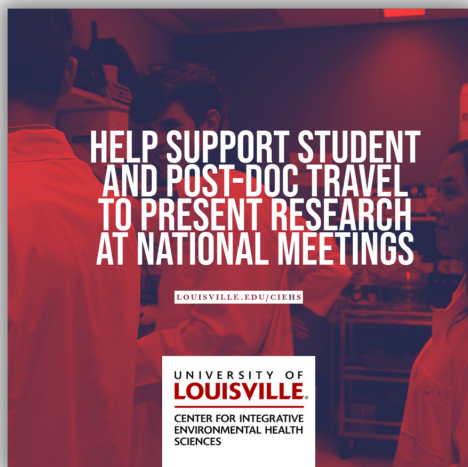


MONTHLY NEWSLETTER

CIEHS Up to Date News and Accomplishments

Awards Announcements and Reminders



Trainee Travel Fund

CIEHS has initiated a fund to support student and Post-Doc travel to present their research at national meetings. We will be issuing an RFA for student/post-doc travel awards (up to \$500 each) once we have enough funds in the donation account. Click [HERE](#) to contribute now.

CIEHS Reception

Thank you to everyone who attended the CIEHS reception on June 30th to celebrate a successful first year and to thank Dr. Gary Hoyle for his service to CIEHS upon his retirement. Dean Toni M. Ganzel, MD, MBA, made a guest appearance to congratulate CIEHS on all of our accomplishments and to wish CIEHS the best of luck for years to come.



Christopher States, Ph.D. (right) presenting Gary Hoyle, Ph.D. (left) with a Louisville Slugger Bat in appreciation of his service

WELCOME OUR NEW MEMBERS:

MOT RIG:

Amanda Jo LeBlanc, Ph.D.
Banrida Wahlang, Ph.D.
Xiao-An Fu, Ph.D.

Neuro RIG:

Jun Cai, M.D., Ph.D.

CEC Core:

Josie Willis, MSW

CONNECT WITH US ON SOCIAL MEDIA:



Awards Announcements and Reminders Continued

CIEHS Environmental Health Series Seminar with Special Guest Dr. Deborah Cory-Slechta

In case you missed Dr. Deborah Cory-Slechta's seminar entitled "Ambient Ultrafine Particle Air Pollution and Neurodevelopmental Disorders" you can view the presentation [HERE](#). This EHS series seminar occurred on Thursday, June 3rd at 11 AM EDT.



Deborah A. Slechta, Ph.D.
Series Seminar Poster



Deborah A. Slechta, Ph.D.
Seeing the sights of Louisville with Christopher States, Ph.D.

CIEHS Environmental Health Series Seminar with Dr. Matthew Cave

CIEHS welcomes IHSFC Core Director, Dr. Matthew Cave, as the next EHS seminar speaker on Thursday, August 5th at 11 AM. Dr. Cave's presentation is entitled "Environmental Liver Disease Update". This will be a hybrid event, click [HERE](#) to access the MS Teams link or attend in person at Clinical and Translational Research Building (CTR) room 124.

CIEHS Environmental Health Series Seminar with Special Guest Dr. Miroslav (Mirek) Styblo

CIEHS welcomes Dr. Mirek Styblo as a guest speaker on Thursday, September 2nd at 11 AM EDT. Dr. Styblo's presentation is entitled "Humanized mouse models for arsenic toxicology". Dr. Styblo is a Professor of Nutrition and Director of the BSPH-MS Program in Nutrition at Gillings School of Global Public Health, University of North Carolina at Chapel Hill.



Mirek Styblo, Ph.D.
Series Seminar Poster

IHSFC Research Voucher Awards Cycle 2

Congratulations to CIEHS members who received a Cycle 2 IHSFC Research Voucher Award!

Principal Investigator: Timothy O'Toole Ph.D.

Collaborator: NA

Title: The Nucleophilic Defense Against PM Toxicity (NEAT) Trial
Description: Carnosine is a naturally-occurring protein and over-the-counter dietary supplement that has anti-oxidant properties and has found widespread use amongst performance athletes. In this clinical study, we will test its efficacy in limiting the adverse effects of air pollution exposure on cardiovascular function, physical function, and cognition.

Principal Investigator: Jiapeng Huang, M.D., Ph.D.

