You truly are making UofL a nationally recognized premier metropolitan research University and promoting interdisciplinary collaborative research in our Center! You can also view these grants on the CIEHS website [HERE](#).

| PI Name | Other Investigator | Long Title | Sponsor | Amount |
|---|--|---|---------------------------------------|-----------|
| Bhatnagar, Aruni | Dejarnett, Natasha Krystal | Diversity Supplement to Urban Greenness and Cardiovascular Health | National Institutes of Health | \$151,287 |
| <p>This project is to determine how an increase in urban greenspaces affects cardiovascular disease risk, severity and mortality. To assess the impact of greenspaces, we will examine how an increase in neighborhood greenspaces affects the levels of air pollution and cardiovascular health in an urban community. The Diversity Supplement will allow Dr. Dejarnett to gain research experience investigating environmental health disparities as well as the potential temperature reducing benefits of increased tree canopy.</p> | | | | |
| Huntington-Moskos, Luz Guiomar | | Improving Asthma Self-Management using Report Back Strategies with Adolescents | Univ. of California-Davis | \$336,054 |
| <p>This study will provide empirical evidence about the impact of adolescent-led data collection coupled with personalized report back of asthma risk factors on asthma self-efficacy and asthma outcomes. The short-term impact will be adolescent skill building and improved asthma knowledge among participants. The intermediate impact will be a viable, ethical means to obtain objective data from adolescents and their home environment to improve asthma self-management among adolescents. In the long-term, this research will work to support improved asthma outcomes and lower total asthma-attributable costs.</p> | | | | |
| Kidd, LaCreis Renee | Alard, Pascale; Compton, Dwayne Monta; Corbitt, Cynthia; Neal, Rachel Elizabeth; Rai, Shesh Nath | FY2022 Cancer & Health Disparity Summer Bridge Program | KY Council on Postsecondary Education | \$200,000 |
| <p>Twelve college students from under-represented or low socio-economic backgrounds completed an eight-week mentored summer research program under the supervision of faculty engaged in environmental health, cancer, or health disparity basic, and population-based research at the University of Louisville. Please see page 3 for more information</p> | | | | |
| Sar, Bibhuti K. | Archuleta, Adrian J; Harris, Lesley Beth | Refugees Mental Health Needs Assessment Contract | Catholic Charities | \$67,000 |
| <p>The Kentucky statewide mental health needs assessment will gather information from key stakeholders engaged in services to refugees. The needs assessment will focus on identifying the eligible population, mental health literacy and mental health care needs, as well as what is needed to be successful in organizing wellness groups, equity and inclusion, and mental health screening.</p> | | | | |
| States, J. Christopher | | Diversity Supp: University of Louisville Center for Integrative Environmental Health Sciences | National Institutes of Health | \$172,083 |
| <p>This diversity supplement provides two years' support for Dr. Jamie L. Young in her new appointment as Assistant Professor of Pharmacology and Toxicology. Her research will focus on the role of chromium and PFAS exposure in liver disease etiology.</p> | | | | |
| Kirpich,Irina | McClain, Craig James | Role of Soluble Epoxide Hydrolase in Alcohol-Associated Liver Disease | National Institutes of Health | \$422,101 |

Alcohol-associated liver disease (ALD) is a spectrum of liver disorders ranging from hepatic steatosis to steatohepatitis with varying degrees of fibrosis and cirrhosis. ALD is a major cause of morbidity, mortality, and health care costs in the US and worldwide. However, there is no FDA-approved therapy for any stage of ALD. The overall goal of this project is to test the therapeutic efficacy of s-EH inhibition at different stages of ALD severity, and to provide a mechanistic foundation for using s-EH inhibition as a novel therapy for alcohol-induced liver pathology.

