

Julia E. Rager, Ph.D.

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Office/Laboratory: 349 Rosenau Hall / 1204 Michael Hooker Research CenterMailing: 135 Dauer Drive, Campus Box #7431, Chapel Hill NC, 27599Rager lab website: <https://tarheels.live/ragerlab/>**Education**

Post-Doctoral Associate	<i>U.S. Environmental Protection Agency, ORISE Fellow</i> National Exposure Research Laboratory Exposure Forecasting (ExpoCast) Team	2014-2015
Ph.D.	<i>University of North Carolina (UNC) at Chapel Hill</i> Degree: Environmental Sciences and Engineering Focus in Toxicology Mentor: Rebecca Fry	2013
M.S.E.E.	<i>University of North Carolina (UNC) at Chapel Hill</i> Degree: Environmental Sciences and Engineering Focus in Toxicology and Environmental Engineering Mentor: Rebecca Fry	2010
B.S.	<i>University of Texas (UT) at Austin</i> Degree: Civil and Environmental Engineering Pre-Medicine High Honors, Magna Cum Laude (GPA 3.79)	2008

Professional Experience

Assistant Professor, Tenure Track, Department of Environmental Sciences and Engineering, UNC	2021-present
Assistant Professor, Research Track, Institute for Environmental Health Solutions, UNC	2018-2020
Scientist III, Toxicology Consultant, ToxStrategies	2015-2018
Post-Doctoral Associate, U.S. EPA	2014-2015
Post-Doctoral Associate, UNC	2013-2014
Graduate Research Assistant, UNC	2009-2013
Undergraduate Research Assistant, UT	2007-2008

Other Professional Experience

Assistant Professor and Affiliate, Center for Environmental Medicine, Asthma and Lung Biology, UNC	2021-present
Assistant Professor and Affiliate, Curriculum in Toxicology and Environmental Medicine, UNC	2020-present
Assistant Professor and Affiliate, Institute for Environmental Health Solutions, UNC	2018-present

Honors and Awards

- Outstanding New Environmental Scientist (ONES) Award, NIH 2024
Career award for highest creativity, promise, and productivity in environmental exposure and human health research

- Gillings Research Excellence Award, UNC 2023
Demonstrated excellence, innovation, and impact in public health research for early to mid-career professors
- Extramural Paper of the Month Award (August), NIEHS 2023
'A multi-omic approach identifies an autism spectrum disorder (ASD) regulatory complex of functional epimutations in placentas from children born preterm' by Freedman et al. PMID: 36938998
- Extramural Paper of the Month Award (February), NIEHS 2023
'Wildfire Variable Toxicity: Identifying Biomass Smoke Exposure Groupings through Transcriptomic Similarity Scoring' by Koval et al. (Rager senior author) PMID: 36399130
- Extramural Paper of the Month Award (October), NIEHS 2022
'Wildfires and extracellular vesicles: Exosomal MicroRNAs as mediators of cross-tissue cardiopulmonary responses to biomass smoke' by Carberry et al. (Rager senior author) PMID: 35863239
- Extramural Paper of the Month Award (September), NIEHS 2022
'Environmental mixtures and breast cancer: identifying co-exposure patterns between understudied vs breast cancer-associated chemicals using chemical inventory informatics' by Koval et al. (Rager senior author) PMID: 35710593
- Teaching Innovation Award, UNC Gillings School of Global Public Health 2021-2022
- Scientific and Technological Achievement Award, US EPA 2020
- Best Paper for Advancing Chemical Regulatory and Safety Evaluation, Society of Toxicology 2019
'A Framework for Systematic Evaluation and Quantitative Integration of Mechanistic Data in Assessments of Potential Human Carcinogens' by Wikoff et al. PMID: 30423162
- Best Paper for Advancing the Science of Risk Assessment, Society of Toxicology 2018
'Benchmark Dose Modeling Estimates of the Concentrations of Inorganic Arsenic That Induce Changes to the Neonatal Transcriptome, Proteome, and Epigenome in a Pregnancy Cohort' by Rager et al. 2017
- Risk Assessment Specialty Section Top 10 Abstracts, Society of Toxicology 2016, 2017
- Junior Investigator Award, Lung Cellular and Molecular Physiology 2014
American Journal of Physiology
- Syngenta Fellowship in Human Health Applications of New Technologies 2013
Society of Toxicology
- Best Regional Chapter Poster Award, NC Society of Toxicology 2013
- Graduate Student Fellowship – Novartis Award, Society of Toxicology 2012
- Outstanding Scholarship and Professional Promise in Environmental Engineering 2011
George C. Bunker Award, UNC
- Best Student Presentation, Society of Toxicology Mixtures Specialty Section 2011
- Magna Cum Laude and High Honors in Engineering, University of Texas 2008