Collaborator: Lu Cai, M.D., Ph.D.

Title: The Impact of Cadmium on Pulmonary Arterial Hypertension in a Mouse Model

Description: This project will explore whether exposure to cadmium may worsen pulmonary hypertension and right ventricular dysfunction in a mouse model. The results will shed lights on environmental effects in the etiology and progression of pulmonary hypertension and right ventricular dysfunction

Awards Announcements and Reminders Continued



Amanda Jo LeBlanc, Ph.D.

Amanda Jo LeBlanc, Ph.D. Pilot Project Program Core Leader

Congratulations to Dr. Amanda Jo LeBlanc, the new CIEHS Pilot Project Program Leader, for taking the place of Dr. Gary Hoyle who retired from UofL in July 2021. Dr. LeBlanc is an Associate Professor in the Department of Physiology and her laboratory is located in UofL's Cardiovascular Innovation Institute. Dr. LeBlanc's research focus is primarily on myocardial and microvascular regenerative medicine in a model of advanced age. Specific topics of current projects and interests include sex-specific coronary physiology, adipose-derived cell-based therapeutics, and cardiovascular toxicology related to nanoparticle inhalation. CIEHS wants to thank Dr. Hoyle for his commitment to the Pilot Project Program and welcome Dr. LeBlanc as the new program leader.



Carolyn M. Klinge, Ph.D.

Carolyn M. Klinge, Ph.D. Cancer RIG Leader

Congratulations to Dr. Carolyn M. Klinge who is the new CIEHS Cancer Research Interest Group Leader. Dr. Klinge is a Professor in the Department of Biochemistry & Molecular Genetics. Dr. Klinge's research interests include mechanisms of resistance to endocrine therapies targeting estrogen receptor in breast cancer and the impact of environmental contaminants on the epitranscriptome and how these changes relate to NAFLD. CIEHS welcomes Dr. Klinge as the new Cancer RIG leader and gives thanks to Dr. John P. Wise for his service as the previous Cancer RIG leader.



Sarah Jump celebrating defense in the CIEHS office

Sarah Jump Thesis Defense

Congratulations to Sarah Jump, CIEHS Program Coordinator, for successfully defending her Master's Thesis entitled "Approaching Trans Debates as Fascistic Sites of Engagement" on July 21st. Sarah will graduate with a Master's of Communication at the end of the Summer 21' semester.

Notes from the Director:

July, 2021

The CIEHS continues to grow and mature. We welcome two new people to the leadership team. Dr. Amanda LeBlanc now leads the Pilot Project Program, and Dr. Carolyn Klinge now leads the Cancer Research Interest Group. Dr. LeBlanc also will serve on the Executive Committee and both Drs. LeBlanc and Klinge will serve on the Internal Advisory Committee. The membership also has grown as noted in this newsletter. We look forward to everyone's contributions to the Center research programs.

The situation with COVID appears to be backsliding. The delta variant is highly contagious and infected individuals shed approximately 1,000 times more virus. The impacts of this characteristic are that disease progresses more rapidly, and even vaccinated people can transmit the virus if they are infected. We are seeing a rise in 'breakthrough' infections in vaccinated people. Note that this does not mean that the vaccines are ineffective. Effectiveness is judged by the reduction in disease, especially severe disease. Thus far, the vaccines are effective at preventing severe disease. As of the time of this writing, UofL has not yet changed its official COVID policy. However, the new CDC guidelines recommend that even vaccinated people should wear masks indoors in regions with high transmission. Jefferson county has a transmission rate that makes it a region of high transmission, it is likely we will see a return to wearing masks. Those who are not already vaccinated are strongly encouraged to get vaccinated. Those who are vaccinated are advised to exercise caution, especially if they or those who live with them are at high risk due to age or medical condition.

The Pilot Project Program continues with 5 new awards this year. You can see the descriptions of these projects on the CIEHS website (<https://louisville.edu/ciehs/cores/pilot/pilot-project-awards-2021>). Both the IHSFC and ITEMFC make awards for research vouchers. The IHSFC made two awards thus far this year (<https://louisville.edu/ciehs/cores/ihsfc/cycle-2-may-2021-ihsfc-research-voucher-awards>). The next competition for IHSFC and ITEMFC research vouchers will accept applications in September.

