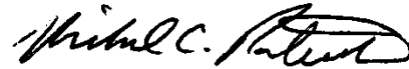


Date of Preparation: Sept. 6, 2022



Signature

Michael C. Petriello, PhD
Tenure Track

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EDUCATION	DATES
Graduate: PhD: Toxicology, University of Kentucky, Lexington/KY Baccalaureate: Muhlenberg College, Allentown/PA, BS, Biology/Environmental Science	05/2015 05/5010
POSTGRADUATE TRAINING <i>University of Kentucky, Postdoctoral Fellow</i> <i>U.S. Dept. of Veterans Affairs, WOC researcher</i> <i>Harvard Medical School (Boston Children's Hospital). Visiting Scientist</i>	2015-2019 2016-2019 2016-2018
FACULTY APPOINTMENTS <i>Assistant Professor, Institute of Environmental Health Sciences, Wayne State University</i> <i>Tenure Retreat Appointment: Assistant Professor, Department of Pharmacology, School of Medicine, Wayne State University</i> <i>Adjunct Appointment: Assistant Professor, C.S. Mott Center for Human Growth and Development, Department of Obstetrics and Gynecology, School of Medicine, Wayne State University</i>	08/2019 08/2019 04/2022
MAJOR PROFESSIONAL SOCIETIES <i>Society of Toxicology</i>	2012-current

<p>HONORS/AWARDS</p> <p><i>Keystone Symposia Future of Science Fund Awardee</i> National Heart, Lung, and Blood Institute, Atherosclerosis: Lessons Learned and Concepts Challenged Taos, New Mexico</p> <p>Society of Toxicology Cardiovascular Toxicology Specialty Section Postdoctoral Award Society of Toxicology 56th Annual Meeting Baltimore, Maryland</p> <p>European Atherosclerosis Society (EAS) Best Poster Award 2015 Annual Meeting Innsbruck, Austria</p> <p>NIEHS Paper of the Month Petriello MC, Hoffman JB, Sunkara M, Wahlang B, Perkins JT, Morris AJ, Hennig B. 2016. Dioxin-like pollutants increase hepatic flavin containing monooxygenase (FMO3) expression to promote synthesis of the pro-atherogenic nutrient biomarker trimethylamine N-oxide from dietary precursors. J Nutr Biochem 33:145-153.</p> <p>Presidential Scholarship Environmental Toxicology Muhlenberg College</p> <p>Dean's Grant Scholarship recipient for independent summer research Environmental Toxicology Muhlenberg College</p> <p>Merck Scholar Summer Research Award Environmental Toxicology Muhlenberg College</p>	<p>02/2018</p> <p>03/2017</p> <p>05/2016</p> <p>09/2016</p> <p>09/2010</p> <p>03/2009</p> <p>05/2008</p>
<p>SERVICE</p> <p><u>Wayne State University</u> Departmental/Divisional IEHS Faculty Search Committee</p> <p>IEHS Research Infrastructure Committee</p> <p>Pharmacology graduate student recruitment committee (co-chair)</p> <p>IEHS CURES member- environmental modulators of metabolism and metabolic disease interest group member</p> <p>IEHS CLEAR P42 Superfund working group member- Biomedical Project 2 member</p>	<p>09/2021-Current</p> <p>10/2021-Current</p> <p>10/2019-Current</p> <p>10/2019-Current</p> <p>08/2019-Current</p>

IEHS 2020 environmental health sciences core centers annual meeting planning and scientific Review Committees. Chair of Early Stage Investigator Planning Committee and host of Day 1 of Annual P30 meeting.	11/2019-July 2020
IEHS/Pharmacology/IBio faculty candidate recruitment (3 interviews)	09/2019-Current
School of Medicine IBS Recruitment Committee Member	10/2021-Current
University IBio research working group member	08/2019-Current
UPG or Other Physician Practice Plan NONE	
Affiliate Medical Organizations NONE	
Professional Michigan Society of Toxicology annual meeting poster judge	10/18/2019
Community NONE	
Consulting NONE	
Scholarly Service Grant Review Committees National/International External reviewer for NIEHS P30 Pilot projects: University of Louisville, University of California Davis 2022/10 ZDK1 GRB-2 (O1) 1 Fellowships in Diabetes Endocrinology and Metabolic Diseases NIH Study Section Regional/Local NONE Service for Peer-Reviewed Journals Editorship NONE Editorial Board Membership <i>Journal of Nutritional Biochemistry</i> - Board of Editors <i>Toxics</i> - Board of Editors	 2021 06/21/2022- 06/22/2022 2018-Current 2020-Current

<p>Review of Manuscripts Within the past year; <i>Journal of Hazardous Materials</i> (1) <i>Toxics</i> (3) <i>Acta Pharmaceutica Sinica B</i> (2) <i>Placenta</i> (1) <i>Environmental Health Perspectives</i> (1) <i>PLOS ONE</i> (1) <i>Chemical Research in Toxicology</i> (1) <i>Drug Metabolism Reviews</i> (1)</p> <p>Journals reviewed for in the past; <i>Food and Chemical Toxicology</i> <i>Reviews on Environmental Health</i> <i>Metabolites</i> <i>Environment International</i> <i>Journal of Nutritional Biochemistry</i> <i>Biomedicine and Pharmacotherapy</i> <i>Journal of Hazardous Materials</i> <i>Toxicology and Applied Pharmacology</i> <i>Chemical Research in Toxicology</i> <i>Environmental Pollution</i> <i>Chemosphere</i> <i>Toxicology</i> <i>Environmental Health Perspectives</i> <i>PLOS ONE</i> <i>Chemical Research in Toxicology</i> <i>Drug Metabolism Reviews</i></p>	
<p>Other Scholarly Service Chair of the PFAS working group; MI ECHO</p>	8/7/2020 - Current
<p>Other Service NONE</p>	
<p>TEACHING</p> <p>Teaching at Wayne State University</p> <p>Within the past year: Graduate students: Lecturer, Principles of Toxicology (PHC 7410), 3 Lectures; “Cardiovascular Toxicology I and II” and “Environmental Impacts on Gut Microbiota”.</p> <p>Lecturer, Principles of Environmental Health (FPH 7410), 1 Lecture; “Environmental Modulators of Metabolic Disease”.</p>	<p>11/8/21,11/10/21, 11/12/21</p> <p>11/3/2021</p>