MEMBER GRANT AWARDS MAY, JUNE AND JULY 2022 CONTINUED

| PI Name | Other Investigator | Long Title | Sponsor | Amount |
|---|--|---|---|-----------|
| Corbitt, Cynthia | Kosiewicz, Michele Marie; Neal, Rachel Elizabeth | Prenatal Cigarette Smoke Exposure: Impact on Offspring Gut Bacterial Microbiome | National Institutes of Health | \$469,458 |
| <p>The studies proposed within this renewal application use a well-developed murine model of developmental exposure to tobacco smoke. We have shown effects of prenatal cigarette smoke exposure (CSE) on birth weight, catch-up growth, and gut bacterial microbiome in mouse dams and their offspring, as well as effects on offspring phenotype (preliminary data). We will measure the effect of cecal transfer of microbiomes post-weaning (Aim 1) or addition of dietary resistant starch (Aim 2) on those same measures in this model.</p> | | | | |
| Wahlang, Banrida | | Evaluating Mechanisms of Sex Differences in Environmentally-Induced Metabolic Diseases | National Institutes of Health | \$126,166 |
| <p>Mechanistic studies pertaining to sex-based differences in the metabolic syndrome are currently insufficient to explain and prevent the higher prevalence of certain metabolic conditions in women versus men and higher prevalence of other symptoms such as hyperlipidemia in men versus women. In addition, epidemiologic studies have reported that exposure to environmental chemicals such as persistent organic pollutants, including organochlorine pesticides, yield different health outcomes in men and women, and therefore, the current project aims to evaluate the underlying cellular mechanisms impacted by sexual dimorphism that potentially drive such differences. The concepts and information that will be gained from this grant will better address sex disparities in environmental health as well as provide health authorities with further knowledge to identify metabolic syndrome-related factors in susceptible populations and design sex-specific therapeutic strategies to better control future health care costs.</p> | | | | |
| Zhang, Huang-Ge | Merchant, Michael L; Park, Juw Won; Teng, Yun; Tyagi, Neetu | Mechanisms underlying edible exosome-like nanoparticles for prevention of brain inflammation | National Institutes of Health | \$665,624 |
| <p>Brain chronic inflammation is a hallmark of the aging process, and promotes the progression of many brain diseases, and there is currently no approved therapy for preventing brain chronic inflammation. The focus of this application is to determine the molecular mechanism through which tiny nanoparticles derived from diet can interact with brain macrophages to inhibit brain inflammation. Defining these underlying mechanisms will provide a strategy for prevention/treatment of brain aging, and thus improve the health status.</p> | | | | |
| El-Baz, Ayman Sabry | Barnes, Gregory Neal; Giridharan, Guruprasad Anapathur | PFI-TT: Novel Artificial Intelligence Approach for Automatic Identification of Genetic and Neuroimaging Markers of Autism Spectrum Disorder | National Science Foundation | \$249,995 |
| <p>Pediatric autism diagnosis currently relies on subjective evaluations of child behavior. The proposed project aims to produce a computer-assisted diagnostic (CAD) system for autism diagnosis based on objective metrics derived from multimodal brain imaging and genomic risk factors.</p> | | | | |
| Bhatnagar, Aruni | Smith, Theodore Russell | DOC COVID-19 Wastewater Program - Analysis | Commonwealth of Kentucky | \$209,176 |
| <p>Sewer Monitoring uses wastewater-based epidemiology to monitor the presence of SARS-CoV-2 in Louisville's sewer system. This grant, sponsored by the Commonwealth of Kentucky, will help facilitate analyzing the COVID-19 wastewater research data.</p> | | | | |
| Barbee-Cunningham, Anita | Antle, Becky F | SFY 23 Differential Response Implementation and Evaluation (C4107) | KY Cabinet for Health & Family Services | \$609,180 |

Total New Awards May, June and July 2022: \$3,678,124

JULY PUBLICATIONS HIGHLIGHTS

Congratulations to the CIEHS members with articles published in the month of July! Member names will be bolded and impact statements for the publications are italicized. You may also read the publication by clicking on the PMID underlined.

