MELISSA A. FURLONG, PHD
Curriculum Vitae
Community, Environment and Policy
Mel and Enid Zuckerman College of Public Health
University of Arizona
mfurlong@email.arizona.edu

CHRONOLOGY OF EDUCATION

2012- 2016 Doctor of Philosophy (Epidemiology)
University of North Carolina at Chapel Hill, Chapel Hill, NC
Advisor: Stephanie Engel, PhD
Dissertation title: *Prenatal exposure to organophosphorus pesticides and childhood neurodevelopmental phenotypes*

2008- 2010 Master of Public Policy
Duke University, Durham, NC

2003- 2007 Bachelor of Science (Psychology with a Concentration in Neuroscience)
Duke University, Durham, NC

CHRONOLOGY OF EMPLOYMENT

Sep 2020- Assistant Professor of Environmental Health Sciences
Department of Community, Environment, and Policy
Mel and Enid Zuckerman College of Public Health, University of Arizona, Tucson, AZ
2016-2020 Postdoctoral Fellow, Environmental Health Sciences
Mel and Enid Zuckerman College of Public Health, University of Arizona, Tucson, AZ
Advisor: Paloma Beamer, PhD
External Co-Advisor: Beate Ritz, MD, PhD, University of California at Los Angeles
2013-2016 National Institute of Environmental Health Sciences Ruth L. Kirschstein Training Grant Trainee
2013-2016 Special Volunteer, National Institute of Environmental Health Sciences (NIEHS) 2010-2011
2011-2012 Research Assistant, University of North Carolina Sensory Experiences Project
2010-2011 Associate in Research, Duke University Program on Global Health and Technology Access
2007-2008 Paralegal, Legal Aid of NC, Farmworker's Unit and Battered Immigrant Project
2006-2007 Research Assistant, Duke University Department of Neurobiology

HONORS AND AWARDS

2020 Finalist, University of Arizona Outstanding Postdoctoral Scholar Award
2019 University of Arizona College of Pharmacy PostDoc Data Blitz, Second Place
2018-2023 NIEHS Pathway to Independence Award (K99/R00)
2012-2013 University of North Carolina Graduate School: Merit Fellowship
2007 Duke University: Howard Hughes Seminar and Award for Undergraduate Research
2006 Duke University: Dean's Summer Undergraduate Research Fellowship
2005 National Science Foundation: Research Experience for Undergraduates at CMU

SERVICE/OUTREACH

National/International Outreach

Peer Reviewer - Journals

American Journal of Epidemiology, JAMA Pediatrics, Environmental Health Perspectives, International Journal of Obesity, Environment International, Environmental Research, Child Development, NeuroToxicology, Neurotoxicity Research, Journal of Occupational and Environmental Hygiene, Journal of Paediatric and Perinatal Epidemiology, Environmental Health, Environmental Pollution, International Journal of Hygiene and Environmental Health, International Journal of Environmental and Occupational Health, Archives of Environmental and Occupational Health, Environmental Monitoring and Assessment

Peer Reviewer – Grants (National and International)

2023 NIH Study Section, Neurological, Mental and Behavioral Health Study Section, June 2023 (Ad hoc reviewer)
2023 NIOSH NY/NJ (Region II) Education and Research Center (ERC) 2023 Pilot Project
2021 Reviewer, Swiss National Science Foundation, December 2021
2021 NIH Study Section, Neurological, Aging, Musculoskeletal Epidemiology Panel (NAME), July 2021 (Ad hoc reviewer)
2021 Reviewer, Fondation Recherche Medicale, June 2021
2021 NIEHS Grant Review, Special Emphasis Panel (Children's Environmental Health and Community Engagement Centers), June 2021

CITIZENSHIP (National)

2022- Firefighter Cancer Cohort Study, Data Center Coordinator Co-Lead
2021-22 Committee Member, Annual NIEHS P30 ESI Session Planning Committee, New York, New York, Virtual)

University Service

2023- UArizona Office for Research, Innovation, and Impact Faculty Foresight Council
2022 - Co-Director, Southwest Environmental Health Sciences Center (P30) Research Focus Group 1: Environmental Exposures in Underserved Southwest Populations

College Service

2022- Mel and Enid Zuckerman College of Public Health Faculty Assembly Chair
2017- Poster Judge, Mel and Enid Zuckerman College of Public Health Research Poster Forum
2020 Co-sponsor, Mel and Enid Zuckerman College of Public Health Environmental Epidemiology Journal Club

Departmental Service

2023 Committee Member, University of Arizona MEZCOPH Search committee, Associate/Full Professor of Maternal and Child Health, Health Promotion Sciences
2020 Committee Member, University of Arizona MEZCOPH Search Committee, Assistant/Associate Professor of Environmental Health Sciences