Our next external speaker, Dr. Miroslav Styblo, will visit UofL to present a seminar on September 2 as the guest of the Multi-Organ Toxicology Research Group. Dr. Styblo is a long established investigator in arsenic toxicology. He will present on the new mouse model humanized for AS3MT developed by his group at University of North Carolina - Chapel Hill. The MOTRIG members will meet with Dr. Styblo over lunch after the seminar. There are a few time slots for small group meetings in the morning before the seminar.

The CIEHS reception last month was well attended. It was great to see everyone in person! We are having a Center-wide meeting August 12 to discuss anti-racism efforts that CIEHS can initiate as part of NIH-wide initiative. We hope you will be able to participate. The meeting will be at 2:00pm in CTRB124. It will be hybrid, but we hope most will be present in person for better discussion.

Summer is passing quickly and the students will be back full time very soon. We hope your summer has been pleasant and that you can get some time for a break before the fall semester gets into full gear. Lastly, please remember to cite the P30 grant in your publications and presentations. Thank you.

MEMBER GRANT AWARDS FOR APRIL/MAY

Congratulations to CIEHS members who received new grants in the month of April and May 2021! 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 by following this [LINK](#).

PI Name	Other Investigator	Long Title	Sponsor	Amount
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**Jophlin,
Loretta
Lynn**

Interaction of the Microtubule Cytoskeleton and Perilipin-2 Regulates Hepatic Lipid Droplets - a Potential Therapeutic Target for Fatty Liver Disease

National Institutes of Health

\$165,780.00

Non-alcoholic fatty liver disease (NAFLD) affects millions of Americans and can lead to cirrhosis, liver cancer, need for liver transplantation and death. Excess fat stored within lipid droplets (LDs) of liver cells is responsible for this disease, and this project aims to better understand LDs as a potential therapeutic target for NAFLD.

**Sullivan,
Janice**

Pediatric Trial Network eSource Study Selection

Duke University

\$2,500.00

The purpose of this award was to investigate our interest and the potential feasibility of using software that automatically transfers data from electronic medical records at our site to a study sponsor's electronic data capture system.

**Huntington-
Moskos, Luz
Guiomar**

The Changing COVID-19 Landscape: A Feasibility Study to Capture Momentary Residential Environmental Exposures and Asthma Symptoms in Adults

University of Kansas Medical Center

\$19,308.00

The long term goal of this study is to characterize the impact of COVID-19 on existing asthma risk factors so as to develop tailored, home-based asthma interventions that adequately acknowledge COVID-19 and are responsive to the changing home environment and change home routines resulting from this pandemic.

**Johnsrude,
Christopher
L.**

**Sullivan,
Janice**

Physical activity in Catecholaminergic Polymorphic Ventricular Tachycardia

University of British Columbia

\$1,000.00

Catecholaminergic Polymorphic Ventricular Tachycardia (CPVT) is a rare inherited arrhythmia disorder characterized by ventricular tachycardia typically triggered by exercise and emotions in the presence of a structurally normal heart. The goal of this study is to determine whether there is an association between physical activity levels and ventricular arrhythmias in pediatric CPVT patients. The study will determine if increased levels of physical activity are associated with improved outcomes in CPVT. The study involves data collection, exercises tests, accewlerometry, physical activity trackers, and questionnaires throughout the 1 year study.