1. Boakye E, Osuji N, Erhabor J, Obisesan O, Osei AD, Mirbolouk M, Stokes AC, Dzaye O, El Shahawy O, Hirsch GA, Benjamin EJ, DeFilippis AP, Robertson RM, **Bhatnagar A**, Blaha MJ. Assessment of Patterns in e-Cigarette Use Among Adults in the US, 2017-2020. JAMA Netw Open. 2022 Jul 1;5(7):e2223266. doi: 10.1001/jamanetworkopen.2022.23266. PMID: [35867060](#).
***Impact Statement:** In this study, a slight decrease in the prevalence of current e-cigarette use was found between 2018 and 2020; this decrease was mainly observed among young adults aged 18 to 20 years. In contrast, daily e-cigarette use consistently increased, particularly among young adults aged 21 to 24 years. This increase in daily use suggests greater nicotine dependence among those who use e-cigarettes, warranting continued surveillance.*
2. Mirbolouk M, Boakye E, Obisesan O, Osei AD, Dzaye O, Osuji N, Erhabor J, Stokes AC, El-Shahawy O, Rodriguez CJ, Hirsch GA, Benjamin EJ, DeFilippis AP, Marie Robertson R, **Bhatnagar A**, Blaha MJ. E-cigarette use among high school students in the United States prior to the COVID-19 pandemic: Trends, correlates, and sources of acquisition. Prev Med Rep. 2022 Jul 22;29:101925. doi: 10.1016/j.pmedr.2022.101925. PMID: 35911577; PMCID: [PMC9326337](#).
***Impact Statement:** Youth e-cigarette use remains a significant public health problem with a concerning emerging pattern of more frequent use. Also, with the increasing proportion of youth tobacco users making quit attempts, age-appropriate cessation programs need to be assessed and made available to aid cessation efforts. Finally, the sources of e-cigarettes among youth are changing; continued surveillance is therefore required to inform effective and timely policies.*
3. Poudel R, Daniels LB, DeFilippis AP, Hamburg NM, Khan Y, Keith RJ, Kumar RS, Strokes AC, Robertson RM, **Bhatnagar A**. Smoking is associated with increased risk of cardiovascular events, disease severity, and mortality among patients hospitalized for SARS-CoV-2 infections. PLoS One. 2022 Jul 15;17(7):e0270763. doi: 10.1371/journal.pone.0270763. PMID: 35839264; PMCID: [PMC9286231](#).
***Impact Statement:** Among a large population of patients admitted for COVID-19, smoking was associated with a higher risk of severe COVID-19, including death or mechanical ventilation, independent of sociodemographic characteristics and medical history.*
4. Kuehl PJ, McDonald JD, Weber DT, Khlystov A, Nystoriak MA, **Conklin DJ**. Composition of aerosols from thermal degradation of flavors used in ENDS and tobacco products. Inhal Toxicol. 2022 Aug 1:1-10. doi: 10.1080/08958378.2022.2103602. Epub ahead of print. PMID: [35913821](#).
***Impact Statement:** Because flavors are important components of electronic cigarettes that enhance the appeal of electronic cigarettes to youth, we investigated the effects of thermal degradation on common flavors used in electronic cigarettes. Unsurprisingly, thermal degradation at low and high temperatures led to a variety of degradation products that included harmful and potentially harmful constituents (HPHCs). The toxicity of inhaled flavor-derived degradation products needs greater study to protect public health.*
5. Liu W, Luo T, Wang F, Zhang D, Liu T, **Huang J**, Xu S. Effect of Preoperative Thoracic Paravertebral Blocks on Emergence Agitation During Tracheal Extubation: A Randomized Controlled Trial. Front Med (Lausanne). 2022 Jun 22;9:902908. doi: 10.3389/fmed.2022.902908. PMID: 35814746; PMCID: [PMC9257130](#).
***Impact Statement:** Preoperative thoracic paravertebral block was associated with less Emergence Agitation during tracheal extubation when compared with ICNB in patients undergoing thoracoscopic lobectomy.*
6. Sangroula D, Maggard B, Abdelhaleem A, Furmanek S, Clemons V, Marsili B, Stikes R, Hill M, Sigdel A, Clifford SP, **Huang J**, Akca O, Logsdon MC. Hemodynamic changes associated with neuraxial anesthesia in pregnant women with covid 19 disease: a retrospective case-control study. BMC Anesthesiol. 2022 Jun 9;22(1):179. doi: 10.1186/s12871-022-01719-0. PMID: 35681119; PMCID: [PMC9178224](#).
***Impact Statement:** Incidence and severity of hypotension after neuraxial blocks were similar between COVID-19 positive and COVID-19 negative parturients.*
7. Nyenhuis S, Cramer E, Grande M, **Huntington-Moskos L**, Krueger K, Bimbi O, Polivka B, Eldeirawi K. Utilizing Real-time Technology to Assess the Impact of Home Environmental Exposures on Asthma Symptoms: Protocol for an Observational Pilot Study. JMIR Res Protoc. 2022 Aug 2;11(8):e39887. doi: 10.2196/39887. PMID: [35916686](#).
***Impact Statement:** It is estimated that over 60% of adults with asthma have uncontrolled symptoms, representing a substantial health and economic impact. Findings from this feasibility study will support a powered study to address the impact of home environmental exposures on asthma symptoms and develop tailored, home-based asthma interventions that are responsive to the changing home environment and home routines.*