PUBLICATIONS

[o] indicates student or postdoc mentee

*indicates publication based on work done as a graduate student

1. Bowers, **Furlong**, Ramos. Scope and financial impact of unpublished data and unused samples among U.S. academic and government researchers. iScience, *accepted*.
2. Paul KC, Krolewski RC, Moreno EL, Blank J, Holton KM, Ahfeldt T**, Furlong M,** Yu Y, Cockburn M, Thompson LK, Kreymerman A, Ricci-Blair E, Li YJ, Patel HB, Lee RT, Bronstein J, Rubin L, Khurana V, Ritz B. "Coupling comprehensive pesticide-wide association study to iPSC dopaminergic neuron screening identifies and classifies Parkinson-relevant pesticides". Nature Communications, May 16, 2023. Vol 14 (2803)
3. [o*] Parra KL, Farland L, Harris R, Beamer P, **Furlong MA**. "Associations of prenatal agricultural farm work with fetal overgrowth and pregnancy complications in State of Arizona birth records." Journal of Occupational and Environmental Medicine, May 9, 2023 DOI: 10.1097/JOM.0000000000002877
   selected for inclusion in JOEM's CME Exam
4. Nwanaji-Enwerema J, Cardenas A, Goodrich J, **Furlong M**, Jung A, Collender P, Caban-Martinez A, Calkins M, Navarro K, Graber J, Grant C, Beitel S, Littau S, Urwin D, Gabriel J, Hughes J, Gulotta J, Wallentine D, Burgess J. "Occupational Years of Service and Leukocyte Epigenetic Aging: Relationships in United States Firefighters," Journal of Occupational and Environmental Medicine 65(5):p e312-e318, May 2023. | DOI: 10.1097/JOM.0000000000002817
5. Harber P, **Furlong M**, Stern DA, Morgan WJ, Wright AL, Guerra S, Martinez F. Association of Childhood Respiratory Status with Adult Occupational Exposures in a Birth Cohort. Annals of the American Thoracic Society. Annals of the American Thoracic Society, 20(3), 390-396. PMCID: PMC9993150
6. Pau KC, Kusters C, **Furlong M**, Zhang K, Yu Y, Folle AD, Del Rosario I, Keener A, Bronstein J, Sinsheimer JS, Horvath S, Ritz B. Immune System Disruptions implicated in whole blood epigenome-wide association study of depression among Parkinson's disease patients. Brain, Behavior, & Immunity-Health. 2022 Oct 3, 100530
7. [o] Parra KL, Alexander GE, Raichlen DA, Klimentidis YC, **Furlong MA**. Exposure to air pollution and risk of incident dementia in the UK Biobank. *Environmental Research,* 209, June 2022
8. Goodrich JM, Jung AM, **Furlong MA**, Beitel S, Littau S, Gulotta J, Wallentine D, Burgess JL. Repeat measures of DNA methylation in an inception cohort of firefighters. Occupational and Environmental Medicine, March 24 2022 79(10) 2022;0:1–8. doi:10.1136/oemed-2021-108153
9. Raichlen D, **Furlong M**, Klimentidis Y, Sayre K, Parra K, Bharadwaj P, Wilcox R, Alexander G. Association of Physical Activity with Incidence of Dementia is Attenuated by Air Pollution. Medicine & Science in Sports & Exercise, Feb 08 2022 54(7):1131-1138
10. Chen GK, Yan Q, Paul KC, Kusters CD, Folle AD, **Furlong MA,** Keener A, Bronstein J, Horvath S, Ritz B. Stochastic epigenetic mutations influence Parkinson's Disease Risk, Progression, and Mortality. *Journal of Parkinson's Disease*. February 15 2022 12(2) pp545-556
11. **Furlong MA,** Alexander G, Klimentidis Y, Raichlen D. Association of Air Pollution and Physical Activity With Brain Volumes. *Neurology.* Jan 25 2022 98(4)

12. Yan Q, Paul K, Walker D, **Furlong M**, Del Rosario I, Yu Y, Zhang K, Cockburn M, Jones D, Ritz B. High-resolution metabolomic assessment of pesticide exposure in Central Valley, California. *Chemical Research in Toxicology.* 2021, 34, 5, 1337-1347
13. Goodrich JM, **Furlong MA**, Caban-Martinez AJ, Jung AM, Batai K, Jenkins T, Beitel S, Littau S, Gulotta J, Wallentine D, Hughes J, Popp C, Calkins MM, Burgess JL. Differential DNA Methylation by Hispanic Ethnicity among Firefighters in the United States. *Epigenetics Insights.* Vol 14, March 2021 https://doi.org/10.1177/25168657211006159
14. Vega-Millan C, Devora-Figueroa AD, Burgess J, Beamer P, **Furlong M**, Lantz RC, Meza-Figueroa D, O'Rourke MK, Garcia-Rico L, Meza-Escalante E, de J. Balderas-Cortes, Meza-Montenegro M. Inflammation biomarkers associated with arsenic exposure in drinking water and respiratory outcomes in indigenous children in three Yaqui villages from Sonora, México. *Environmental Science and Pollution Research,* 28, 34355-34366 (2021)
15. **Furlong MA,** Paul K, Yan Q, Cockburn M, Bronstein J, Ritz B. Ambient pyrethroid pesticide exposure in California's Central Valley and Depression In Adult Life. *Environmental Epidemiology* Dec 2020 Vol 4 (6) p e123 doi: 10.1097/EE9.0000000000000123
16. **Furlong MA**, Paul KC, Yan Qi, Chuang YH, Cockburn MG, Bronstein JM, Horvath S, Ritz B. An Epigenome-Wide Association Study of Ambient Pyrethroid Pesticide Exposures in California's Central Valley. *International Journal of Hygiene and Environmental Health.* Volume 229, August 2020, 113569.
17. **Furlong MA,** Klimentidis YC. Associations of Air Pollution With Obesity and Body Fat Percentage, and Modification By Polygenic Risk Score for BMI in the UK Biobank. *Environmental Research.* 185(2020) 109364. June 2020.
18. Garcia-Rico L, Meza-Figueroa D, Beamer P, Burgess J, O'Rourke M, Lantz C, **Furlong M**, Martinez-Cinco M, Mondaca-Fernandez I, Balderas-Cortes J, Meza-Montenegro M. Serum Matrix Metalloproteinase-9 in Children Exposed to Arsenic from Playground Dust at Elementary Schools in Hermosillo, Sonora, Mexico. *Environmental Geochemistry and Health*. 42, 499-511 (2020).
19. López-Gálvez N, Wagoner R, Ornelas-Van Horne Y, **Furlong M,** Avila E, Quirós-Alcalá L, Beamer P. Systematic Literature Review of the Take-Home Route of Pesticide Exposure via Biomonitoring and Environmental Monitoring. *International Journal of Environmental Research and Public Health*, *16(12), 2177,* 2019
20. ***Furlong M**, Deming-Halverson S, Sandler DP. Chronic antibiotic use during adulthood and weight change in the Sister Study. *PLoS ONE* 14(5): e0216959. 2019. https://doi.org/10.1371/journal.pone.0216959
21. Beamer P, **Furlong M**, Lothrop N, Guerra S, Billheimer D, Stern D, Zhai J, Halonen M, Wright A, Martinez F. CC16 Levels Into Adult Life Are Associated With Nitrogen Dioxide Exposure at Birth. *American Journal of Respiratory and Critical Care Medicine (AJRCCM).* 2019 Feb 21. doi: 10.1164/rccm.201808-1488OC
22. López-Gálvez N, Wagoner R, Ornelas-Van Horne Y, **Furlong M,** Avila E, Quirós-Alcalá L, Beamer P. Systematic Review of Take-Home Route of Pesticide Exposure. *Reference Module in Earth Systems and Environmental Sciences*, 27 Feb 2018
23. ***Furlong M,** Herring A, Daniels J, Engel L, Goldman B, Wolff M, Engel S. Early Life Characteristics and Neurodevelopmental Phenotypes in the Mount Sinai Children's Environmental Health Center. *Child Psychiatry and Human Development*, 2017 Nov 24. doi: 10.1007/s10578-017-0773-5. [Epub ahead of print]