**Total New
Awards
April/May
2021:**

\$188,588.00

MAY PUBLICATIONS HIGHLIGHTS

Congratulations to the CIEHS members with articles published in the month of March! 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. Ferragut Cardoso AP, **Banerjee M**, Nail AN, Lykoudi A, **States JC**. miRNA Dysregulation is an Emerging Modulator of Genomic Instability. *Semin Cancer Biol.* 2021 May 9;S1044-579X(21)00132-2. doi: 10.1016/j.semancer.2021.05.004. Epub ahead of print. PMID: [33979676](#).
Impact Statement: *Induction of genomic instability and dysregulation of miRNAs, are both key processes involved in carcinogenesis. However, how these two processes interact is only beginning to be understood. This review summarizes the literature evidence supporting a causal role of miRNA dysregulation in generating genomic instability and consequently carcinogenesis. Current knowledge gaps and possible approaches to address them are also discussed.*
2. **Banerjee M**, Ferragut Cardoso A, Al-Eryani L, Pan J, Kalbfleisch TS, Srivastava S, **Rai SN, States JC**. Dynamic alteration in miRNA and mRNA expression profiles at different stages of chronic arsenic exposure-induced carcinogenesis in a human cell culture model of skin cancer. *Arch Toxicol.* 2021 May 25. doi: 10.1007/s00204-021-03084-2. Epub ahead of print. PMID: [34032870](#).
Impact Statement: *Skin cancer is a well-known outcome of chronic environmental arsenic exposure, but the molecular mechanisms are not well understood. This investigation examined the changes in gene expression in a longitudinal study using a well-established cell line model of chronic arsenic exposure-induced squamous cell carcinoma and RNA-seq. The results reveal that the landscape of differentially expressed mRNA and the miRNAs regulating those mRNAs change considerably during cancer development and provide novel insight into the molecular events leading to skin cancer chronic from arsenic exposure.*
3. Huang S, Wang J, Men H, Tan Y, Lin Q, Gozal E, Zheng Y, **Cai L**. Cardiac metallothionein overexpression rescues diabetic cardiomyopathy in Akt2-knockout mice. *J Cell Mol Med.* 2021 May 30. doi: 10.1111/jcmm.16687. Epub ahead of print. PMID: [34053181](#).
Impact Statement: *Akt2 play important role in the glucose metabolism of the heart, but its function is down-regulated under diabetic condition. The new study shows that although we previously showed that metallothionein (MT) preserved Akt2 activity along with the prevention of diabetic cardiomyopathy, but, in the absence of Akt2 gene MT may stimulate alternative or Akt2 downstream pathways to protect from diabetic cardiomyopathy. This may provide a new strategy to prevent diabetic complications.*