JULY PUBLICATIONS HIGHLIGHTS CONTINUED

8. Ghosh S, Singh R, Vanwinkle ZM, Guo H, Vemula PK, Goel A, Haribabu B, **Jala VR**. Microbial metabolite restricts 5-fluorouracil-resistant colonic tumor progression by sensitizing drug transporters via regulation of FOXO3-FOXM1 axis. *Theranostics*. 2022 Jul 18;12(12):5574-5595. doi: 10.7150/thno.70754. PMID: 35910798; PMCID: [PMC9330515](#).
Impact Statement: *This research has shown that a metabolite produced by gut microbes from a component found in pomegranates and berries can help improve the effectiveness of chemotherapy used to treat colorectal cancer.*
9. Tracy EP, Rowe G, **LeBlanc AJ**. Cell therapy-induced recovery of dysfunctional microvasculature. *Aging (Albany NY)*. 2022 Jul 13;14(13):5296-5298. doi: 10.18632/aging.204183. Epub 2022 Jul 13. PMID: 35832022; PMCID: [PMC9320541](#).
Impact Statement: *The objective of this editorial was to address additional points of consideration in understanding the intricate mechanistic underpinnings surrounding the use of cell therapy in treating microvascular dysfunction. Additionally, the authors provide a summary graphic of these potential contributing mechanisms and also suggest new avenues worth investigating.*
10. El-Kersh K, Danielle Hopkins C, Wu X, **Rai SN, Cai L, Huang J**. Plasma level of antimony correlates with pulmonary arterial hypertension severity. *Curr Res Toxicol*. 2022 Jun 27;3:100080. doi: 10.1016/j.crtox.2022.100080. PMID: 35800661; PMCID: [PMC9254336](#).
Impact Statement: *In our pilot study, significantly higher antimony levels in blood and plasma of pulmonary hypertension patients when compared to controls. We also found a significant correlation between plasma antimony level and all the prognostic hemodynamic parameters of PAH.*
11. Jagadapillai R, Qiu X, Ojha K, Li Z, El-Baz A, Zou S, Gozal E, **Barnes GN**. Potential Cross Talk between Autism Risk Genes and Neurovascular Molecules: A Pilot Study on Impact of Blood Brain Barrier Integrity. *Cells*. 2022 Jul 15;11(14):2211. doi: 10.3390/cells11142211. PMID: 35883654; PMCID: [PMC9315816](#).
Impact Statement: *Autism Spectrum Disorder (ASD) is a common pediatric neurobiological disorder with up to 80% of genetic etiologies. Systems biology approaches may make it possible to test novel therapeutic strategies targeting molecular pathways to alleviate ASD symptoms. Although our research is preliminary, our data demonstrate the potential for developing novel therapeutic strategies based on clinically derived data, genomics, cognitive neuroscience, and basic neuroscience methods.*
12. Nilima N, Mani K, Kaushik S, **Rai SN**. Cervical Cancer Screening and Associated Barriers among Women in India: A Generalized Structural Equation Modeling Approach. *Cancers (Basel)*. 2022 Jun 23;14(13):3076. doi: 10.3390/cancers14133076. PMID: 35804848; PMCID: [PMC9264854](#).
Impact Statement: *Exploring the barriers and facilitators of cervical cancer screening is essential to reduce the incidence and mortality, particularly in India. There is a paucity of studies presenting the mediation effects of known barriers and facilitators. The study investigates individual-level social barriers, facilitators, and the factors that mediate the relationships between suspected factors and cervical cancer screening. Understanding the mediation analysis and the effect of mediators will help us acquire a profound understanding of the mechanism of action, which will facilitate in devising strategies keeping the most important factor and their mediators in mind.*