Co-Course Director, Pharmacology Seminar Series (PHC 7890).	Winter 2021
Course Director, Teratology (PSL 7730), Lectured, ran journal clubs, oversaw grant writing sessions, and completed all course grading.	Fall 2021
Lecturer, Current Research Topics in Reproductive Sciences (PSL 7775), 1 Lecture; “Environmental Impact on Pregnancy”.	4/13/2021
Lecturer, Principles of Reproductive Biology (PSL 7690), 1 Lecture; “Gut Microbiota and Pregnancy”.	12/1/2021
Medical students: Lecturer, MD1 Normal Structure and Function of the Cardiopulmonary Systems (c/o 2025), 3 Lectures; “Pharmacological Regulation of Cardiac Rate & Rhythm”, “Pharmacological Regulation of Cardiac Function”, and “Vascular Pharmacology”.	9/30/2021, 10/5/2021, 10/5/2021
Lecturer, M1 and M2 Pharmacovigilance and Synergy Sessions.	9/6/22, 5/17/22, 6/21/2021, 7/26/2021, 8/13/2021, 9/9/2021, 10/25/2021, 12/8/2021, 12/9/2021
From January 2020- December 2020	
Graduate students: Lecturer, Principles of Toxicology (PHC 7410), 2 Lectures; “Cardiovascular Toxicology” and “Environmental Impacts on Gut Microbiota”.	11/6/2020, 11/13/2020
Lecturer, Principles of Environmental Health (FPH 7410), 3 Lectures; “Scope of Environmental Health”, and “Environmental Modulators of Metabolic Disease” (twice).	1/8/2020, 3/25/2020, 11/17/2020
Co-Course Director, Pharmacology Seminar Series (PHC 7890).	2020-2021
Medical students: Lecturer, MD1 Normal Structure and Function of the Cardiopulmonary Systems (c/o 2024), 3 Lectures;	10/7/2020, 10/9/2020,

<p>“Pharmacological Regulation of Cardiac Rate & Rhythm”, “Pharmacological Regulation of Cardiac Function”, and “Vascular Pharmacology”.</p> <p>Lecturer, M1 and M2 Pharmacovigilance Sessions 6 Sessions.</p> <p>From August 2019- December 2019 Graduate students: Lecturer, Principles of Toxicology (PHC 7410), Lecture entitled, “Cardiovascular Toxicology”.</p>	<p>10/15/2020</p> <p>12/9/2020, 12/4/2020, 10/22/2020, 9/25/2020, 8/3/2020, 6/8/2020</p> <p>11/6/2019</p>
<p>Teaching at Other Institutions Graduate Students:</p> <p>Lecturer, Precision Nutrition Within A Lifecourse Epidemiological Framework (NUTR596), University of Michigan, Lecture entitled, “Gut microbiota-derived metabolites and health”.</p>	<p>3/9/2021</p>
<p>Mentorship</p> <p>Wayne State University</p> <p>Zhao Yang – Postdoctoral Fellow; Chair of Protein Interactions and Binding Discussion Group at Experimental Biology 2021</p> <p>Katherine Roth – Postdoctoral fellow; OVPR Faculty Competition for Postdoctoral Fellows award recipient, 47th Annual Midwest Pharmacology Colloquium Poster Award</p> <p>Manisha Agarwal- PhD student, Department of Pharmacology, Mentor</p> <p>Samantha Heldman- Rotating PhD student, Department of Pharmacology</p> <p>Stephanie Morgan- Medical student, c/o 2024; Medical Student Research Fellowship 2021</p> <p>Laimar Garmo- PhD student, Department of Pharmacology, Co- mentor; Izabela Podgorski Primary mentor.</p>	<p>11/2019-Current</p> <p>12/2019-Current</p> <p>1/2020-Current</p> <p>9/2020-12/2020</p> <p>11/2020-Current</p> <p>12/2020-Current</p>

<p>University of Kentucky</p> <p>Tyler Gripshover- post-baccalaureate trainee. Currently PhD student at University of Louisville; Advisor- Matthew Cave</p>	<p>2018-2019</p>
<p>Essays/Theses/Dissertations Directed</p> <p>Alyssa Gill – MS Basic Medical Sciences (BMS) essay committee member; “ The Effects of PFAS on the Human Body”.</p> <p>Christine Chien- MS Basic Medical Sciences (BMS) essay committee member; “Review of the Effects of Organic Solvents and Noise on Hearing Loss”.</p> <p>Andrew Cecil - MS Basic Medical Sciences (BMS) essay committee member; “Sulforaphane Treatment of Behavioral and Neurodegenerative Diseases”.</p> <p>Akhilesh Munagala - MS Basic Medical Sciences (BMS) essay committee member; “Potential disease states due to impact of neonatal antibiotic administration on gut microbiota”.</p> <p>Sameen Jaffry - MS Basic Medical Sciences (BMS) essay committee member; “Preterm birth rates due to air pollution in relation to Detroit, Michigan populations: Examination of sulfur dioxide, nitrogen dioxide, particulate matter, and ozone”.</p> <p>Patrick Fakhoury - MS Basic Medical Sciences (BMS) essay committee member; “Benzene and Insulin Resistance”.</p>	<p>Completed (A); 4/28/20</p> <p>Completed (A); 4/28/20</p> <p>Completed (A); 4/27/20</p> <p>Completed (A); 5/5/21</p> <p>Completed (A); 12/17/21</p> <p>In process</p>
<p>Course or curriculum development</p> <p>Teratology (PSL 7730). Newly organized team-taught course.</p>	<p>Fall 2021</p>

GRANTS, CONTRACTS, AND OTHER FUNDING

Active National/International Grants and Contracts

Role: **Principal Investigator**, Percent Effort: 5%,

Co-Is: Samuel Zilioli

Title: “PFAS and Cardiovascular Risk among African American Adults: A Prospective Investigation of Putative Biological Mechanisms.”

The goal of this grant is to determine if PFAS associate with CVD risk factors in Detroit residents

Source: ACHIEVE GreatER Pilot

9/01/22- 08/31/23

Total Direct Costs: \$40,000

Role: **Principal Investigator**, Percent Effort: 35%; R00ES028734-01A1

Co-Is:

Title: "TMAO is a biomarker of dioxin-like pollutant exposure and cardiometabolic disease."

The primary objective is to determine if the microbiota-derived metabolite TMAO is a mechanism linking exposures to dioxin-like pollutants and cardiometabolic disease risk.