4. Morrissey SM, Geller AE, Hu X, Tieri D, Ding C, Klaes CK, Cooke EA, Woeste MR, Martin ZC, Chen O, Bush SE, Zhang HG, Cavallazzi R, Clifford SP, Chen J, Ghare S, Barve SS, **Cai L**, Kong M, Rouchka EC, McLeish KR, Uriarte SM, Watson CT, **Huang J**, Yan J. A specific low-density neutrophil population correlates with hypercoagulation and disease severity in hospitalized COVID-19 patients. *JCI Insight.* 2021 May 10;6(9):148435. doi: 10.1172/jci.insight.148435. PMID: [33986193](#).
Impact Statement: *Our data suggest that a subset of low density neutrophil population contributes to COVID-19-associated coagulopathy, systemic inflammation, and acute respiratory distress syndrome . The frequency of this neutrophil subset in the circulation could serve as an adjunct clinical marker to monitor disease status and progression.*
5. Tevis DS, Flores SR, Kenwood BM, Bhandari D, Jacob P 3rd, Liu J, Lorkiewicz PK, **Conklin DJ**, Hecht SS, Goniewicz ML, Blount BC, De Jesús VR. Harmonization of acronyms for volatile organic compound metabolites using a standardized naming system. *Int J Hyg Environ Health.* 2021 May 4;235:113749. doi: 10.1016/j.ijheh.2021.113749. Epub ahead of print. PMID: [33962120](#).
Impact Statement: *Increased interest in volatile organic compound (VOC) exposure has led to an increased need for consistent, systematic, and informative naming of VOC metabolites. Harmonizing the naming of VOC metabolites will lead to more uniform dissemination of knowledge regarding VOC exposures and their relationships with public health.*
6. **DuPre NC**, Karimi S, Zhang CH, Blair L, Gupta A, Alharbi LMA, Alluhibi M, Mitra R, McKinney WP, Little B. County-level demographic, social, economic, and lifestyle correlates of COVID-19 infection and death trajectories during the first wave of the pandemic in the United States. *Sci Total Environ.* 2021 May 3;786:147495. doi: 10.1016/j.scitotenv.2021.147495. Epub ahead of print. PMID: 33971599; PMCID: [PMC8091799](#).
Impact Statement: *This study identifies and maps counties with similar COVID-19 epidemic curves and highlights that communities with higher proportions of youth, communities of color, smokers, and workers in healthcare, service and goods industries can reduce viral spread by targeting vaccination programs to these populations and increasing access and education on non-pharmaceutical interventions.*
7. Xu Q, Liu Y, Cepulis D, Jerde A, Sheppard RA, Tretter K, Oppy L, Stevenson G, Bishop S, Clifford SP, Liu P, Kong M, **Huang J**. Implementing an Electronic Hand Hygiene System Improved Compliance in the Intensive Care Unit. *Am J Infect Control.* 2021 May 27;S0196-6553(21)00383-7. doi: 10.1016/j.ajic.2021.05.014. Epub ahead of print. PMID: [34052312](#).
Impact Statement: *A sensor-based electronic hand hygiene system improved hand hygiene compliance in the ICU. Significant variations among providers in terms of hand hygiene compliance. Hand rubbing duration in partial compliance occurrences did not change significantly over time.*