13. Das S, Rai A, **Rai SN**. Differential Expression Analysis of Single-Cell RNA-Seq Data: Current Statistical Approaches and Outstanding Challenges. *Entropy (Basel)*. 2022 Jul 18;24(7):995. doi: 10.3390/e24070995. PMID: 35885218; PMCID: [PMC9315519](#).
Impact Statement: *With the advent of single-cell RNA-sequencing (scRNA-seq), it is possible to measure the expression dynamics of genes at the single-cell level. We critically discuss the underlying statistical principles of the approaches and distinctly divide them into six major classes, i.e., generalized linear, generalized additive, Hurdle, mixture models, two-class parametric, and non-parametric approaches. This study will serve as a guide to genome researchers and experimental biologists to objectively select options for their analysis.*
14. Petri BJ, Piell KM, **Wahlang B**, Head KZ, Andreeva K, Rouchka EC, Pan J, **Rai SN, Cave MC, Klinge CM**. Multiomics analysis of the impact of polychlorinated biphenyls on environmental liver disease in a mouse model. *Environ Toxicol Pharmacol*. 2022 Jul 6;94:103928. doi: 10.1016/j.etap.2022.103928. Epub ahead of print. PMID: [35803474](#).
Impact Statement: *Exposure to polychlorinated biphenyls (PCBs) has been implicated in a variety of metabolic diseases, including non-alcoholic fatty liver disease (NAFLD). The combined insult of this toxicant exposure and a high-fat, western diet causes an accumulation of lipids in the liver than can progress to fibrosis and cirrhosis. This study employed a multi-omics approach to address the miRNA-mRNA-protein network dysregulated in NAFLD. Results show that exposure of mice to PCBs and high fat diet drastically altered the mRNA and miRNA transcriptomes in liver and identified unique inverse relationships between altered miRNA and selected mRNA targets that may play a role in reprogramming the liver during NAFLD progression.*
15. Yuan J, Mo L, Mo Y, Zhang Y, Zhang Y, **Zhang Q**. A protective role of autophagy in fine airborne particulate matter-induced apoptosis in LN-229 cells. *Toxicology*. 2022 Jul 22;477:153271. doi: 10.1016/j.tox.2022.153271. Epub ahead of print. PMID: [35872226](#).
Impact Statement: *This study demonstrated that exposure of LN-229 cells to PM2.5 caused autophagy and apoptosis through PM2.5-induced ROS generation, mainly by mitochondria, and JNK activation. Autophagy may have a transient protective role in PM2.5-induced apoptosis. Our findings have important implications for understanding the potential neurotoxicity of PM2.5.*

AUGUST PUBLICATIONS HIGHLIGHTS

Congratulations to the CIEHS members with articles published in the month of August! Member names will be bolded and impact statements for the publications are italicized. You may also read the publication by clicking on the PMID underlined.

1. Feehan J, Hariharan R, Buckenham T, Handley C, **Bhatnagar A**, Baba SP, de Courten B. Carnosine as a potential therapeutic for the management of peripheral vascular disease. *Nutr Metab Cardiovasc Dis*. 2022 Jul 16;S0939-4753(22)00295-2. doi: 10.1016/j.numecd.2022.07.006. Epub ahead of print. PMID: [35973888](#).