Scientific Membership

- International Society of Exposure Science (ISES) 2021-present
- ExpoCast Communities of Practice at the US Environmental Protection Agency (US EPA) 2020-present
- Health and Environmental Sciences Institute (HESI) Bioinformatics for Botanicals Safety 2020-present
- Health and Environmental Sciences Institute (HESI) eSTAR POD Transcriptomics Group 2020-present
- Health and Environmental Sciences Institute (HESI) Bioinformatics for eSTAR Carcinogenomics 2020-2023
- The Toxicology Forum (ToxForum) 2017-2020
- Environmental Mutagenesis and Genomics Society (EMGS) 2016-present
- North Carolina Society of Toxicology (NC SOT) 2011-present

Rager Lab Trainees' Honors and Awards

- Hickman, Elise (Current Postdoctoral Fellow). Society of Toxicology's Exposure Specialty Section (ESS) Post-doctoral Travel Abstract Award. Mar 2024.
- Hickman, Elise (Current Postdoctoral Fellow). Society of Toxicology's Mixtures Specialty Section (MixSS) Best Student/Postdoc Abstract Award. Mar 2024.
- Koval, L (Current PhD Candidate). SOT Computational Toxicology Specialty Section (CTSS) Yves Alarie Diversity Award. Mar 2024.
- Koval, L (Current PhD Candidate). SOT Computational Toxicology Specialty Section (CTSS) Best Abstract Award. Mar 2024.
- Carberry, C (Current PhD Candidate). UNC Travel Funds from the Graduate School Student Transportation Grant and the Graduate & Professional Student Government Travel Awards to fund attendance at the Society of Toxicology (SOT) Annual Meeting. Mar 2024.
- Hickman, Elise (Current Postdoctoral Fellow). North Carolina Society of Toxicology's 1st Place President Award for Research Competition (PARC). Sept 2023.
- Koval, L (Current PhD Candidate). International Society of Exposure Science's IPA/DGUV Young Exposure Scientist Award. Aug 2023.
- Carberry, C (Current PhD Candidate). Society of Toxicology Mixtures Specialty Section's 3rd Place Best Overall Abstract in Mixtures Award. Mar 2023.
- Koval, Lauren (Current PhD Candidate). Curriculum in Toxicology and Environmental Medicine's Holbrook Travel Award Honorable Mention. Mar 2023.
- Hickman, Elise (Current Postdoctoral Fellow). Society of Toxicology's Biological Modeling Specialty Section Andersen-Clewell Trainee Award. Mar 2023.
- Carberry, Celeste (Current PhD Candidate). Society of Toxicology's Graduate Student Travel Award. Nashville, TN. Mar 2023.
- Carberry, Celeste (Current PhD Candidate). North Carolina Society of Toxicology's Graduate Student Presentation Award (3rd Place). Durham, NC. Oct 2022.
- Keshava, Deepak (Former Undergraduate Research Assistant). International Conference on Environmental Mutagens' Student Travel Award. Ottawa, Canada. Aug 2022.
- Payton, Alexis D (Former BSPH and MS Student, Current Data Analyst). The Department of Environmental Sciences and Engineering's Environmental Sciences Achievement Award. Chapel Hill, NC. Apr 2022.
- Koval, Lauren (Current PhD Candidate). UNC Gillings School of Global Public Health's Environmental Health Solutions Student Travel Award. Apr 2022.
- Keshava, Deepak (Former Undergraduate Research Assistant). Environmental Mutagenesis and Genomics Society Student Travel Award. Ottawa, CA. Aug 2022.
- Carberry, Celeste C (Current PhD Candidate). Society of Toxicology's Mixtures Specialty Section Graduate Student Award. San Diego, CA. Mar 2022.
- Carberry, Celeste C (Current PhD Candidate). UNC Curriculum in Toxicology & Environmental Medicine Leon Golberg Memorial Travel Award. Mar 2022.
- Keshava, Deepak (Former Undergraduate Research Assistant). North Carolina Society of Toxicology Poster Award. Research Triangle Park, NC (virtual). Jan 2022.
- Carberry, Celeste C (Current PhD Candidate). Pfizer Society of Toxicology Undergraduate Student Travel Award. San Diego, CA (virtual). Mar 2020.
- Payton, Alexis D (Former BSPH and MS Student, Current Data Analyst). Public Health Graduate Student Scholarship. Chapel Hill, NC. 2020-2021 Academic Year.