MAY PUBLICATIONS HIGHLIGHTS CONTINUED

8. Song K, Xu Q, Knott VH, Zhao CB, Clifford SP, Kong M, Slaughter MS, Huang Y, **Huang J**. Liposomal Bupivacaine-Based Erector Spinae Block for Cardiac Surgery. *J Cardiothorac Vasc Anesth*. 2021 May;35(5):1555-1559. doi: 10.1053/j.jvca.2020.09.115. Epub 2020 Sep 20. PMID: [33046362](#).
Impact Statement: *Liposomal bupivacaine-based single-shot bilateral erector spinae block could reduce total opioid consumption intraoperatively, as well as at 4 and 12 hours after extubation in cardiac surgery.*
9. Gu Z, Li F, Liu Y, Jiang M, Zhang L, He L, Wilkey DW, **Merchant M**, Zhang X, Deng ZB, **Chen SY**, Barve S, McClain CJ, Feng W. Exosome-Like Nanoparticles From *Lactobacillus rhamnosus* GG Protect Against Alcohol-Associated Liver Disease Through Intestinal Aryl Hydrocarbon Receptor in Mice. *HepatoL Commun*. 2021 Feb 5;5(5):846-864. doi: 10.1002/hep4.1679. PMID: 34027273; PMCID: [PMC8122379](#).
Impact Statement: *Alcohol use disorders will effect nearly 1 in 7 Americans across their lifespan and contribute to more than 85,000 deaths annually. Wenke Feng, PhD, Professor of Medicine and his collaborators including some in the CIEHS, demonstrated that small exosome-like nanoparticles purified from *Lactobacillus rhamnosus* GG (LGG) growth cultures can protect the gut and the liver from alcohol-induced, bacterial endotoxin damage. Probiotics, such as LGG, represent an important part of a healthy lifestyle, are freely available for over-the-counter purchase, and may be one approach to mitigate the damaging effects of alcohol abuse.*
10. Teng Y, Xu F, Zhang X, Mu J, Sayed M, Hu X, Lei C, Sriwastva M, Kumar A, Sundaram K, Zhang L, **Park JW**, **Chen SY**, Zhang S, Yan J, **Merchant ML**, Zhang X, McClain CJ, Wolfe JK, Adcock RS, Chung D, Palmer KE, Zhang HG. Plant-derived exosomal microRNAs inhibit lung inflammation induced by exosomes SARS-CoV-2 Nsp12. *Mol Ther*. 2021 May 11:S1525-0016(21)00257-4. doi: 10.1016/j.ymthe.2021.05.005. Epub ahead of print. PMID: 33984520; PMCID: [PMC8110335](#).
Impact Statement: *COVID-19 is a disease affecting the pulmonary system with devastating inflammation. Our results show that a tiny nanovesicles called exosomes released from SARS-CoV-2 infected lung epithelia cells are preferentially taken up by lung macrophages that subsequently induce lung inflammation. Ginger exosome-like nanoparticles (GELNs) miRNA inhibits the SARS-CoV-2 induced lung inflammation and viral replication. Therefore, GELNs are a potential therapeutic agent to treat COVID-19.*
11. Guardiola JJ, Hardesty JE, Beier JL, **Prough RA**, McClain CJ, **Cave MC**. Plasma Metabolomics Analysis of Polyvinyl Chloride Workers Identifies Altered Processes and Candidate Biomarkers for Hepatic Hemangiosarcoma and Its Development. *Int J Mol Sci*. 2021 May 11;22(10):5093. doi: 10.3390/ijms22105093. PMID: 34065028; PMCID: [PMC8150673](#).
Impact Statement: *The results of this study help us understand why vinyl chloride causes liver cancer in chemical plant workers. Some of the blood tests we identified could possibly be used to test at-risk workers for cancer.*
12. O'Brien SJ, Kalbflesich T, Srivastava S, Pan J, **Rai S**, Petras RE, Ronquillo N, Polk HC Jr, Galandiuk S. Decreased Tumoral Expression of Colon-Specific Water Channel Aquaporin 8 Is Associated With Reduced Overall Survival in Colon Adenocarcinoma. *Dis Colon Rectum*. 2021 May 13. doi: 10.1097/DCR.0000000000002071. Epub ahead of print. PMID: [33990498](#).
Impact Statement: *In collaboration with Dr. Galandiuk, we explore gene signatures for overall survival in colon adenocarcinoma on The Cancer Genome Atlas data repository. We find that Low AQP8 expression is a risk factor for worse overall survival in colon cancer patients.*
13. Linder MW, Egger ME, Van Meter T, **Rai SN**, Valdes R Jr, Hall MB, Wu X, Alghamdi N, Chesney JA. Longitudinal Relationship between Idylla Plasma ctBRAF V600 Mutation Detection and Tumor Burden in Patients with Metastatic Melanoma. *Mol Diagn Ther*. 2021 May 10. doi: 10.1007/s40291-021-00528-4. Epub ahead of print. PMID: [33970440](#).
Impact Statement: *In collaboration with Dr. Linder, we find statistically significant relationship between changes in plasma ctDNA and radiographic imaging among patients with metastatic melanoma. This can supplement early detection of progression and relapse in this population.*
14. Majid S, Keith RJ, Fetterman JL, Weisbrod RM, Nystoriak J, Wilson T, Stokes AC, Blaha MJ, **Srivastava S**, Robertson RM, **Bhatnagar A**, Hamburg NM. Lipid profiles in users of combustible and electronic cigarettes. *Vasc Med*. 2021 May 20:1358863X211009313. doi: 10.1177/1358863X211009313. Epub ahead of print. PMID: [34013801](#).
Impact statement: *The present study provides insights into the associations of novel tobacco product use with known markers of cardiovascular health. Importantly, when compared to never users, we found use of there earlier generation of electronic cigarettes with and without combustible cigarette use to be associated with lower levels of HDL cholesterol and higher triglycerides*