Impact Statement: *The aim of this research is to evaluate the potential role of carnosine in the management of peripheral vascular disease. We found that carnosine may have a role as an adjunct treatment for peripheral vascular disease alongside typical exercise and surgical interventions, and may be used in high risk individuals to aid in the prevention of atherogenesis.*

2. Benowitz NL, Goniewicz ML, Halpern-Felsher B, Krishnan-Sarin S, Ling PM, O'Connor RJ, Pentz MA, Robertson RM, **Bhatnagar A**. Tobacco product use and the risks of SARS-CoV-2 infection and COVID-19: current understanding and recommendations for future research. *Lancet Respir Med*. 2022 Sep;10(9):900-915. doi: 10.1016/S2213-2600(22)00182-5. Epub 2022 Aug 16. PMID: 35985357; PMCID: [PMC9381032](#).

Impact Statement: *Results from epidemiological studies of the effects of cigarette smoking on SARS-CoV-2 infection are conflicting, and further research is needed to establish whether or not smoking affects susceptibility to SARS-CoV-2 infection.*

3. Ye F, Sun C, Xie Y, Wang B, **Cai L**. Editorial: Medical Application and Radiobiology Research of Particle Radiation. *Front Public Health*. 2022 Jul 22;10:955116. doi: 10.3389/fpubh.2022.955116. PMID: 35942260; PMCID: [PMC9356341](#).

Impact Statement: *The paper provides a comprehensive review of saturated and unsaturated aldehydes in exhaled breath and their sources from lipid peroxidation. Some of these aldehydes in exhaled breath have been reported as biomarkers of lung cancer.*

4. Dai X, Wang K, Fan J, Liu H, Fan X, Lin Q, Chen Y, Chen H, Li Y, Liu H, Chen O, Chen J, Li X, Ren D, Li J, **Conklin DJ**, **Wintergerst KA**, Li Y, **Cai L**, Deng Z, Yan X, Tan Y. Nrf2 transcriptional upregulation of IDH2 to tune mitochondrial dynamics and rescue angiogenic function of diabetic EPCs. *Redox Biol*. 2022 Aug 28;56:102449. doi: 10.1016/j.redox.2022.102449. Epub ahead of print. PMID: [36063728](#).

Impact Statement: *This study reveals novel actions of the transcription factor Nrf2 in protecting proangiogenic endothelial progenitor cell (EPC) functions by regulating mitochondrial dynamics via upregulating IDH2 expression in both human diabetics and murine model of diabetes. This study fills the gaps in knowledge about why and how EPC dysfunction occurs in diabetes, and it provides the scientific groundwork for developing new therapies for diabetic patients with ischemic vascular diseases.*

5. Blair LK, Warner ET, James P, Hart JE, VoPham T, Barnard ME, Newton JD, Murthy DJ, Laden F, Tamimi RM, **DuPre NC**. Exposure to natural vegetation in relation to mammographic density in a Massachusetts-based clinical cohort. *Environ Epidemiol*. 2022 Jul 19;6(4):e216. doi: 10.1097/EE9.0000000000000216. PMID: 35975164; PMCID: [PMC9374192](#).

Impact Statement: *We examined the association between greenness and mammographic density—a strong breast cancer risk factor—to determine whether greenness influences breast tissue composition independent of lifestyle factors. We found greenness exposures were not associated with mammographic density. Prior observations of a protective association between greenness and breast cancer may not be driven by differences in breast tissue composition, as measured by mammographic density, but rather other mechanisms.*

6. Habil MR, Salazar-González RA, Doll MA, **Hein DW**. Differences in β -naphthylamine metabolism and toxicity in Chinese hamster ovary cell lines transfected with human CYP1A2 and NAT2*4, NAT2*5B or NAT2*7B N-acetyltransferase 2 haplotypes. *Arch Toxicol*. 2022 Aug 30. doi: 10.1007/s00204-022-03367-2. Epub ahead of print. PMID: [36040704](#).