Source: NIH/NIEHS

9/2019-7/2022

Total Direct Costs: \$485,067

Role: **Principal Investigator**, Percent Effort: 5%,

Co-Is: Phil Levy

Title: "Impact of PFAS pollutant exposures on cardiovascular disease markers in African American residents of Detroit and interventions with Statins."

The goal of this grant is to determine if lipid lowering therapy reduces the toxicity of PFAS in mice and humans.

Source: DMC Foundation

12/01/21- 11/30/22

Total Direct Costs: \$41,000

Role: **Principal Investigator**, Percent Effort: 10%

ECHO OIF

Co-Is: Douglas Ruden (WSU), Andrea Cassidy-Bushrow (HFHS), Kimberly McKee, Jackie Goodrich (UofM).

Title: "Impacts of environmental chemical exposures on gut microbiota and microbiota-derived metabolites in mothers and children." The major goal of this study is to determine if PFAS exposures during pregnancy modulate maternal gut microbiota and the trajectory of microbiota development in the offspring.

Source: NIH

9/01/2021 - 8/31/2023

Total Direct Costs: \$128,235

Role: **Subcontract PI**, Percent Effort: 0%

Co-Is: Jackie Goodrich (UofM) and Courtney Carignan (MSU)

Title: "Exposure to perfluoroalkyl substances (PFAS) and maternal antibody response." The major goal of this study is to determine if PFAS exposures during pregnancy modulate antibody response to Covid-19 vaccination.

Source: NIH

7/01/2021 - 6/30/2022

Total Direct Costs: \$37,500

Role: **Principal Investigator**, Percent Effort: 0%;

Co-Is: Lauren Petrick (Mt. Sinai) and Jackie Goodrich (UofM)

Title: "Impact of PFAS exposures on endogenous metabolites in Michigan mothers."

The primary objective of this Pilot and Feasibility study from the Human Health Exposure Analysis Resource (HHEAR) is to measure PFAS and metabolites from maternal serum from 100 Michigan mothers in a single LC-MS/MS run.

Source: NIH/HHEAR
 6/29/2021-6/28/2022
 Total Direct Costs: Estimated at \$25,000

Role: **Co-Investigator**, Percent Effort: 0%
MPI: Paul Stemmer (WSU) and Heather Gibson (WSU)
 Title: “Determinants of Mercury-Induced Disease Identified Using Diversity Outbred Mice.”
 This competitive award from the NIEHS-funded P30 Environmental Health Sciences Core Center at Wayne State University is focused on phosphoproteomics and mercury exposure.
 Source: NIH/NIEHS/CURES Pilot
 10/01/2021-3/31/2023
 Total Direct Costs: \$65,000

Active Other Grants and Contracts
 NONE

Pending National/International Grants and Contracts

Role: **Co-Investigator**, Percent Effort: 13%
 NIEHS RIVER (R35)
PI: Rick Pilsner (WSU).
 Title: “Environmental Determinants of Novel Biomarkers of Male Fertility and Reproductive Success.”
 The primary goals of the R35 are to identify novel biomarkers that accurately predict male fecundity and fertility and to determine how these biomarkers are impacted by environmental exposures.
 Source: NIH/NIEHS
 4/01/2023 - 3/31/2031
 Total Direct Costs: \$6,467,212

Role: **Co-Investigator**, Percent Effort: 20%
 R01
PI: Suresh Palaniyandi (WSU/HFHS).
 Title: “Pollutants exacerbate HFpEF by modulating oxidative stress and pro-resolution mechanisms.”
 The primary objective of the study is to investigate the effect of dioxin like pollutant, PCB 126 in inducing liver damage and thereby aggravating heart failure with preserved ejection fraction (HFpEF).
 Source: NIH
 4/01/2023 - 3/31/2028
 Total Direct Costs: \$2,387,610

Role: **Co-Investigator**, Percent Effort: 15%
 R01
PI: Chris Kassotis (WSU).
 Title: “Mechanisms underlying metabolic disruption potential of unconventional oil and gas chemicals and mixtures.”
 The primary objective is to mechanistically interrogate metabolic disruption in rodents gestationally

exposed to a mixture of unconventional oil and gas chemicals and identify causal pathways through which these complex chemical mixtures induce health effects at environmentally relevant concentrations.

Source: NIH

4/01/2023 - 3/31/2028

Total Direct Costs: \$3,781,684

Role: **Principal Investigator**, Percent Effort: 35%

ESI Katz R01

Co-Is: Douglas Ruden, Charlie Fehl, Katherine Gurdziel, Gil Mor (WSU)

Title: "PFAS increases susceptibility to infection-mediated PTB."

The major goal of this ESI Katz grant is to study mechanisms linking PFAS exposures to increased risk of infection-mediated preterm birth with a focus on the interferon pathway.

Source: NIH

2/1/2023 - 1/31/2028

Total Direct Costs: \$2,196,134

Role: **Co-Investigator**, Percent Effort: 5% project B2, 10% RETCC

Superfund Research Program (P42)

PIs: Melissa Runge-Morris and Carol Miller (WSU).

Title: "Center for Leadership in Environmental Awareness and Research".

The primary objective is to understand and mitigate VOC-related health issues with a specific focus on preterm birth and maternal inflammation. Five integrative environmental science and engineering and biomedical research projects (E1, E2, B1, B2, B3), supported by five cores, will investigate toxic mechanisms, exposure pathways, biomarkers, and strategies to prevent exposures and improve public health outcomes.

Source: NIH/NIEHS

4/01/2022 - 3/31/2027

Total Direct Costs: \$13,175,442

Role: **Co-Investigator**, Percent Effort: 5%

R01. **9th Percentile Score**

PI: Gil Mor (WSU).

Title: "Impact of benzene-induced MIA on fetal T cell development."

The primary goal of the study is to determine if benzene impacts on fetal differentiation of B and T cells and increases susceptibility to viral infections.

Source: NIH

9/01/2023 - 8/31/2028

Total Costs: \$1,529,435

Pending Other Grants and Contracts

NONE

Previously Funded Grants and Contracts

Role: **Multiple Principal Investigator**, Percent Effort: 0%

Co-PI: Wanqing Liu

Title: "PFAS and Liver Injuries at Different Developmental Stages: A Genomic Approach."