24. ***Furlong M,** Engel S, Barr D, Wolff M. Prenatal Pyrethroid Exposures and Associations with Behavior and Executive Functioning in Childhood. *Neurotoxicology*, September 2017 vol 62 pp 231-238 https://doi.org/10.1016/j.neuro.2017.08.005
25. ***Furlong M**, Engel S, Buckley J, Daniels J, Engel L, Goldman B, Barr D, Wolff M, Herring A. Prenatal Exposure to Organophosphorus Pesticides and Childhood Neurodevelopmental Phenotypes. *Environmental Research*, October 2017 vol 158 pp 737-747. https://doi.org/10.1016/j.envres.2017.07.023
26. Ausderau K, Sideris J, Little L, **Furlong M**, Bulluck J, Baranek G. Sensory Subtypes and Associated Outcomes in Children with Autism Spectrum Disorders. *Autism Research*, 2016. doi:10.1002/aur.1626
27. ***Furlong M,** Tanner C, Goldman S, Bhudhikanok G, Blair A, Chade A, Korell M, Hoppin J, Kasten M, Langston J, Marras C, Meng C, Richards M, Ross G, Umbach D, Sandler D, Kamel F. Using Personal Protective Equipment Modifies the Association Between Pesticides and Parkinson's Disease. *Environment International*, 2015 vol 75 pp 144-150.
28. ***Furlong M,** Engel S, Barr D, Wolff M. Prenatal Exposure to Organophosphate Pesticides and Reciprocal Social Behavior in Childhood. *Environment International*, 2014 vol 70 pp 125-131.
29. Ausderau K, **Furlong M**, Sideris J, Bulluck J, Little L, Watson L, Boyd B, Belger A, Dickie V, Baranek, G. Sensory Subtypes in Children With Autism Spectrum Disorder: Latent Profile Transition Analysis Using a National Survey of Sensory Features. *Journal of Child Psychology and Psychiatry*, 2014 vol 55 (8) pp 935-944.
30. Ausderau K, Sideris J, **Furlong M,** Bulluck J, Baranek G. National Survey of Sensory Features of Children With ASD: Factor Structure of the Sensory Experience Questionnaire (3.0). *Journal of Autism and Developmental Disorders*, 2014 44(4) pp 915-925.
31. Watson K, Ghodasra J, **Furlong M,** Platt, M. Visual Preferences for Sex and Status in Female Rhesus Macaques. *Animal Cognition,* 2012 Vol 15(3) pp 401-407.
32. So A, **Furlong M,** Heddini A. Globalization and Antibiotic Resistance. *British Medical Journal*, September 2010. Vol 341 pp 615-616.