Bibliography

Peer-Reviewed Publications (90 Published or In Press; h-index = 33, citations > 3600)

⁺⁺Senior Authorship; *Trainee within the Rager laboratory; #Data analyst within the Rager laboratory

1. Winker R*, Payton A#, Brown E, McDermott E*, Freedman JH, Lenhardt C, Eaves LE, Fry RC, **Rager JE**⁺⁺. Wildfires and Climate Justice: Future Wildfire Events Predicted to Disproportionally Impact Socioeconomically Vulnerable Communities in North Carolina. *Frontiers in Public Health*. 2024. *Accepted, in press*.
2. Ghosh A, Payton A#, Gallant SC, Rogers KL Jr, Mascenik T, Hickman E, Love CA, Schichlein KD, Smyth TR, Kim YH, **Rager JE**, Gilmour MI, Randell SH, Jaspers I. Burn Pit Smoke Condensate-Mediated Toxicity in Human Airway Epithelial Cells. *Chem Res Toxicol*. 2024 Apr 23. doi: 10.1021/acs.chemrestox.4c00064. Epub ahead of print. PMID: 38652897.
3. Smyth T, Payton A#, Hickman E*, **Rager JE**, Jaspers I. Leveraging a Comprehensive Unbiased RNAseq Database Uncovers New Human Monocyte-Derived Macrophage Subtypes Within Commonly Employed In Vitro Polarization Methods. *bioRxiv [Preprint]*. 2024 Apr 8:2024.04.04.588150. doi: 10.1101/2024.04.04.588150. PMID: 38645108; PMCID: PMC11030221.
4. Hickman E*, Alexis NE, **Rager JE**, Jaspers I. Airway Proteotypes of E-Cigarette Users Overlap with Those Found in Asthmatics. *American Journal of Respiratory Cell and Molecular Biology*. 2024 Apr;70(4):326-328. doi: 10.1165/rcmb.2023-0381LE. PMID: 38557396.
5. Vitucci E, Carberry CK*, Payton A#, Herring LE, Mordant AL, McCullough SD, **Rager JE**⁺⁺. Characterizing the Extracellular Vesicle Proteomic Landscape of the Human Airway Using In Vitro Organotypic Multi-Cellular Models. *Cell - iScience*. 2023 Oct 10;26(11):108162. doi: 10.1016/j.isci.2023.108162. PMID: 37920665. PMCID: PMC10618692.
6. Carberry CK*, Bangma J, Koval L*, Keshava D, Hartwell HJ, Sokolsky M, Fry RC, **Rager JE**⁺⁺. Extracellular Vesicles altered by a Per- and Polyfluoroalkyl Substance Mixture: In Vitro Dose-Dependent Release, Chemical Content, and MicroRNA Signatures involved in Liver Health. *Toxicol Sci*. 2023 Oct 18;197(2):155-169. doi: 10.1093/toxsci/kfad108. Epub ahead of print. PMID: 37851381.
7. Eaves LA, Keil AP, Jukic AM, Dhingra R, Brooks JL, Manuck TA, **Rager JE**, Fry RC. Toxic metal mixtures in private well water and increased risk for preterm birth in North Carolina. *Environ Health*. 2023 Oct 16;22(1):69. doi: 10.1186/s12940-023-01021-7. PMID: 37845729. PMCID: PMC10577978.
8. **Rager JE**, Rider CV. Wrangling Whole Mixtures Risk Assessment: Recent Advances in Determining Sufficient Similarity. *Curr Opin Toxicol*. 2023 Sep;35:100417. doi: 10.1016/j.cotox.2023.100417. PMID: 37790747; PMCID: PMC10545370.
9. Payton A#, Roell KR, Rebuli ME, Valdar W, Jaspers I, **Rager JE**⁺⁺. Navigating the bridge between wet and dry lab toxicology research to address current challenges with high-dimensional data. *Front Toxicol*. 2023 May 26:5:1171175. doi: 10.3389/ftox.2023.1171175. PMID: 37304253; PMCID: PMC10250703.
10. Perryman A, Hye-Young H, Payton A#, **Rager JE**, McNell EE, Rebuli ME, Wells H, Almond M, Antinori J, Alexis NE, Porter NA, Jaspers I. Plasma sterols and vitamin D are correlates and predictors of ozone-induced inflammation in the lung: A pilot study. *PLoS One*. 2023 May 15;18(5):e0285721. doi: 10.1371/journal.pone.0285721. PMID: 37186612. PMCID: PMC10184915.
11. Freedman AN, Clark J, Eaves LA, Roell K, Oran A, Koval L*, **Rager J**, Santos HP Jr, Kuban K, Joseph RM, Frazier J, Marsit CJ, Burt AA, O'Shea TM, Fry RC. A multi-omic approach identifies an autism spectrum disorder (ASD) regulatory complex of functional epimutations in placentas from children born preterm. *Autism Res*. 2023 May;16(5):918-934. doi: 10.1002/aur.2915. Epub 2023 Mar 20. PMID: 36938998; PMCID: PMC10192070.
12. Jin B, Dunson DB, **Rager JE**, Reif DM, Engel SM, Herring AH. Bayesian Matrix Completion for Hypothesis Testing. *J R Stat Soc Ser C Appl Stat*. 2023 Mar 15;72(2):254-270. doi: 10.1093/jrssc/qlac005. PMID: 37197290; PMCID: PMC10184491.