This competitive award from the NIEHS-funded P30 Environmental Health Sciences Core Center at Wayne State University is focused on impacts of PFAS exposure on NAFLD using mouse models and clinical studies.

Source: NIH/NIEHS/CURES Pilot

10/01/2020-3/31/2022

Total Direct Costs: \$65,000

Role: **Co-Investigator**, Percent Effort: 0%

PI: Izabella Podgorski

Title: “Effects of PFAS exposure on bone microenvironment: implications for bone-metastatic prostate cancer.”

This competitive award from the NIEHS-funded P30 Environmental Health Sciences Core Center at Wayne State University is focused on PFAS-mediated bone metastasis.

Source: NIH/NIEHS/CURES Pilot

10/01/2020-3/31/2022

Total Direct Costs: \$65,000

Role: **Principal Investigator and mentor**, Percent Effort: 0%,

Co-Is:

Title: “Impact of halogenated persistent organic pollutants on gut microbiota health and cardiometabolic disease- Postdoctoral Support for Katherine Roth”

The primary objective is to provide postdoctoral salary support for Katherine Roth to study the impacts of PFAS exposures on disease endpoints.

Source: Wayne State University OVPR

12/2019-11/2021

Total Direct Costs: \$60,000

Role: **Principal Investigator**, Percent Effort: 75%; K99ES028734-01A1

Co-Is: Andrew Morris (KY), Susan Smyth (KY), Richard Charnigo (KY)

Title: “TMAO is a biomarker of dioxin-like pollutant exposure and cardiometabolic disease.”

The primary objective is to provide mentored career development support and to determine if the microbiota-derived metabolite TMAO is a mechanism linking exposures to dioxin-like pollutants and cardiometabolic disease risk.

Second year of funding was deferred as the transition to independent phase (R00) occurred in 2019.

Source: NIH/NIEHS

08/2018-8/2019

Total Direct Costs: \$88,700

Role: **Principal Investigator**, Percent Effort: 75%; IK2BX004590-01

Co-Is: Andrew Morris (KY), Susan Smyth (KY), Richard Charnigo (KY)

VA-CDA 2

Title: “Exposure to Dioxin-like pollutants increases cardiometabolic disease risk through FMO3 mediated mechanisms.”

The major goal is to test the hypothesis that increased FMO3 expression/activity is a mechanism linking exposure to dioxin-like pollutants to increased risk of cardiometabolic disease in highly exposed populations such as active and retired military personnel.

Although chosen for funding, overlap of this grant with the K99/R00 prevented start of award.

Source: Department of Veterans Affairs
 10/2018-9/2023
 Total Direct Costs: \$600,000

Role: **Postdoctoral Fellow**, Percent Effort: 100%; 5T32HL091812-08

Co-Is: Andrew Morris (KY), Susan Smyth (KY)

Title: "Clinical Scholars in Cardiovascular Science."

The goal of this program is to prepare clinical scholars to assume leadership positions directing research in the field of cardiovascular medicine.

Source: NIH/NHLBI

09/2016-8/2018

Total Direct Costs: ~\$100,000

Role: **Graduate Student Fellow**, Percent Effort: 100%; 13PRE15860000

Co-Is: Bernhard Hennig (KY), Andrew Morris (KY)

American Heart Association predoctoral fellowship

Title: "Novel Methodologies to Study Anti-Inflammatory Nitro-Fatty Acids."

The goal of this American Heart Association Great Rivers Affiliate Predoctoral Fellowship project was to provide mentored training in analytical chemistry and to investigate the role of fatty acid modifications in disease.

Source: American Heart Association

07/2013-06/2015

Total Direct Costs: \$50,000

Role: **Graduate Student Training Grant Fellow**, Percent Effort: 100%; 5T32ES007266-22

Co-Is: Mary Vore (KY), Bernhard Hennig (KY)

Title: "Training Grant in Molecular Mechanisms of Toxicity."

The goal of this program is to educate and train scientists for research and education in academia, government and industry emphasizing cardiovascular disease, neurodegenerative disease, and cancer.

Source: NIH/NIEHS

06/2011-06/2013

Total Direct Costs: \$50,000

Previously Submitted, Not Funded Grants and Contracts

Role: **Sponsor/Mentor**, Percent Effort: 0%;

Co-Is: Katherine Roth, Wanqing Liu (WSU)

Title: "Exposure to PFAS mixtures accelerate atherosclerosis via mechanisms related to gut microbiota and cholesterol metabolism.

Source: NIH/NIEHS

7/01/2022 - 6/30/2024

Total Direct Costs: \$132,384

Role: **Co-Investigator**, Percent Effort: 2%

Group (IMPAACT). Network (NO1-HD-3-3345)

Site PI: Gil Mor

Title: "Effect of air pollution on maternal inflammation and fetal development."

The primary objective is to evaluate the toxicity of airborne exposure to benzene during pregnancy with specific focuses on the maternal gut microbiota, placental inflammation and fetal development

Source: DMC Foundation

10/2020-9/2021

Total Direct Costs: \$96,847

Role: **Co-Investigator**, Percent Effort: 10%

ViCTER R01

PI: Andrea Cassidy-Bushrow (HFHS).

Title: "PFAS exposure, gut microbiota function and cardiometabolic health in early life: a Midwest transdisciplinary consortium."

The primary objective is to evaluate the effects of gestational PFAS exposures on gut microbiota and cardiometabolic health of offspring.

Source: NIH/NIEHS

8/01/2021 - 7/30/2024

Total Wayne State University Subcontract: \$676,996.00

Role: **Principal Investigator**, Percent Effort: 35%

ESI Katz R01

Co-Is: Douglas Ruden, Charlie Fehl, Gil Mor (WSU)

Title: "PFAS modulates Interferon beta expression to increase preterm birth risk." The major goal of this ESI Katz grant is to study mechanisms linking PFAS exposures to increased risk of preterm delivery.

Source: NIH/NIEHS

12/21/2021 - 12/20/2026

Total Direct Costs: \$3,128,105.00

Role: **Co-Investigator**, Percent Effort: 5-10%

New Cohorts for Environmental Exposures and Cancer Risk (CEEER; UG3/UH3)

PI: Michele Cote (WSU).

Title: "Mixtures Of TOxicants With Neoplastic Potential (MOTOWN): The Detroit Cohort."

The primary objective is to recruit a cohort of 1,500 African Americans between the ages of 35 and 55 years who have not yet developed cancer and to evaluate common environmental chemicals and how they impact the body through inflammation, stress, and aging.