JUNE PUBLICATIONS HIGHLIGHTS

Congratulations to the CIEHS members with articles published in the month of April! 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. Reynolds LM, Zamora C, Lee UJ, Stokes AC, Benjamin EJ, **Bhatnagar A**, Payne TJ, Rodriguez CJ. Tobacco Use Prevalence and Transitions From 2013 to 2018 Among Adults With a History of Cardiovascular Disease. *J Am Heart Assoc.* 2021 Jun 9:e021118. doi: 10.1161/JAHA.121.021118. Epub ahead of print. PMID: [34102851](#).
Impact Statement: *This study shows that even though it is well known that smoking is bad for your heart, even those with heart disease continue to smoke. Less than 10% of those with heart disease enroll in tobacco cessation programs, although some switch to e-cigarette.*
2. Wang X, Chen XX, Yu HT, Tan Y, Lin Q, Keller BB, Zheng Y, **Cai L**. Engineered cardiac tissues: a novel in vitro model to investigate the pathophysiology of mouse diabetic cardiomyopathy. *Acta Pharmacol Sin.* 2021 Jun;42(6):932-941. doi: 10.1038/s41401-020-00538-8. Epub 2020 Oct 9. PMID: 33037406; PMCID: [PMC8149662](#).
Impact Statement: *Rodent diabetic models, used to understand the pathophysiology of diabetic cardiomyopathy (DCM), remain several limitations. Engineered cardiac tissue (ECT) with 3D in vitro heart model was used to investigate the structural and functional effect of advanced glycation end-products (AGEs), as the most important pathogenic factor for DCM's development; This study shows the first time that AGEs-treated murine ECTs recapitulate the key features of DCM's functional, structural, cellular, and molecular pathogenesis as observed in the heart of diabetic mice. This approved that this ex vivo model can be used to investigate cellular structure-function relationships, signaling pathways relevant to DCM and pharmaceutical intervention strategies.*
3. Gozal E, Jagadapillai R, **Cai J**, Barnes GN. Potential Crosstalk between Sonic Hedgehog-Wingless-related Integration Site Signaling and Neurovascular Molecules: Implications for Blood Brain Barrier Integrity in Autism Spectrum Disorder. *J Neurochem.* 2021 Jun 25. doi: 10.1111/jnc.15460. Epub ahead of print. PMID: [34169527](#).
Impact Statement: *Autism spectrum disorder (ASD) is a neurodevelopmental disease and its pathogenesis may be attributed to gene-environment interactions. There are no definitive mechanisms explaining how environmental triggers can lead to ASD although brain inflammation, immunity, and oxidative stress are involved. The blood brain barrier (BBB) plays a critical role in controlling brain homeostasis and immune response. The permissive BBB opens the 'gate' for environmental 'saboteurs' and trigger the pathological events in ASD. In this review, the authors examined the current knowledge on Sonic Hedgehog/Wingless-related integration site (Shh/Wnt) pathways and their roles in BBB function in ASD. The interactions between Wnt-b-catenin and Shh pathways are critical to maintain BBB integrity in the mature brain to prevent influx of pathogens and inflammatory cells. Disruption of the Shh/Wnt crosstalk may compromise the BBB development and function. The ASD patients with genetic mutations of key components of these pathways show severe ASD symptoms. Mechanisms involving ASD-related mutations of Shh/Wnt signaling cause BBB leaks and neuroinflammation, suggesting the BBB integrity plays a vital role in gene-environment interactions in ASD pathogenesis.*
4. Lei C, Teng Y, He L, Sayed M, Mu J, Xu F, Zhang X, Kumar A, Sundaram K, Sriwastva MK, Zhang L, **Chen SY**, Feng W, Zhang S, Yan J, **Park JW**, **Merchant ML**, Zhang X, Zhang HG. Lemon exosome-like nanoparticles enhance stress survival of gut bacteria by RNase P-mediated specific tRNA decay. *iScience.* 2021 May 5;24(6):102511. doi: 10.1016/j.isci.2021.102511. PMID: 34142028; PMCID: [PMC8188359](#).
Impact Statement: *Since most of the probiotic bacteria currently available in the market belong to the genera Lactobacillus and overcoming bile salt damage to probiotics is a great challenge. In this study, a tiny nanoparticle called exosomes-like nanoparticles (ELNs) isolated from lemon significantly increased the percentage of lactobacillaceae in the presence of bile. This finding is significant because we daily consume a variety of plant-derived products which contain ELNs in our diet. Our findings provide a foundation to further determine whether other types of ELNs also contribute to enhance the survivability of probiotics in gut in general.*
5. Lin Q, Huang Z, Cai G, Fan X, Yan X, Liu Z, Zhao Z, Li J, Li J, Shi H, Kong M, Zheng MH, **Conklin DJ**, Epstein PN, Wintergerst KA, Mohammadi M, **Cai L**, Li X, Li Y, Tan Y. Activating Adenosine Monophosphate-Activated Protein Kinase Mediates Fibroblast Growth Factor 1 Protection From Nonalcoholic Fatty Liver Disease in Mice. *Hepatology.* 2021 Jun;73(6):2206-2222. doi: 10.1002/hep.31568. PMID: 32965675; PMCID: [PMC8082952](#).
Impact statement: *Although fibroblast growth factor 1 (FGF1) protects against nonalcoholic fatty liver disease in type 2 diabetic and obese mice, but its clinically translational study was limited mainly because its hyperproliferation has potentially tumorigenic risk, to overcome which, we engineered an FGF1 (i.e., FGF1ΔHBS) that dramatically diminished its proliferative potential, yet maintains full metabolic activity of wild-type FGF1. This new FGF1ΔHBS is approved effective for preventing and reversing liver steatosis and steatohepatitis by activating AMPK via hepatocyte FGFR4, and also potentially applied towards clinical use.*