13. Eaves LA, Lanier P, Enggasser AE, Chung G, Turla T*, **Rager JE**, Fry RC. Generation of the Chemical and Social Stressors Integration Technique (CASS-IT) to identify areas of holistic public health concern: An application to North Carolina. *Sci Total Environ*. 2023 Mar 1;862:160409. doi: 10.1016/j.scitotenv.2022.160409. PMID: 36436630. PMCID: PMC10695022.
14. Eaves LA, Bulka CM, **Rager JE**, Gardner AJ, Galusha AL, Parsons PJ, O'Shea TM, Fry RC. Metal mixtures modeling identifies birth weight-associated gene networks in the placentas of children born extremely preterm. *Chemosphere*. 2023 Feb;313:137469. doi: 10.1016/j.chemosphere.2022.137469. PMID: 36493891. PMCID: PMC10476282.
15. Carberry CK*, **Rager JE**⁺⁺. The Impact of Environmental Contaminants on Extracellular Vesicles and their Key Molecular Regulators: A Literature and Database-Driven Review. *Environ Mol Mutagen*. 2023 Jan;64(1):50-66. doi: 10.1002/em.22522. PMID: 36502378. PMCID: PMC10798145.
16. Kim YH, **Rager JE**, Jaspers I, Gilmour MI. Computational Approach to Link Chemicals in Anthropogenic Smoke Particulate Matter with Toxicity. *Chem Res Toxicol*. 2022 Dec 19;35(12):2210-2213. doi: 10.1021/acs.chemrestox.2c00270. PMID: 36373932.
17. Koval LE*, Carberry CK*, Kim YH, McDermott E*, Hartwell H, Jaspers I, Gilmour MI, **Rager JE**⁺⁺. Wildfire Variable Toxicity: Identifying Biomass Smoke Exposure Groupings through Transcriptomic Similarity Scoring. *Environ Sci Technol*. 2022 Dec 6;56(23):17131-17142. doi: 10.1021/acs.est.2c06043. PMID: 36399130. PMCID: PMC10777820.
18. Wambaugh JF, **Rager JE**⁺⁺. Exposure forecasting - ExpoCast - for data-poor chemicals in commerce and the environment. *J Expo Sci Environ Epidemiol*. 2022 Nov;32(6):783-793. doi: 10.1038/s41370-022-00492-z. PMID: 36347934. PMCID: PMC9742338.
19. Johnson KJ, Auerbach SS, Stevens T, Barton-Maclaren TS, Costa E, Currie RA, Dalmas Wilk D, Haq S, **Rager JE**, Reardon AJF, Wehmas L, Williams A, O'Brien J, Yauk C, LaRocca JL, Pettit S. A Transformative Vision for an Omics-Based Regulatory Chemical Testing Paradigm. *Toxicol Sci*. 2022 Nov 23;190(2):127-132. doi: 10.1093/toxsci/kfac097. PMID: 36165699. PMCID: PMC9702989.
20. Hickman E, Payton A[#], Duffney P, Wells H, Ceppe AS, Brocke S, Bailey A, Rebuli ME, Robinette C, Ring B, **Rager JE**, Alexis NE, Jaspers I. Biomarkers of Airway Immune Homeostasis Differ Significantly with Generation of E-Cigarettes. *Am J Respir Crit Care Med*. 2022 Nov 15;206(10):1248-1258. doi: 10.1164/rccm.202202-0373OC. PMID: 35731626. PMCID: PMC9746848.
21. Koval LE*, Dionisio KL, Friedman KP, Isaacs KK, **Rager JE**⁺⁺. Environmental mixtures and breast cancer: identifying co-exposure patterns between understudied vs breast cancer-associated chemicals using chemical inventory informatics. *J Expo Sci Environ Epidemiol*. 2022 Nov;32(6):794-807. doi: 10.1038/s41370-022-00451-8. PMID: 35710593. PMCID: PMC9742149.
22. Carberry CK*, Koval LE*, Payton A[#], Hartwell H, Ho Kim Y, Smith GJ, Reif DM, Jaspers I, Ian Gilmour M, **Rager JE**⁺⁺. Wildfires and extracellular vesicles: Exosomal microRNAs as mediators of cross-tissue cardiopulmonary responses to biomass smoke. *Environ Int*. 2022 Sep;167:107419. doi: 10.1016/j.envint.2022.107419. PMID: 35863239; PMCID: PMC9389917.
23. Carberry CK*, Keshava D*, Payton A[#], Smith GJ, **Rager JE**⁺⁺. Approaches to incorporate extracellular vesicles into exposure science, toxicology, and public health research. *J Expo Sci Environ Epidemiol*. 2022 Sep;32(5):647-659. doi: 10.1038/s41370-022-00417-w. PMID: 35217808; PMCID: PMC9402811.
24. Chao A, Grossman J, Carberry C*, Lai Y, Williams AJ, Minucci JM, Thomas Purucker S, Szilagyi J, Lu K, Boggess K, Fry RC, Sobus JR, **Rager JE**⁺⁺. Integrative exposomic, transcriptomic, epigenomic analyses of human placental samples links understudied chemicals to preeclampsia. *Environ Int*. 2022 Sep;167:107385. doi: 10.1016/j.envint.2022.107385. PMID: 35952468. PMCID: PMC9552572.
25. Carberry CK*, Ferguson SS, Beltran AS, Fry RC, **Rager JE**⁺⁺. Using liver models generated from human-induced pluripotent stem cells (iPSCs) for evaluating chemical-induced modifications and disease across liver developmental stages. *Toxicol In Vitro*. 2022 Sep;83:105412. doi: 10.1016/j.tiv.2022.105412. PMID: 35688329. PMCID: PMC9296547.