Source: NIH

9/01/2021 - 8/31/2027

Total Direct Costs: \$8,866,261.00

Role: **Principal Investigator**, Percent Effort: 35%

NIEHS R01

Co-Is: Wanqing Liu, Chris Kassotis, (WSU)

Title: "PFAS accelerates atherosclerosis through modulation of bile acid metabolism." The major goal of this R01 grant is to study mechanisms linking PFAS exposures to increased risk of atherosclerosis.

Source: NIH/NIEHS

7/01/2022 - 6/30/2027

Total Direct Costs: \$2,516,198.00

CLINICAL TRIALS ACTIVITIES

NONE

PATENTS

NONE

PUBLICATIONS**Peer-Reviewed Publications****Reports of Original Work**

1. Martenies SE, Zhang M, Corrigan AE, Kvit A, Shields T, Wheaton W, Bastain TM, Breton CV, Dabelea D, Habre R, Magzamen S, Padula AM, Him DA, Camargo CA Jr, Cowell W, Croen LA, Deoni S, Everson TM, Hartert TV, Hipwell AE, McEvoy CT, Morello-Frosch R, O'Connor TG, **Petriello M**, Sathyanarayana S, Stanford JB, Woodruff TJ, Wright RJ, Kress AM; program collaborators for Environmental influences on Child Health Outcomes. Associations between combined exposure to environmental hazards and social stressors at the neighborhood level and individual perinatal outcomes in the ECHO-wide cohort. *Health Place*. 2022 Jul;76:102858. doi: 10.1016/j.healthplace.2022.102858. PMID: 35872389. *Manuscript writing and editing*.
2. Roy B*, Yang Z*, Pan G, Roth K, Agarwal M, Sharma R, **Petriello MC**[#], Palaniyandi SS[#] (**shared corresponding authorship**). Exposure to the Dioxin-like Pollutant PCB 126 Afflicts Coronary Endothelial Cells via Increasing 4-Hydroxy-2 Nonenal: A Role for Aldehyde Dehydrogenase 2. *Toxics*. 2022; 10(6):328. <https://doi.org/10.3390/toxics10060328>. *manuscript writing. Data analysis, funding*
3. Yang Z, Stemmer PM, **Petriello MC**. Proteomics-Based Identification of Interaction Partners of the Xenobiotic Detoxification Enzyme FMO3 Reveals Involvement in Urea Cycle. *Toxics*. 2022 Jan 28;10(2):60. doi: 10.3390/toxics10020060. PMID: 35202247. *Study conception, manuscript writing. Data analysis, funding*.
4. **Petriello MC**, Mottaleb MA, Serio TC, Balyan B, Cave MC, Pavuk M, Birnbaum LS, Morris AJ. Serum concentrations of legacy and emerging per- and polyfluoroalkyl substances in the Anniston Community Health Surveys (ACHS I and ACHS II). *Environ Int*. 2022 Jan;158:106907. doi: 10.1016/j.envint.2021.106907. Epub 2021 Nov 8. PMID: 34763231. *Study conception, manuscript writing. Data analysis*.
5. Roth K, Yang Z, Agarwal M, Liu W, Peng Z, Long Z, Birbeck J, Westrick J, Liu W, **Petriello MC**. Exposure to a mixture of legacy, alternative, and replacement per- and polyfluoroalkyl substances (PFAS) results in sex-dependent modulation of cholesterol metabolism and liver injury. *Environ Int*. 2021 Dec;157:106843. doi: 10.1016/j.envint.2021.106843. Epub 2021 Aug 31. PMID: 34479135. *Study conception, manuscript writing. Data analysis, funding*.
6. Hoffman JB, **Petriello MC**, Morris AJ, Mottaleb MA, Sui Y, Zhou C, Wang C, Hennig B. Prebiotic inulin consumption reduces dioxin-like PCB 126-mediated hepatotoxicity and gut dysbiosis in hyperlipidemic Ldlr deficient mice. *Envi Pol*. 2020 June; 261: Article 114183. *Study conception, manuscript writing. Data analysis*.