WORKS IN PROGRESS (Submitted)

1. **Furlong MA**, Paul K, Parra K, Fournier A, Ellsworth P, Cockburn M, Arellano A, Beamer P, Ritz B. Pre-conception and first trimester exposure to pesticides and associations with stillbirth. *Under review*, American Journal of Epidemiology
2. **Furlong MA,** Lim C, Parra K, Ritter C, Bedrick E, Arora M, Hoover J, Beamer P Ernst K. Associations of Heatwaves During Pregnancy With Apgar Scores at Birth. *Under Review,* Environmental Health Perspectives
3. **Furlong MA,** Liu T, Snider JM, Tfaily MM, Itson C, Beitel S, Parsawar K, Keck K, Galligan J, Walker DI, Gulotta JJ, Burgess JL. Evaluating Changes in Firefighter Urinary Metabolomes After Structural Fires: An Untargeted, High Resolution Approach*. In Revision,* Scientific Reports
4. [o] Jung AM, **Furlong MA**, Goodrich JM, Cardenas A, Beitel SC, Littau SR, Caban-Martinez AJ, Gulotta JJ, Wallentine DD, Urwin D, Gabriel J, Hughes J, Graber JM, Grant C, Burgess JL. Epigenetic clocks and microRNAs among U.S. firefighters. *In revision*, Epigenetic Insights
5. Nematollahi A, Fisher JM, **Furlong MA**, Beamer PI, Goodrich JM, Graber JM, Calafat AM, Botelho JC, Beitel SC, Littau SR, Gulotta JJ, Wallentine DD, Burgess JL, Comparison of Serum PFAS Concentrations in Incumbent and Recruit Firefighters and Longitudinal Assessment in Recruits. *In Revision,* Journal of Occupational and Environmental Medicine
6. Arellano AF, Yuan S, Knickrehm L, Chang HI, Castro CL**, Furlong MA**.Towards quantifying

atmospheric dispersion of pesticide spray drift in Yuma County Arizona. *In revision,* Atmospheric Environment.

MEDIA

Media featuring 2022 Neurology paper (Furlong et al) on Air Pollution, Physical Activity, and Brain Structure

- NYTimes Feature: Exercise Can Build Up Your Brain. Air Pollution may Negate Those Benefits, featuring my 2022 papers on air pollution and the brain: https://www.nytimes.com/2022/02/23/well/move/exercise-air-pollution-dementia.html
- Science Daily Does Air Pollution Reduce the Benefits of Physical Activity on the brain? https://www.sciencedaily.com/releases/2021/12/211208161118.htm
- Azfamily.com https://www.azfamily.com/news/health/new-uarizona-study-shows-air-pollution-associated-with-dementia-risk/article_84687b70-5890-11ec-8475-23293bee1e8c.html?block_id=997197
- https://www.tekcrispy.com/2021/12/14/ejercicio-contaminacion-del-aire/Smog Could Reduce Exercise's Benefit to Your Brain https://www.usnews.com/news/health-news/articles/2021-12-09/smog-could-reduce-exercises-benefit-to-your-brain
- https://www.freepressjournal.in/health/study-finds-air-pollution-might-reduce-benefits-of-physical-activity-on-brain Study finds air pollution might reduce benefits of physical activity on brain
- https://www.earth.com/news/brain-benefits-of-exercise-are-compromised-by-air-pollution/
- https://d1softballnews.com/running-and-playing-sports-in-polluted-areas-reduces-the-benefits-of-physical-exercise-the-positive-effects-on-the-brain-disappear-i-study-2/
- United Press international (UPI) Smog May Reduce exercise's benefits for the brain https://www.upi.com/Science_News/2021/12/10/smog-may-cancel-out-exercise-benefits/3231639084313/

Expert Interviews

- University of Arizona Health Sciences Expert Insights Series: What Is Pesticide Poisoning? June 2021
- TV Interview: Tucson KGUN9 on your side UA Researchers Study Link Between Prenatal Exposure to Pesticides and ADHD. https://www.kgun9.com/news/local-news/ua-researchers-study-link-between-prenatal-exposure-to-pesticides-and-adhd April 30 2019

Media featuring grant proposal and pesticides and ADHD

- Additude mag: Does Prenatal Exposure to Pesticides Increase a Child's Risk for ADHD? A team of researchers from the University of Arizona will aim to answer this question by conducting one of the first studies investigating whether a link exists between prenatal exposure to two types of widely used pesticides and ADHD diagnoses in children. https://www.additudemag.com/does-pesticide-exposure-increase-adhd-risk/ May 1, 2019
- Article: Eurekalert UA to study link between prenatal exposure to pesticides and childhood ADHD https://www.eurekalert.org/pub_releases/2019-04/uoah-uts042919.php
- Article: Inside Tucson Business.com Tech Talk: The speed of sound, pesticides, CEOs and more https://www.insidetucsonbusiness.com/news/tech-talk-the-speed-of-sound-pesticides-ceos-and-more/article_11679cfa-7d8c-11e9-aca8-fb544efaaeb5.html

- Article: Arizona: Study Link between Prenatal Exposure to Pesticides and Childhood ADHD https://www.aspph.org/arizona-assistant-professor-to-study-link-between-prenatal-exposure-to-pesticides-and-childhood-adhd/

Media on Antibiotics and Weight Change

- Article: Arizona: Antibiotics and Weight Change in Women https://www.aspph.org/arizona-antibiotics-and-weight-change-in-women/

CONFERENCES/SCHOLARLY PRESENTATIONS

ORAL PRESENTATIONS

INVITED

Furlong M. "Pre-conception and Prenatal Exposure to Agricultural Pesticides and Childhood ADHD: Linking High Dimensional Pesticide Use Records, Birth Certificates, and Medicaid Data in the State of Arizona" Wayne State University P30 Center for Urban Responses to Environmental Stressors, May 2023

Furlong M. "Integrating Big Data for Pesticide Epidemiology." Health and Environmental Change: Pushing Research Boundaries Through Arizona-France Cooperation. University of Arizona, November 2022

Furlong M & Burgess J (joint co-presenters) "The Firefighter Cancer Cohort Study (FFCCS): MicroRNA studies". Southwester Environmental Health Science Center (SWEHSC NIEHS P30) Research Discussions, University of Arizona, October 2022.