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27. Manuck TA, Eaves LA, **Rager JE**, Sheffield-Abdullah K, Fry RC. Nitric oxide-related gene and microRNA expression in peripheral blood in pregnancy vary by self-reported race. *Epigenetics*. 2022 Jun-Jul;17(7):731-745. doi: 10.1080/15592294.2021.1957576. PMID: 34308756; PMCID: PMC9336489.
28. Corton CJ, Mitchell CA, Auerbach S, Bushel JP, Ellinger-Ziegelbauer H, Escobar PA, Froetschl R, Harrill AH, Johnson K, Klaunig JE, Pandiri AR, Podtelezhnikov AA, **Rager JE**, Tanis KQ, van der Laan JW, Vespa A, Yauk CL, Pettit SD, Sistare FD. A Collaborative Initiative to Establish Genomic Biomarkers for Assessing Tumorigenic Potential to Reduce Reliance on Conventional Rodent Carcinogenicity Studies. *Toxicol Sci*. 2022 Jun 28;188(1):4-16. doi: 10.1093/toxsci/kfac041. PMID: 35404422; PMCID: PMC9238304.
29. Roell K[#], Koval LE*, Boyles R, Patlewicz G, Ring C, Rider CV, Ward-Caviness C, Reif DM, Jaspers I, Fry RC, **Rager JE**⁺⁺. Development of the InTelligence And Machine LEarning (TAME) Toolkit for Introductory Data Science, Chemical-Biological Analyses, Predictive Modeling, and Database Mining for Environmental Health Research. *Front Toxicol*. 2022 Jun 22;4:893924. doi: 10.3389/ftox.2022.893924. PMID: 35812168; PMCID: PMC9257219.
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31. Payton A*[#], Perryman AN, Hoffman JR, Avula V*, Wells H, Robinette C, Alexis NE, Jaspers I, **Rager JE**⁺⁺, Rebuli ME. Cytokine signature clusters as a tool to compare changes associated with tobacco product use in upper and lower airway samples. *Am J Physiol Lung Cell Mol Physiol*. 2022 May 1;322(5):L722-L736. doi: 10.1152/ajplung.00299.2021. PMID: 35318855; PMCID: PMC9054348.
32. Carberry CK*, Turla T*, Koval LE*, Hartwell H, Fry RC, **Rager JE**⁺⁺. Chemical Mixtures in Household Environments: In Silico Predictions and In Vitro Testing of Potential Joint Action on PPAR γ in Human Liver Cells. *Toxics*. 2022 Apr 19;10(5):199. doi: <https://doi.org/10.3390/toxics10050199>. PMID: 35622613. PMCID: PMC9146550.
33. Eaves LA, Keil AP, **Rager JE**, George A, Fry RC. Analysis of the novel NCWELL database highlights two decades of co-occurrence of toxic metals in North Carolina private well water: Public health and environmental justice implications. *Sci Total Environ*. 2022 Mar 15;812:151479. doi: 10.1016/j.scitotenv.2021.151479. PMID: 34767890. PMCID: PMC9733895.
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35. Clark J, Eaves LA, Gaona AR, Santos HP, Smeester L, Bangma JT, **Rager JE**, O'Shea TM, Fry RC. Pre-pregnancy BMI-associated miRNA and mRNA expression signatures in the placenta highlight a sexually-dimorphic response to maternal underweight status. *Sci Rep*. 2021 Aug 3;11(1):15743. doi: 10.1038/s41598-021-95051-1. PMID: 34344912; PMCID: PMC8333418.
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37. **Rager JE**, Clark J, Eaves LA, Avula V, Niehoff NM, Kim YH, Jaspers I, Gilmour MI. Mixtures modeling identifies chemical inducers versus repressors of toxicity associated with wildfire smoke. *Sci Total Environ*. 2021 Jun 25;775:145759. PMID: 33611182. PMCID: PMC8243846.