7. Mottaleb MA, **Petriello MC**, Morris AJ: High throughput UHPLC MS/MS measurement of Per and Poly Fluorinated Alkyl Substances (PFAS) in human serum. *J Anal Toxicol.* 2019 Nov 27. PMID: 31776573. *Study conception, manuscript writing, data analysis*
8. Deng P, Hoffman JB, **Petriello MC**, Wang CY, Li XS, Kraemer MP, Morris AJ, Hennig B: Dietary inulin decreases circulating ceramides by suppressing neutral sphingomyelinase expression and activity in mice. *J Lipid Res.* 2019 Oct 11. PMID: 31604806. *Study conception, manuscript writing.*
9. Chen S, Henderson A, **Petriello MC**, Romano KA, Gearing M, Miao J, Schell M, Sandoval-Espinola WJ, Tao J, Sha B, Graham M, Crooke R, Kleinridders A, Balskus EP, Rey FE, Morris AJ, Biddinger SB: Trimethylamine N-Oxide Binds and Activates PERK to Promote Metabolic Dysfunction. *Cell Metab.* 2019 Dec 3;30(6):1141-1151. PMID: 31543404. *Study conception, manuscript writing, data analysis.*
10. AlSiraj Y, Chen X, Thatcher SE, Temel RE, Cai L, Blalock E, Katz W, Ali HM, **Petriello M**, Deng P, Morris AJ, Wang X, Lusis AJ, Arnold AP, Reue K, Thompson K, Tso P, Cassis LA. XX sex chromosome complement promotes atherosclerosis in mice. *Nat Commun.* 2019 Jun 14;10(1):2631. PMID: 31201301. *Study conception, manuscript writing, data analysis.*
11. Wang C, **Petriello MC**, Zhu B, Hennig B. PCB 126 induces monocyte/macrophage polarization and inflammation through AhR and NF- κ B pathways. *Toxicology and applied pharmacology.* 2019 Mar 15;367:71-81. PMID: 30768972. *Study conception, manuscript writing.*
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15. **Petriello MC**, Brandon JA, Hoffman J, Wang C, Tripathi H, Abdel-Latif A, Ye X, Li X, Yang L, Lee E, Soman S, Barney J, Wahlang B, Hennig B, Morris AJ,: Dioxin-like PCB 126 increases systemic inflammation and accelerates atherosclerosis in lean LDL receptor deficient mice. *Toxicological Sciences.* 2018 Apr 1;162(2):548-558. PMID: 29216392.
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20. Perkins JT, **Petriello MC**, Li Hennig B: An open sourced statistical application for identifying complex toxicological interactions of environmental pollutants. *Reviews on Environmental Health*. 2016 Mar 1; 32(1-2): 23-26. PMID: 28118146. *Study conception, manuscript writing*
21. Wahlang B, **Petriello MC**, Perkins JT, Shen S, Hennig B: Polychlorinated biphenyl exposure alters the expression profile of microRNAs associated with vascular diseases. *Toxicology In Vitro*. Sep;35:180-753. PMID: 27288564. *Study conception, manuscript writing*.
22. **Petriello MC**, Hoffman J, Sunkara, Wahlang B, Perkins JT, Morris AJ, Hennig B: Dioxin-like pollutants increase hepatic flavin containing monooxygenase (FMO3) expression to promote synthesis of the pro-atherogenic nutrient biomarker Trimethylamine N-oxide from dietary precursors. *Journal of Nutritional Biochemistry*. Jul;33:145-53. PMID: 27155921
23. Kang S, Lee JS, Lee HC, **Petriello MC**, Kim BY, Do JT, Lim D, Lee HG, Han SG: Phytoncide decreases LPS-induced inflammatory responses in bovine mammary epithelial cells. *Journal of Microbiology and Biotechnology*. 2016 Mar;26(3):579-87. PMID: 26608166. *manuscript writing*
24. Liu D, Perkins JT, **Petriello MC**, Hennig B: Exposure to coplanar PCBs induces endothelial cell inflammation through epigenetic regulation of NF- κ B subunit p65. 2015 Dec 15;289(3):457-65. PMID: 26519613. *Study conception, manuscript writing*
25. Murphy MO, **Petriello MC**, Han SG, Sunkara M, Morris AJ, Esser K, Hennig B: Exercise protects against PCB-induced inflammation and associated cardiovascular risk factors. *Environ Sci Pollut Res Int*. 2016 Feb;23(3):2201-11. PMID: 25586614. *Study conception, manuscript writing*
26. **Petriello MC**, Han SG, Newsome B, Hennig B: PCB 126 toxicity is modulated by cross-talk between caveolae and Nrf2 signaling. 2014 Jun 1;277(2):192-9. PMID: 24709675.
27. **Petriello MC**, Newsome B, Han SG, Murphy M, Eske K, Sunkara M, Morris A, Hennig B: Green tea diet decreases PCB 126-induced oxidative stress in mice by upregulating antioxidant enzymes. *Journal of Nutritional Biochemistry*. 2014 Feb;25(2):126-35. PMID: 24378064
28. Kelsey JW, Slizovskiy IB, **Petriello MC**, Butler KL.: Influence of plant-earthworm interactions on SOM chemistry and *p,p'*-DDE bioaccumulation. *Chemosphere*. 2011 May;83(7):897-902. PMID: 21421253

Case Reports

NONE

Review Articles

1. Roth K and **Petriello MC**. Exposure to per- and polyfluoroalkyl substances (PFAS) and type 2 diabetes risk. *Front. Endocrinol*. 2022 Aug. Research Topic: Environmental stressors and metabolic disease. doi:10.3389/fendo.2022.965384. *Manuscript writing*
2. Yang Z, Roth K, Agarwal M, Liu W, **Petriello MC**. The transcription factors CREBH, PPAR α , and FOXO1 as critical hepatic mediators of diet-induced metabolic dysregulation. *J Nutr Biochem*. 2021 Sep;95:108633. doi: 10.1016/j.jnutbio.2021.108633. Epub 2021 Mar 28. PMID:

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3. Roth K, Imran Z, Liu W, **Petriello MC**. Diet as an exposure source and mediator of Per- and Polyfluoroalkyl Substance (PFAS) toxicity. *Front. Toxicol.* 2020 Dec; 4;2. DOI; 10.3389/ftox.2020.601149. *manuscript writing*.
4. Miller CJ, Runge-Morris M, Cassidy-Bushrow A, Straughen JK, Dittrich TM, Baker TR, **Petriello MC**, Mor G, Ruden DM, O'Leary BF, Teimoori S, Tummala CM, Heldman S, Agarwal M, Roth K, Yang Z, Baker BB. A review of volatile organic compound contamination in post-industrial urban centers: reproductive health implications using a Detroit lens. *Int J Environ Res Public Health.* 2020 Nov; 25;17(23):8755. *manuscript writing*.
5. Deng P, Li X, **Petriello MC**, Wang C, Morris AJ, Hennig B. Application of metabolomics to characterize environmental pollutant toxicity and disease risks. *Rev Environ Health.* 2019 Sep 25;34(3):251-259. PMID: 31408434. *manuscript writing*
6. Hennig B, **Petriello MC**, Gamble MV, Surh YJ, Kresty LA, Frank N, Rangkadilok N, Ruchirawat M, Suk WA. The role of nutrition in influencing mechanisms involved in environmentally mediated diseases. *Rev Environ Health.* 2018 Mar 28;33(1):87-97. PMID: 29381475 *manuscript writing*
7. Hoffman JB, **Petriello MC**, Hennig B. Impact of nutrition on pollutant toxicity: an update with new insights into epigenetic regulation. *Rev Environ Health.* 2017 Mar 1;32(1-2):65-72. PMID: 28076319. *manuscript writing*
8. **Petriello MC**, Hoffman J, Morris AJ, Hennig B: Emerging roles of xenobiotic detoxification enzymes in metabolic diseases. *Rev Environ Health.* 2017 Mar 1;32(1-2):105-110. PMID: 27837601.
9. Perkins JT, **Petriello MC**, Newsome B, Hennig B: Polychlorinated biphenyls and links to cardiovascular disease. *Environ Sci Pollut Res Int.* 2016 Feb;23(3):2160-72. PMID: 25877901. *manuscript writing*
10. **Petriello MC**, Newsome B, Dziubla TD, Hilt JZ, D Bhattacharyya, Hennig B: Modulation of persistent organic pollutant toxicity through nutritional intervention: emerging opportunities in biomedicine and environmental remediation. *Sci total environ.* 2014 Sep 491-492: 11-16. PMID: 24530186
11. **Petriello MC**, Newsome B, Hennig B: Influence of nutrition in PCB-induced vascular inflammation. *Environmental Science Pollution Research.* 2014 May;21(10):6410-8. PMID: 23417440