Burgess J & **Furlong M** (joint co-presenters) "Evaluation of Firefighter Exposures and Cancer Risks." University of Arizona Cancer Center Annual Retreat, October 2022

Furlong M. "Interactions of Physical Activity and Air Pollution on Brain Structure". GoodForm Informant Working Group, New York City. June 2022

Furlong M, Juarez C. "Science Café: Health Effects of Pesticides on Populations". SWEHSC Community Engagement Presentations. University of Arizona March 2022

Furlong M. "Rethinking Health Outcomes Exploration in Pesticide Epidemiology: Roles for -OMICs and Statewide Exposure and Health Databases". NIEHS Early Stage Investigator Webinar, March 2022

Furlong M, Burgess J. "Use of urine metabolomics to evaluate firefighter exposures and implications for toxicity and carcinogenicity". University of Arizona Cancer Center Grand Rounds, March 2022.

Furlong M. "Pesticides and Neurological Outcomes." University of California at Los Angeles Seminar Epidemiology, April 2021.

Furlong M. "Pesticides, Parkinson's Disease, and Personal Protective Equipment." Presentation at National Institutes of Environmental Health Sciences, July 2013

Furlong M. "Clean stoves, Firewood User Groups, and Firewood Collection." Presentation for RTI's International Development Group. March 2010.

SUBMITTED

Furlong M. "Prenatal and Pre-Conception Exposure to Pesticides and Associations with Childhood ADHD". International Society of Exposure Science, Chicago, Illinois, August 2023

Furlong M. "PFAS and Differential miRNA Expression in Firefighters". International Society of Exposure Science, Chicago, Illinois, August 2023

Furlong M, Arellano A. "Drift from Agricultural Pesticide Applications During Pre-conception and Pregnancy and Associations with Extremely Preterm Birth in Arizona." American Meteorological Society, Denver, Colorado, January 2023

Furlong M. "Big Data Approaches to Evaluate Pesticide Toxicities in Humans." UArizona Health Sciences One Health Symposia. May 2022.

Furlong M. "Linking Pesticide Use Records and Birth Certificates in Arizona." Symposia at International Society of Environmental Epidemiology, Virtual, September 2021.

Furlong M. "Early Life Pyrethroid Pesticide Exposures and Childhood Neurodevelopment." University of California at Los Angeles Epidemiology Graduate Seminar. February 2020.

Furlong M, Raichlen D, Klimentidis Y, Alexander G. "Interactions Between Physical Activity and Air Pollution on Brain Structure in the UK Biobank." University of Arizona Pharmacology Data Blitz, May 2019.

Furlong M, Braun JM, Froehlich T, Lanphear B, Richardson J, Yolton K. "Pyrethroid Metabolites During Pregnancy and Longitudinal Child Behavior in the Cincinnati HOME Study." Joint Meeting for the International Society for Exposure Science and the International Society of Environmental Epidemiology, Ottawa CA, August 2018.

Beamer P, **Furlong M**, Guerra S, Lothrop N, O'Rourke MK, Stern D, Zhai J, Billheimer D, Halonen M, Wright A, Martinez FD. "CC16 levels into adult life are associated with nitrogen dioxide exposure at birth." Joint Meeting for the International Society for Exposure Science and the International Society of Environmental Epidemiology, Ottawa CA, August 2018.

Furlong M, Beamer P. "Improving Spatial Resolution of Pesticide Applications in Arizona's Pesticide Use Reporting System." International Society for Exposure Science, Durham North Carolina, October 2017.

Lothrop N, Bell M, Brown H, **Furlong M**, Guerra S, O'Rourke MK, Beamer P. Modeling Air Pollution Concentrations with Land Use Regression in Tucson, AZ. International Society for Exposure Science, Durham NC 2017.

Furlong M, Sandler D, Halverson-Deming S. "Antibiotics and Weight Gain in the Sister Study." International Society for Environmental Epidemiology, Seattle, Washington, August 2014

POSTER PRESENTATIONS

Furlong M, Paul KC, Parra K, Beamer P, Ritz B. Pesticides During Pre-Conception and Pregnancy, and

Associations with Extremely Preterm Birth: A Pesticide-Wide Association Study. International Society of Environmental Epidemiology, Athens, Greece. September 2022.

Furlong MA, Paul KC, Yan Qi, Chuang YH, Cockburn MG, Bronstein JM, Horvath S, Ritz B. "An Epigenome-Wide Association Study of Ambient Pyrethroid Pesticide Exposures in California's Central Valley". International Society of Environmental Epidemiology, Washington, DC (Moved to Virtual), August 2020.

Furlong M, Harber P, Morgan W, Wright A, Stern D, Guerra S, Martinez F. "Early Life Respiratory Status And Adult Occupational Exposures: Prospective Evidence For Healthy Worker Bias." International Society of Environmental Epidemiology, Utrecht Netherlands, August 2019.

Furlong M, Alexander GE, Klimentidis Y, Raichlen D. "Physical Activity May Modify the Association Between Air Pollution and Brain Structure in the UK Biobank." Joint Meeting for the International Society for Exposure Science and the International Society of Environmental Epidemiology, Ottawa CA, August 2018.