Impact Statement: *β -naphthylamine (BNA) is an important arylamine carcinogen that is classified as a Group 1 human urinary bladder carcinogen by the International Agency for Research on Cancer. The purpose of this study was to investigate BNA metabolism and toxicity in Chinese hamster ovary cells transfected with human CYP1A2 and either human N-acetyltransferase 2 alleles NAT2*4 (rapid acetylator allele), NAT2*5B (common slow acetylator allele in Europe), or NAT2*7B (common slow acetylator allele in Asia). The study showed that NAT2 genetic polymorphisms modulate BNA N-acetylation and its associated mutagenicity and DNA damage and further suggests that heterogeneity within the "slow" NAT2 acetylator phenotype should be incorporated into cancer risk studies among the individuals exposed to BNA.*

7. Cheryl L. Woods-Giscombe, Edilma L. Yearwood, Dave Ngugi, Lilian Bravo, Patty R. Wilson, Pamela Minarik, Jada Brooks, Tamar Rodney, Shaquita Starks, Mia Pasini, Mary Louise Tatum, **Vicki Hines Martin**. Honoring the past and charting the future: The International Society of Psychiatric Mental Health Nurses' commitment to advance diversity and equity in mental health care, *Archives of Psychiatric Nursing*, 2022, ISSN 0883-9417, <https://doi.org/10.1016/j.apnu.2022.08.006>.

Impact Statement: *The International Society of Psychiatric-Mental Health Nurses is committed as an organization and as members to continue addressing health disparities for improvement of mental health outcomes in underserved communities. As a committee, we recognize significant mental health disparities exist within populations, such as racially and ethnically diverse and LGBTQ+ communities. We will continue addressing health disparities in our research and initiatives and work collaboratively to push the profession forward by introducing innovative strategies for promoting mental health workforce diversity.*