Editorials/Commentaries

NONE

Letters to the Editor

NONE

Book Authorships, Editorships, and Chapters

1. Hennig B, **Petriello MC**, Newsome BJ, Perkins JT, Liu D. Antioxidant therapy against persistent organic pollutants and associated diseases. In: *Nutritional antioxidant therapies: Treatments and perspectives*, Chapter 9, pp 217-246, 2017

Published Abstracts

1. Hennig B, **Petriello MC**. Healthful nutrition as a modifier of environmental pollutant-induced inflammatory diseases: Implications in Atherosclerosis. *Atherosclerosis*. 2019 August; 287:e268-269.
2. Hoffman J, Petriello MC, Barney J, Deng P, Flythe M, Hennig B. Prebiotic fiber (inulin) attenuates PCB 126-induced disruption of gut microbiota and host metabolism. *Journal of the Academy of Nutrition and Dietetics*. October 2018 118(10): A150.

Non-Peer-Reviewed Publications

NONE

PRESENTATIONS

Podium Presentations (refereed)

1. **Petriello MC**.: Legacy and Emerging Halogenated Pollutants Modulate Gut Microbiota and Accelerate Atherosclerosis. *ESI spotlight webinar*, May 11, 2022; Virtual; Hosted by NIEHS.
2. Morgan S, **Petriello MC**.: Cardiovascular disease biomarkers are associated with PFAS and mixtures of halogenated pollutants in the Anniston community health survey. *FLUOROS Global*, October 5, 2021; South Kingstown, RI.
3. Morgan S, **Petriello MC**.: Associations of cardiovascular disease risk factors with PFAS and mixtures of halogenated pollutants in the Anniston community health survey II (ACHS II). *DIOXIN 2021 Annual Meeting*, November 10, 2021; Tianjin, China.
4. Roth K, **Petriello MC**.: Exposure to a mixture of legacy, alternative, and emerging PFAS results in sex-dependent modulation of liver injury and cholesterol metabolism. *Metabolic Disease Interest Group*, December 2021; Detroit, MI.
5. Agarwal M, **Petriello MC**.: Meat-based diet and pollutants increase the risk for cardiovascular disease. *Graduate Research Symposium 3 minute thesis*, March 2021; Detroit, MI.
6. **Petriello MC**.: Emerging roles of xenobiotic detoxification enzymes in metabolic diseases. *Lipids@Wayne Seminar Series*. Wayne State University, February 19, 2020; Detroit, MI.
7. **Petriello MC**.: Impacts of halogenated persistent organic pollutants on gut microbiota-derived metabolites and cardiometabolic disease. *Pharmaceutical Sciences Seminar Series*. Wayne State University, January 15, 2020; Detroit, MI.
8. **Petriello MC**.: Impacts of persistent organic pollutant exposures on gut microbiota health and host inflammation across the lifespan. *Reproductive Sciences Seminar Series*. Wayne State University Mott Center, December 13, 2019; Detroit, MI.

9. **Petriello MC.:** Serum concentrations of legacy and emerging per- and polyfluoroalkyl substances in the Anniston Community Health Surveys (ACHS I and ACHS II). *Dioxin Annual Meeting 2019*, August 27, 2019; Kyoto, Japan.
10. **Petriello MC.:** Effect of Lifestyle-Based Lipid-Lowering Interventions on the Relationship between Circulating Levels of Per- and Poly-Fluorinated Chemicals and Serum Cholesterol. *SOT Annual Meeting 2019*, March 12, 2019; Baltimore, MD.
11. **Petriello MC.:** Dioxin-like PCB 126 increases systemic inflammation and accelerates atherosclerosis in lean LDL receptor deficient mice. *CEECH 2018*, June 11, 2018; Krakow, Poland.
12. **Petriello MC.:** Serum levels of dioxin-like pollutants are positively associated with the cardiometabolic disease risk biomarker Trimethylamine-N-oxide in leaner women residing in Anniston, Alabama. *SRP Annual Meeting 2018*, December, 2017; Philadelphia, PA.
13. **Petriello MC.:** Positive associations between serum levels of dioxin-like pollutants and the cardiometabolic disease risk biomarker TMAO in residents of Anniston, Alabama. *Dioxin 2017*, August, 2017; Vancouver, Canada.
14. **Petriello MC.:** Interactions between diet and toxicant exposure lead to increased circulating levels of the cardiometabolic disease biomarker TMAO. *NIEHS Fest*, December 2016; Durham, NC.
15. **Petriello MC.:** Interactions between environmental pollution and nutrition-based biomarkers of metabolic disease risk in residents of Anniston, Alabama. *Dioxin 2016*, August, 2016; Florence, Italy.
16. **Petriello MC.:** Plasma levels of the pro-atherogenic nutrient biomarker TMAO is increased by exposure to Dioxin-like pollutants through upregulation of FMO3. *European Atherosclerosis Society*, May, 2016; Innsbruck, Austria
17. **Petriello MC.:** Exposure to dioxin-like pollutants increases plasma levels of the cardiovascular risk biomarker TMAO through upregulation of FMO3. *CEECH 2016*, April 2016; Prague, Czech Republic.
18. **Petriello MC.:** Exposure to dioxin-like pollutants increases plasma levels of the cardiovascular risk biomarker TMAO through upregulation of FMO3. *OVSOT Annual Meeting*, November 13 2015; Northern Kentucky University.
19. **Petriello MC.:** Healthful nutrition can protect against environmental pollutant-induced inflammation. *SRP Annual Meeting*, November 2014; San Jose, CA.
20. **Petriello MC.:** PCB 126-induced endothelial toxicity is modulated by cross-talk between caveolae and NRF2 signaling. *34th International Symposium on Halogenated Persistent Organic Pollutants (Dioxin 2014)*, September 3, 2014; Madrid, Spain.
21. **Petriello MC.:** Dietary supplementation with green tea polyphenols decreases PCB-induced hepatotoxicity and oxidative stress in mice by upregulating antioxidant genes. *The Central and Eastern European Conference on Health and the Environment (CEECH)*, May 28, 2014; Cluj-Napoca, Romania.
22. **Petriello MC.:** Nutritional modulation of environmental pollutant toxicity: Implications for risk assessment. *Society of Environmental Toxicology and Chemistry Europe Annual Meeting*, May 13, 2014; Basel, Switzerland
23. **Petriello MC.:** Successful nutritional modulation of polychlorinated biphenyl toxicity. *Society of Environmental Toxicology and Chemistry Annual Meeting*, November 21, 2013; Nashville, TN
24. **Petriello MC.:** Polychlorinated biphenyl toxicity is mediated through the cross-talk of Caveolin-1 and Nrf2. *Superfund Research Program Annual Meeting*, October 16, 2013; Baton Rouge, LA