JUNE PUBLICATIONS HIGHLIGHTS CONTINUED

6. Saha S, Roy P, **Corbitt C**, Kakar SS. Application of Stem Cell Therapy for Infertility. *Cells*. 2021 Jun 28;10(7):1613. doi: 10.3390/cells10071613. PMID: [34203240](#).
Impact statement: Infertility affects about 15% of couples globally. Conventional therapies and assisted reproductive technologies (e.g., in vitro fertilization) are effective for many but not all cases. This review explains new fertility treatment possibilities using stem cell therapies, many of which are in clinical trials now.
7. Tang W, Liu H, Wei P, **Huang J**, Lyu W, Zhou H, Zhou J, Li Y, Li J. Decrease in cerebral oxygen saturation and the increase in heart rate is a prewarning window of hypotension after spinal anesthesia for cesarean section: A pilot observational study. *J Clin Anesth*. 2021 Jun 1;73:110360. doi: 10.1016/j.jclinane.2021.110360. Epub ahead of print. PMID: [34087657](#).
Impact Statement: We identified that decrease in cerebral oxygen saturation and increase in heart rate can predict hypotension after spinal anesthesia in pregnant patients for C Section.
8. Tibi P, McClure RS, **Huang J**, Baker RA, Fitzgerald D, Mazer CD, Stone M, Chu D, Stammers AH, Dickinson T, Shore-Lesserson L, Ferraris V, Firestone S, Kisson K, Moffatt-Bruce S. STS/SCA/AmSECT/SABM Update to the Clinical Practice Guidelines on Patient Blood Management. *Ann Thorac Surg*. 2021 Jun 8;S0003-4975(21)00556-7. doi: 10.1016/j.athoracsur.2021.03.033. Epub ahead of print. PMID: [34217505](#).
Impact Statement: A multidisciplinary panel of experts was convened by STS, which includes members of the Society of Cardiovascular Anesthesiologists (SCA), the American Society of ExtraCorporeal Technology (AmSECT), and the Society for the Advancement of Blood Management (SABM), to review the latest data on patient blood management and to update the 2011 Update to The Society of Thoracic Surgeons and the Society of Cardiovascular Anesthesiologists Blood Conservation Clinical Practice Guidelines.
9. Dukka H, Byrd P, Qian C, Baughman G, Butt S, **Rai SN**. Occupational percutaneous injuries and exposures in a dental teaching environment: A 10-year report. *J Dent Educ*. 2021 Jun 27. doi: 10.1002/jdd.12731. Epub ahead of print. PMID: [34180052](#).
Impact statement: Occupational percutaneous injuries (PIs) are an ongoing issue that occurs globally, especially in an academic environment and are woefully underreported. Our results showed that uncovered dental burs and needlesticks continue to be the predominant cause of PIs in a teaching environment. Collection and reporting of such events could be useful in observing any trends and implementation of corrective actions to prevent such injuries, which could lead to potential cross infections.
10. Zierold KM, Myers JV, Brock GN, Sears CG, **Sears LL**, Zhang CH. Nail Samples of Children Living near Coal Ash Storage Facilities Suggest Fly Ash Exposure and Elevated Concentrations of Metal(loid)s. *Environ Sci Technol*. 2021 Jul 6;55(13):9074-9086. doi: 10.1021/acs.est.1c01541. Epub 2021 Jun 16. PMID: [34132542](#).
Impact statement: The effect of coal ash exposure on children's health is not known but is a concern due to the potential toxins contained in the coal-power-plant byproduct. The study found an increased heavy metal body burden in children living near coal ash storage sites indicating an increased risk for potential neurotoxic exposure from metals contained in coal ash.
11. Bushau-Sprinkle AM, Barati MT, Zheng Y, **Watson WH**, Gagnon KB, Khundmiri SJ, Kitterman KT, Clark BJ, Siskind LJ, Doll MA, Brier ME, Coventry S, Lederer ED. Na/H Exchange Regulatory Factor 1 Deficient Mice Show Evidence of Oxidative Stress and Altered Cisplatin Pharmacokinetics. *Antioxidants (Basel)*. 2021 Jun 28;10(7):1036. doi: 10.3390/antiox10071036. PMID: [34203453](#).
Impact statement: Cisplatin is an effective cancer treatment drug, but up to one third of patients must stop taking this drug because of kidney toxicity. This paper identifies NHERF1 as a protein that protects against cisplatin nephrotoxicity by altering the redox environment of the kidney.

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