Teeters B, Beamer P, **Furlong M.** "Pesticide Exposure Rates by Residential and Agricultural Housing Status in 2012 in Yuma County." Undergraduate Research Opportunities Consortium Forum, August 2017

Barboza J, Beamer P, **Furlong M**. "Pesticide Exposure Rates in Pinal County from 2012-2016. Undergraduate Research Opportunities Consortium Forum, August 2017.

Furlong M, Engel S, Barr D, Wolf M. "Prenatal Pyrethroid Exposure and Childhood Behavior and Executive Functioning." Society for Epidemiological Research, Seattle Washington, June 2017.

Furlong M, Beamer P. "Prenatal exposure to pyrethroid and organophosphorus pesticides and birth outcomes in Arizona." Society for Epidemiological Research, Seattle Washington, June 2017.

Furlong M, Engel S, Buckley J, Daniels J, Engel L, Goldman B, Wolff M, Herring A. "Prenatal Exposure to Organophosphorus Pesticides and Childhood Neurodevelopmental Phenotypes." Society for Epidemiological Research, Miami Florida, June 2016.

Furlong M, Tanner C, Goldman S, Bhudhikanok G, Blair A, Chade A, Korell M, Hoppin J, Kasten M, Langston J, Marras C, Meng C, Richards, M., Ross, G., Umbach, D., Sandler, D., Kamel, F. "Protective Glove Use and Hygiene Habits Modify the Associations of Specific Pesticides with Parkinson's Disease." International Society for Environmental Epidemiology, Seattle Washington, August 2014.

Furlong M., Engel S., Barr D., Wolff, M. "Organophosphate pesticides and social responsiveness in childhood." Poster presented at Society for Epidemiological Research, June 2013, Boston MA.

AWARDED GRANTS AND CONTRACTS

ACTIVE

09/01/2018-08/31/2024 NIH (NIEHS) K99/R00ES028743 **(PI: Furlong)**
Prenatal Exposure to Pesticide Mixtures and Childhood ADHD. The overall goals of this proposal are to build an atmospheric dispersion model of pesticide applications in the state of Arizona, identify ADHD cases in Medicaid claims data using a validated algorithm, and estimate the associations between

prenatal exposure to mixtures of pesticides and childhood ADHD using Bayesian Kernel Machine Regression.
Role: Principal Investigator (75% effort years 1-4, 42% effort year 5)
Total costs: $909,562
Indirect costs: $272,397
Direct costs: $637,165
Personnel (R00): Melissa Furlong (PI), Edward Bedrick (co-I), Avelino Arellano (co-I), Alfred Fournier (co-I)
Personnel (K99): Melissa Furlong (PI), Paloma Beamer (mentor), Beate Ritz (mentor)

01/01/2023-12/31/2025 Arizona Board of Regents (ABOR) PIs: Burgess & **Furlong**
Interventions to Reduce Firefighter Cancer and Cardiovascular Risks. This proposal seeks to evaluate whether plasmapheresis is an effective intervention to reduce PFAS levels in firefighters, and to evaluate the impact of plasmapheresis and other interventions on biomarkers of longevity (epigenetic age, metabolic age, cardiovascular risk factors).
Role: Co Principal Investigator (20% Effort)
Total costs: $3,896,726
Indirect costs: none
Direct costs: $3,896,726
Personnel: Jefferey Burgess (co-PI), Melissa Furlong (co-PI), Karen Lutrick (co-I), Floris Wardenaar (ASU, co-I)

07/2022-06/2025 Federal Emergency Management Agency (FEMA) (PI: Burgess)
Women Fire Fighters Study: Evaluation of Exposures and Toxicity To evaluate exposures associated with adverse reproductive outcomes and increased bladder cancer in women firefighters, and plan effective interventions to mitigate these conditions.
Role: Co-Investigator (10% Effort)
Total costs $1,500,000
Indirect costs: $468,429
Direct costs: $1,031,571
Key Personnel: Jefferey Burgess (PI), Melissa Furlong (co-I), Leslie Farland (co-I), Yiwen Liu (co-I), Malak Tfaily (co-I)

04/2023-03/2028 NIH (NIEHS) P30ES006694-26 (PI: Cherrington)
Southwest Environmental Health Sciences Center The mission of the SWEHSC is to facilitate the application of the NIEHS Strategic Plan in the unique environment of the desert southwest, to the unique populations who live there. The SWEHSC has been a driving force behind the advancement of environmental research related to arid environments through the organization of three main research themes: 1) Environmental Exposures in Underserved Southwest Populations, 2) Environmental Lung Disease, and 3) Adaptive Responses to Environmental Stresses
Role: Co-Director of Research Focus Group 1 and co-Investigator (3% effort)
Total Costs: $7,675,000
Indirect costs: $2,675,000
Direct costs: 5,000,000
Key Personnel: Nathan Cherrington (PI), Paloma Beamer (co-I), Dean Billheimer (co-I) Jefferey Burgess (co-I), Melissa Furlong (co-I), Jon Chorover (co-I), Zelieann Craig (co-I), Douglas Cromey (co-I), Xinxin

Ding (co-I), Jim Galligan (co-I), Julie Ledford (co-I), Ben Richmond (co-I), George Watts (co-I), Georg Wondrak (co-I), Stephen Wright (co-I)