25. **Petriello MC.**: The role of fatty acid modifications in PCB-induced endothelial dysfunction. *South East Lipid Research Conference Annual Meeting*, September 29, 2012; Pine Mountain, GA

Poster Presentations (refereed)

1. Roth, K., Yang, Z., Agarwal, M., Liu, W., Peng, Z., Long, Z., Liu, W., **Petriello, M.**: Exposure to a Mixture of Legacy, Alternative, and Replacement Per- and Polyfluoroalkyl Substances (PFAS) Modulates Lipid Metabolism in Normo- and Hypolipidemic Mice. *FLUOROS Global*, October 2021; Virtual.
2. Roth, K., Yang, Z., Agarwal, M., Liu, W., Peng, Z., Long, Z., Liu, W., **Petriello, M.**: Exposure to a Mixture of Legacy and Emerging Per- and Polyfluoroalkyl Substances (PFAS) Modulates Lipid Metabolism in Mice. *47th Annual Midwest Pharmacology Colloquium*, June 2021; Virtual.
3. Roth, K., Lui, W., Peng, Z., **Petriello, M.**: Exposure to a mixture of legacy and emerging per- and polyfluoroalkyl substances (PFAS) modulates lipid metabolism in mice. *Society of Toxicology 60th Annual Meeting*, March 2021; Virtual.
4. Agarwal M, **Petriello MC.**: Loss of FMO3 protects mice against dioxin-like PCB-induced inflammation. *47th Annual Midwest Pharmacology Colloquium*. June 2021. Virtual
5. Yang, Z., **Petriello, M.** Discovery of Protein-protein Interaction Partners of FMO3 and relationship with cell signaling pathways. *Experimental Biology (EB) Meeting*. April 2021. Virtual.
6. Ding J, Maxwell A, Sadagurski M, Debarba L, Ruden D, **Petriello MC**, Mor G. Benzene exposure during pregnancy leads to fetal resorption and intrauterine growth retardation. *NIEHS 2020 Superfund Research Program Annual Meeting*. December 2020.
7. **Petriello MC**, Kraemer M, Mottaleb A, Morris AJ.: Effect of lifestyle based lipid lowering interventions on the relationship between circulating levels of per and polyfluorinated chemicals and serum cholesterol. *NIEHS 2019 Superfund Research Program Annual Meeting*, November 18, 2019; Seattle, WA
8. **Petriello MC.**: Exposure to dioxin-like pollutants increases plasma levels of the cardiovascular risk biomarker TMAO through upregulation of FMO3. *Society of Toxicology Annual Meeting, March 2016; New Orleans, LA.*
9. **Petriello MC**, Morris AJ, Hennig B: Nitration of linoleic acid prevents polychlorinated biphenyl-induced endothelial cell dysfunction. *Society of Toxicology Annual Meeting*, March 24, 2015; San Diego, California.
10. **Petriello MC**, Sunkara M, Hennig B, Morris A: Novel high resolution methodologies to study anti-inflammatory nitro-fatty acids. *ATVB annual meeting*, May 1, 2014; Toronto, Canada.
11. **Petriello MC**, Han SG, Hennig B: Loss of Caveolin-1 protects against PCB-induced vascular dysfunction by upregulating Nrf2 and the antioxidant response. *Society of Toxicology Annual Meeting*, March 24, 2014; Phoenix, Arizona.
12. **Petriello MC**, Murphy M, Eske K, Newsome B, Hennig B.: Nutritional modulation of polychlorinated biphenyl toxicity. *15th International Conference of the Pacific Basin Consortium for Environment and Health*, September 23, 2013; Honolulu, Hawaii

13. **Petriello MC**, Han SG, Hennig B: Exposure to the environmental pollutant, PCB 126, initiates inflammation and cellular dysfunction and can be regulated through cross-talk of caveolae and Nrf2 signaling. *52nd Annual Society of Toxicology Annual Meeting*, March 13, 2013; San Antonio, Texas
14. **Petriello MC**, Han SG, Hennig B.: Exposure to PCB 126 triggers cellular defense through cross-talk of caveolae and Nrf2 signaling. *25th Annual Superfund Research Program Annual Meeting*, October 22, 2012; Raleigh, North Carolina
15. **Petriello MC**, Murphy M, Eske K, Newsome B, Hennig B.: Overexpression of Caveolin-1 Promotes Atherosclerosis Through Increased Vascular Cell Adhesion Molecule-1 Expression in Primary Vascular Endothelial Cells. *51st Annual Society of Toxicology Annual Meeting*, March 12, 2012; San Francisco, CA
16. **Petriello MC**, Murphy M, Eske K, Newsome B, Hennig B.: Overexpression of Caveolin-1 Increases Vascular Cell Adhesion Molecule-1 Expression in Primary Vascular Endothelial Cells. *24th Annual Superfund Basic Research Program Annual Meeting*, October 24, 2011; Lexington, KY
17. **Petriello MC & Hennig B**: Overexpression of Caveolin-1 Increases Vascular Cell Adhesion Molecule-1 Expression in Primary Vascular Endothelial Cells. *Ohio Valley Society of Toxicology (OVSOT) Annual Meeting*, September 23, 2011; Dayton, OH

Other

NONE

Invited Lectures/Presentations

International/National

1. **Petriello MC**, Carignan C, Goodrich J, Ruden D. “PFAS Working Group update and future planning”. Virtual. CHARM All Investigator Annual Meeting. May 26, 2022
2. **Petriello MC**. “From trainee to tenure track faculty”. Virtual. UK-SRC Alumni Webinar. April 20, 2022
3. **Petriello MC**. “Impacts of pollutant exposures during pregnancy on gut microbiota function and birth weight”. Virtual. ECHO CHARM lay audience talk. June 22, 2021
4. **Petriello MC**. “Cardiovascular disease and PCBs”. EPA task force Webinar. February 25, 2016