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51. Wikoff D, **Rager JE**, Chappell GA, Fitch S, Haws L, Borghoff S. A framework for systematic evaluation and quantitative integration of mechanistic data in assessments of potential human carcinogens. *Toxicol Sci*. 2019 Feb 1;167(2):322-335. PMID: 30423162.
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56. Sobus JR, Wambaugh JF, Isaacs KK, Williams AJ, McEachran AD, Richard AM, Grulke CM, Ulrich EM, **Rager JE**, Strynar MJ, Newton SR. Integrating tools for non-targeted analysis research and chemical safety evaluations at the US EPA. *J Expo Sci Environ Epidemiol*. 2018 Sep;28(5):411-426. PMID: 29288256.
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61. **Rager JE**, Ring CL, Fry RC, Suh M, Proctor DM, Haws LC, Harris MA, Thompson CM. High-throughput screening data interpretation in the context of in vivo transcriptomic responses to oral Cr(VI) exposure. *Toxicol Sci*. 2017 Jul 1. 158(1):199-212. PMID: 28472532. PMCID: PMC5837509.
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63. Wikoff DS, **Rager JE**, Haws LC, Borghoff SJ. A high dose mode of action for Tetrabromobisphenol A-induced uterine adenocarcinomas in Wistar Han rats: a critical evaluation of key events in an adverse outcome pathway framework. *Regul Toxicol Pharmacol*. 2016 Jun;77:143-59. PMID: 26828025.
64. Thompson CM, Bichteler A, **Rager JE**, Suh M, Proctor DM, Haws LC, Harris MA. Comparison of in vivo genotoxic and carcinogenic potency to augment mode of action analysis: case study with hexavalent chromium. *Mutat Res Genet Toxicol Environ Mutagen*. 2016 Apr;800-801:28-34. PMID: 27085472.
65. **Rager JE**, Strynar MJ, Liang S, McMahan RL, Richard AM, Grulke CM, Wambaugh JF, Isaacs KK, Judson R, Williams AJ, Sobus JR. Linking high resolution mass spectrometry data with exposure and toxicity forecasts to advance high-throughput environmental monitoring. *Environ Int*. 2016 Mar;88:269-80. PMID: 26812473.
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86. **Rager JE**, Lichtveld K, Ebersviller S, Smeester L, Jaspers I, Sexton KG, Fry RC. A toxicogenomic comparison of primary and photochemically altered air pollutant mixtures. *Environ Health Perspect*. 2011 Nov;119(11):1583-9. PMID: 21757418. PMCID: PMC3226493.
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89. **Rager JE**, Smeester L, Jaspers I, Sexton KG, Fry RC. Epigenetic changes induced by air toxics: formaldehyde exposure alters miRNA expression profiles in human lung cells. *Environ Health Perspect*. 2011 Apr;119(4):494-500. PMID: 23322811. PMCID: PMC3080931.
90. Smeester L, **Rager JE**, Bailey KA, Guan X, Smith N, García-Vargas G, Del Razo LM, Drobná Z, Kelkar H, Stýblo M, Fry RC. Epigenetic changes in individuals with arsenicosis. *Chem Res Toxicol*. 2011 Feb 18;24(2):165-7. PMID: 21291286. PMCID: PMC3042796.