COMPLETED

07/01/2021-03/30/2023 **P30 Pilot (Southwest Environmental Health Sciences Center) (PI: Furlong) An Outcome-Wide Environmental Epidemiology Approach To Synthesize Big Data.** The goal of this project is to use targeted and untargeted metabolomic approaches to identify a wide variety of chronic health effects of pesticide exposures during pregnancy
Role: Principal Investigator, 0% effort
Total Costs: $50,000
Indirect costs: None
Direct costs: $50,000
Personnel: Melissa Furlong (PI)

01/01/2019-12/31/2022 **CDC NU53DD00162-03-01** (PI: Pettygrove)
Arizona Developmental Disabilities Surveillance Program (ADDSP). The overall goals of this contract are to estimate the rate of autism and developmental disabilities in Arizona.
Role: Co-I (5% effort)
Total costs: $3,100,000
Indirect costs: $623,342
Direct costs: $2,476,658
Personnel: Sydney Pettygrove (PI), Jennifer Andrews (co-I), Melissa Furlong (co-I), Sydney Rice (co-I), Gondy Leroy (co-I), Margaret Kurzius-Spencer (co-I)

02/01/2021-01/31/2022 **P30 Pilot (UArizona Cancer Center) (PI: Furlong** & Burgess**)**
Metabolomic Approaches to Assess Cancer Signatures in Firefighters. The goal of this project is to use targeted and untargeted metabolomic approaches to identify the firefighter-related exposome post-fire, as well as the endogenous metabolomic response to fires.
Role: Principal Investigator, 0% effort
Total costs: $50,000
Indirect costs: none
Direct costs: $50,000
Personnel: Jefferey Burgess (co-PI), Melissa Furlong (co-PI)

10/01/2016-08/31/2017 CDC-NIOSH WCAHS Pilot **2U54OH007550** (**MPI**: **Furlong** & Beamer)
Arizona's Pesticide Use Registry and Vital Statistics Birth Certificates. The overall goal of this project is to explore associations between living near pesticide applications during pregnancy and birth outcomes in Arizona, and possible modification by farmworker occupational status.
Role: Co-Principal Investigator, 0% effort
Total costs: $26,000
Indirect costs: $9,062
Direct costs: $16,938
Personnel: Melissa Furlong (co-PI), Paloma Beamer (co-PI)

SUBMITTED GRANTS AND CONTRACTS

PENDING

04/01/2024-03/31/2029 NIH **R01ES034728** (**PI: Furlong**)
High Throughput Phenome-Wide Applications for Epidemiology of Pesticides and Children's Health.
The overall goals of this proposal are to perform a phenome-wide association study of pre-conception and prenatal exposures to pesticides with childhood health in Arizona.
Role: Principal Investigator (30% Effort)
Total Costs: $3,708,784
Indirect costs: $1,247,278
Direct costs: $2,461,506
Personnel: Melissa Furlong (PI), Alfred Fournier (co-I), Edward Bedrick (co-I), Jennifer Andrews (co-I)

*09/2023-08/2028 NIH R01ES035965-01 (PI Burgess)
Title: **Wildland-Urban Interface Fire Exposures, Effects, and Interventions: A Collaborative Research-to-Action Partnership with Firefighters**
Major goals: The goals of this R01 are to evaluate fireground exposures during WUI responses in relation to fireground characteristics, measure toxic effects of WUI exposures, and evaluate interventions to reduce WUI exposures.
Role: Co-Investigator (10% Effort)
* Scored in top 5%
Total Costs: $3,827,145
Indirect Costs: $1,001,695
Direct Costs: $2,825,450
Personnel: Jefferey Burgess (PI), Melissa Furlong (co-I), Jackie Goodrich (co-I), Yiwen Liu (co-I)

09/01/2023-08/30/2026 NIH P20 (mPI Ernst, Hoover, Arora)
Southwest Center on Resilience for Climate Change and Health (SCORCH)
This is a center planning grant to increase climate change health research capacity at the University of Arizona. Project 2's goals are to examine associations of heatwaves during pregnancy with neurodevelopment.
Role: Project 2 Lead (25% Effort)
Total Costs: $3,827,073
Indirect Costs: $1,206,614
Direct Costs: $2,620,459
Personnel: Kacey Ernst (mPI & contact PI), Mona Arora (mPI & CEC director), Joseph Hoover (mPI and IDVC core director), Paloma Beamer (co-I), Melissa Furlong (co-I, Project 2 Lead), Ladd Keith (co-I), Shujuan Li (co-I, Project 1 Lead), Chris Lim (co-I), Yiwen Liu (co-I), Cristian Palacio (co-I), Mackenzie Waller (co-I)

04/01/2024 Health Effects Institute (PI: Lim)
Relationships Between Electric Vehicle Adoption, Air Pollution, and Low Birthweight in Tucson, Arizona The overall goals of this proposal are evaluate relationships between air pollution and low birthweight, and the potential for electric vehicles to moderate this relationship.
Role: co-Investigator (10% Effort)
Total Costs: $1,080,818

Indirect costs: $$244,460
Direct costs: $838,358
Personnel: Chris Lim (PI), Paloma Beamer (co-I), Melissa Furlong (co-I), Henrick Haule (co-I), Yao-jan Wu (co-I)

09/01/2023-08/30/2025 NIH **R21** (**mPI: Furlong** and Andrews)
Autoimmune Disease and Exposome
The overall goals of this proposal are to link elements of the exposome with All of Us and Medicaid data in order to study the exposome and associations with autoimmune disease
Role: multiple Principal Investigator (33% Effort)
Total Costs: $407,973
Indirect Costs: $132,973
Direct Costs: $275,000
Personnel: Jennifer Andrews (mPI and contact PI), Melissa Furlong (mPI), Sarah Mathena (co-I)