AUGUST PUBLICATIONS HIGHLIGHTS CONTINUED

8. Tracy EP, Nair R, Rowe G, Beare JE, Beyer A, **LeBlanc AJ**. Adipose Stromal Vascular Fraction Reverses Mitochondrial Dysfunction and Hyperfission in Aging-Induced Coronary Microvascular Disease. *Am J Physiol Heart Circ Physiol*. 2022 Aug 26. doi: 10.1152/ajpheart.00311.2022. Epub ahead of print. PMID: [36018760](#).
Impact Statement: *This study details how the mitochondria in small vessels from the heart become dysfunctional as a result of aging alone, and that this dysfunction can lead to mismanaged blood flow. When old rats were treated with an infusion of regenerative cells from adipose tissue, or fat, the mitochondria exhibit positive effects, similar to the youth phenotype, and this results in improved vascular function.*
9. Tracy EP, Dukes M, Beare J, Rowe G, Nair R, **LeBlanc AJ**. Stromal Vascular Fraction Restores Vasodilatory Function by Reducing Oxidative Stress in Aging-Induced Coronary Microvascular Disease. *Antioxid Redox Signal*. 2022 Aug 11. doi: 10.1089/ars.2021.0249. Epub ahead of print. PMID: [35950616](#).
Impact Statement: *In advancing age, even without comorbidities, there is a shift in reactive oxygen species balance in the circulation and that leads the body more susceptible to the onset of cardiovascular disease. This study demonstrates that a cell therapy derived from adipose tissue can tip the balance back to a more youthful phenotype and also elicit improved vascular reactivity to circulating catecholamines. This renders the aging heart more resistant and impervious to heart disease.*
10. Amraotkar AR, Bushau-Sprinkle AM, Keith RJ, Hamorsky KT, Palmer KE, Gao H, **Rai SN, Bhatnagar A**. Pre-Existing Comorbidities Diminish the Likelihood of Seropositivity after SARS-CoV-2 Vaccination. *Vaccines (Basel)*. 2022 Aug 20;10(8):1363. doi: 10.3390/vaccines10081363. PMID: [36016250](#); PMCID: [PMC9416221](#).
Impact statement: *Liver disease associated with long-term heavy drinking of alcoholic beverages is a major health problem with no FDA-approved therapies. In this paper, we describe a previously unknown mediator of alcohol's adverse effects on the liver: the alpha4 subunit of nicotinic acetylcholine receptors. These neurotransmitter receptors are known to be important in the brain, where they are involved in the reward pathways activated by both nicotine and alcohol. The discovery that they are also expressed in the liver and contribute to some of the earliest manifestations of alcohol-associated liver disease points to a new target for potential therapeutic interventions.*
11. Lee S, Zhang Y, Newhams M, Novak T, Thomas PG, Mourani PM, Hall MW, Loftis LL, Cvijanovich NZ, Tarquinio KM, Schwarz AJ, Weiss SL, Thomas NJ, Markovitz B, Cullimore ML, Sanders RC, Zinter MS, **Sullivan JE**, Halasa NB, Bembea MM, Giuliano JS, Typpo KV, Nofziger RA, Shein SL, Kong M, Coates BM, Weiss ST, Lange C, Su HC, Randolph AG; PALISI Pediatric Intensive Care Influenza (PICFlu) Investigators and the TOPMed Investigators. DDX58 is Associated with Susceptibility to Severe Influenza Virus Infection in Children and Adolescents. *J Infect Dis*. 2022 Aug 20;jiac350. doi: 10.1093/infdis/jiac350. Epub ahead of print. PMID: [35986912](#).
Impact Statement: *Worldwide, the prevalence of obesity continues rising unabated due to the rapid urbanization in the developed and developing countries and poor lifestyle habits. Obesity is also attributed to the development of major cardiovascular diseases (CVD), diabetes, arthritis, behavioral changes, depression, cancers, and hepatic diseases. Therefore, a special issue focus on the CVDs related to diabetes and obesity has been released, for which this editorial was and also briefly introduced the contents of the twelve publications, with a hope to set the stage for delving further in deciphering the crucial link between obesity and diabetes.*
12. Lin Q, Chen O, **Wise JP Jr**, Shi H, **Wintergerst KA**, Cai L, Tan Y. FGF1ΔHBS delays the progression of diabetic nephropathy in late-stage type 2 diabetes mouse model by alleviating renal inflammation, fibrosis, and apoptosis. *Biochim Biophys Acta Mol Basis Dis*. 2022 Aug 1;1868(8):166414. doi: 10.1016/j.bbadis.2022.166414. Epub 2022 Apr 18. PMID: [35447340](#).
Impact Statement: *Elderly adults are at higher risk for developing diabetic complications including diabetic nephropathy (DN), contributing to excess morbidity and mortality in elderly individuals. This study demonstrated that FGF1ΔHBS delays the progression of renal dysfunction likely through activating PPARα to prevent renal tubule cell death in late-stage T2D, exhibiting a promising translational potential in treating DN in elderly T2D individuals by ameliorating renal inflammation, fibrosis and apoptosis.*
13. Smith T, Holm RH, **Yeager R**, Moore JB 4th, Rouchka EC, Sokoloski KJ, Elliott EM, Talley D, Arora V, Moyer S, **Bhatnagar A**. Combining Community Wastewater Genomic Surveillance with State Clinical Surveillance: A Framework for SARS-CoV-2 Public Health Practice. *Food Environ Virol*. 2022 Aug 18:1–7. doi: 10.1007/s12560-022-09531-2. Epub ahead of print. PMID: [35982363](#); PMCID: [PMC9387882](#).
Impact Statement: *This study aimed to develop a framework for combining community wastewater surveillance with state clinical surveillance for the confirmation of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) variants within the community and to provide recommendations on how to expand on such research and apply the findings in public health responses. This paper presents evidence that complementary wastewater and clinical testing are cost-effectively enhanced when used in combination, as they provide a strong tool for a joint public health framework.*
14. Zierold KM, Sears CG, Myers JV, Brock GN, **Zhang CH, Sears L**. Exposure to coal ash and depression in children aged 6-14 years old. *Environ Res*. 2022 Aug 6;214(Pt 3):114005. doi: 10.1016/j.envres.2022.114005. Epub ahead of print. PMID: [35944620](#).
Impact Statement: *Children living near coal power plants and coal ash storage sites may be at increased risk for neurobehavioral problems due to known neurotoxic metals contained in coal ash. Indoor air was sampled in 280 homes of children living within 10 miles of a coal burning power plant and results indicated that 43% of children had coal ash in the home. These children were at increased risk of a depressive disorder compared to children without coal ash in the home. Results indicate an increased risk for depression in children exposed to coal ash in the home.*