Book Chapters (3 Total; ++Senior Authorship):

1. Clark J, **Rager JE**⁺⁺. Chapter 1. Epigenetics: An Overview of CpG Methylation, Chromatin Remodeling, and Regulatory/Non-coding RNAs. Editor: Fry RC. In: *Environmental Epigenetics in Toxicology and Public Health*, (pp. 3-32). Elsevier. 2020.
2. **Rager JE**⁺⁺. The Role of Apoptosis-associated Pathways as Responders to Contaminants and in Disease Progression. In: *Systems Biology in Environmental Health and Toxicology: From the Genome to the Epigenome*, (pp. 187-203). Book chapter. Academic Press, Elsevier. Editor: McLaughlin MM. 2015.
3. **Rager JE**, Fry RC. Systems Biology and Environmental Exposures. In: *Network biology: Theories, Methods and Applications*, (pp. 81-130) Book chapter. Nova Publishers. Editor: Zhang WJ. 2013.

Published Datasets and Scripts:

1. [Ragerlab-Dataverse](#), Environmental Health Solutions, UNC Dataverse: Published datasets produced from Julia E. Rager's laboratory.
2. [UNC-SRP-Dataverse](#), Environmental Health Solutions, UNC Dataverse: Published datasets produced from the UNC-SRP, with the data management and analysis core (DMAC) co-led by Julia E. Rager.
3. [CEMALB-Dataverse](#), UNC Dataverse: Published datasets produced from the UNC Center for Environmental Medicine and Lung Biology (CEMALB), with the bioinformatics core led by Julia E. Rager.