NOT AWARDED

12/2022 – 11/2027 NIH **R01ES034730** (MPI: Burgess and Goodrich)
Title: **Identification of toxic effects of PFAS exposure: A multi-omic study of firefighters**
Major Goals: These data will be used to: 1) evaluate the associations between baseline PFAS and repeat measures of epigenetic age and locus-specific DNA methylation; 2) identify functional omics biomarkers of toxicity at baseline (miRNA) and follow-up (miRNA, proteins) that are associated with repeat measures of PFAS concentrations; and 3) develop an omics signature of PFAS exposure and toxicity by integrating data across omics platforms. We hypothesize that higher serum concentrations of PFAS will be associated with accelerated epigenetic aging and DNA methylation, miRNA, and protein differences in genes/proteins implicated in the aging process, carcinogenesis, and immunotoxicity. The omics signatures of toxicity identified in this study can be used to inform risk assessment and development of intervention strategies to protect against PFAS toxicity.
Role: Co-Investigator (10% Effort)
Total costs $3,792,325
Indirect costs: $898, 559
Direct costs: $2,893,766
Personnel: Jefferey Burgess (mPI), Jackie Goodrich (mPI), Melissa Furlong (co-I)

9/01/2022-08/31/2027 NIH **R01** (**PI: Furlong**)
High Throughput Phenome-Wide Applications for Epidemiology of Pesticides and Children's Health.
The overall goals of this proposal are to perform a phenome-wide association study of pre-conception and prenatal exposures to pesticides with childhood health in Arizona.
Role: Principal Investigator (30% Effort)
Total Costs: $3,729,763
Indirect costs: $1,238,349
Direct costs: $2,491,414
Personnel: Melissa Furlong (PI), Alfred Fournier (co-I), Dean Billheimer (co-I), Avelino Arellano (co-I)

OTHER FUNDING
2018 Dean's Annual Fund: Conference Travel Funding
2014 Parkinson's Disease Foundation: Student Travel Grant

2013 University of North Carolina Department of Epidemiology: Student Travel Grant

TEACHING

Primary Instructor, University of Arizona EHS 610 Lifecourse Epidemiology of Environmental Exposures, Fall 2023
Primary Instructor, University of Arizona EHS 220 Deadly Hype: Finding Truth in the age of Health (Mis)Information, Spring 2023
Primary Instructor, University of Arizona EHS 696, Environmental and Occupational Health Seminar, Fall 2020, Spring 2021
Guest Lecture, University of Arizona CPH 375, Introduction to Environmental and Occupational Health, Spring 2019, Spring 2021, Spring 2022, Spring 2023
Co-Instructor, University of Arizona CPH 426/526, Topics in Environmental Justice, Fall 2018
Guest Lecture, University of Arizona CPH 609, Evaluating Public Health Literature, Fall 2018, Fall 2019, Fall 2020, Fall 2021, Fall 2022
Guest Lecture, University of Arizona Student Seminar for Epidemiology (Spring 2017)
Guest Lecture, University of Arizona Student Seminar for Community, Environment and Policy (Fall 2016, Spring 2018)
Teaching Assistant, UNC Principles of Epidemiology for Public Health, Victor Schoenbach (Summer 2015)
Teaching Assistant, UNC Introduction to Logic and Probability, Charles Poole (Fall 2014)
Teaching Assistant, Duke University Intermediate Microeconomics, Subhrendu Pattanayak (Spring 2010)
Teaching Assistant, Duke University Globalization and Governance, Bruce Jentleson (Fall 2009, Fall 2010)
Teaching Assistant, Duke University Microeconomics and Public Policy, Elizabeth Ananat (Spring 2009)

MENTORSHIP

2021- present	**University of Arizona Environmental Health Sciences PhD Committee Chair** Mentee: Tuo Liu (PhD in Environmental Health Sciences)
2021 - Present	**University of Arizona Environmental Health Sciences PhD Committee Chair** Mentee: Rietta Wagoner (PhD in Environmental Health Sciences)
2022 - Present	**University of Arizona Environmental Health Sciences PhD Committee Member** Mentee: Jenna Honan (PhD in Environmental Health Sciences)
2019- 2023	**University of Arizona Epidemiology PhD Dissertation Committee Member** Mentee: Kim Parra (PhD in Epidemiology)
2021-2023	**University of Arizona Environmental Health Sciences PhD Committee Member** Mentee: Amy Nematollahi PhD
2022	**University of Arizona Undergraduate Research Opportunities Consortium (UROC)** Melody Weber (Undergraduate)
2020	**University of Arizona Environmental Health Sciences MS** Mentee: Celia Ritter (MPH in Environmental Health Sciences)
2018	**University of Arizona Undergraduate Internship**

Mentee: Jay Pacheco-Chino (Undergraduate)

2017 **University of Arizona Undergraduate Research Opportunities Consortium** Mentored Research Mentee: Breanna Teeters (Undergraduate)

2017 **University of Arizona FRONTERA Summer Internship** Research Project
Mentee: Josue Barboza (Undergraduate)

2017 **University of Arizona, Fall Independent Study**
Mentee: Tun Nef (Undergraduate)

PROFESSIONAL SOCIETIES

Society for Epidemiological Research
International Society for Environmental Epidemiology
International Society for Exposure Science