4. [Ragerlab-Github](#): Ongoing script and small-scale input/output files to enable reproducible findings and ongoing analyses posted online through Github, for research organized through the Ragerlab.
5. [UNC-CEMALB-Github](#): Ongoing script and small-scale input/output files to enable reproducible findings and ongoing analyses posted online through Github, for research organized through the Center for Environmental Medicine, Asthma, and Lung Biology (CEMALB). Julia E. Rager co-leads data analyses with Ilona Jaspers.
6. [UNC-SRP-Github](#): Ongoing script and small-scale input/output files to enable reproducible findings and ongoing analyses posted online through Github, for research and training programs organized through the UNC Superfund Research Program. Julia E. Rager co-leads these analyses and training initiatives.
7. [The inTelligence And Machine lEarning \(TAME\) Data Training Script](#) through [UNC-SRP-Github](#): An online toolkit developed to promote trainee-driven data generation, management, and analysis methods to “TAME” data in environmental health studies. Julia E. Rager lead the development of this toolkit.
8. [Data Training Workshop Script](#) through [Computational-Biosciences-Club-Github](#): Training materials developed in collaboration with UNC’s Computational Biosciences Club to train students on introduction to coding in R/Python, tidyverse and best practices for script formatting, and high dimensional data analyses and visualizations.
9. [PRogramming for Environmental HEalth and Toxicology \(PREHEAT\) Retreat Script](#) through [UNC-SRP-Github](#): A two-day hands-on programming retreat where UNC graduate students received training on data management, github, statistical analyses, and machine learning using a real-world proteomics dataset.
10. NCBI’s Gene Expression Omnibus (GEO): Over 30 [genome-wide datasets](#) published by Julia E. Rager.

Media Releases/Press from Non-Science Organizations:

1. Protect Our Breast Blog Post, Chemical Mixtures: A Recipe for Breast Cancer’. 2022 Oct 24. Available at: <https://protectourbreasts.org/2022/10/24/chemical-mixtures-a-recipe-for-breast-cancer/>

Media Releases/Press from Science Organizations:

1. Environmental Health Perspectives Press: Channels of Communication: Extracellular Vesicles in Environmental Stress and Human Disease. 2024 Jan. Available at: <https://ehp.niehs.nih.gov/doi/10.1289/EHP14224>.
2. Global Environmental Health Newsletter: New Study Uncovers Mechanism of Heart and Lung Responses to Wildfire Smoke. NIEHS. 2023 Apr. Available at: https://www.niehs.nih.gov/research/programs/geh/geh_newsletter/2023/4/spotlight/new_study_uncovers_mechanism_of_heart_and_lung_responses_to_wildfire_smoke.cfm
3. Environmental Factor: Your Online Source for NIEHS News: Computer Modeling Teases out Chemical Toxicants in Wildfire Smoke. 2022 Mar 8. Available at: <https://factor.niehs.nih.gov/2022/4/science-highlights/wildfire-smoke>.

Chairperson of Conference Sessions and/or Workshops (12 Total):

1. Co-Chair of: ‘*Making Sense of Chaos: Recent Advances in Complex Mixtures Research and Regulation*’. Society of Toxicology 63rd Annual Meeting and ToxExpo. March 14, 2024. Chair: Cynthia Rider.
2. Chair of: ‘*Workshop on Using Geographical Information to Promote Environmental Health and Justice*’. Society of Toxicology 63rd Annual Meeting and ToxExpo. March 11, 2024. Co-chair: Cavin Ward-Caviness.
3. Chair of: ‘*PFAS Analytical Workshop and Data Management and Analysis Core Joint Workshop*’. Joint workshop between SRP PFAS Analytical Network and Data Management and Analysis Core (DMAC) at the Annual

- Superfund Research Program Meeting. Raleigh, NC. Dec 14, 2022. Co-chairs: Erin Baker, Lauren Eaves, David Reif, and Michelle Heacock.
4. Chair of: ‘*Superfund Research Program Data Science Training Needs*’. Joint workshop between SRP Research Education Training and Translation (RETCC) and Data Management and Analysis Cores (DMAC) at the Annual Superfund Research Program Meeting. Raleigh, NC. Dec 14, 2022. Co-chairs: Meghan Rebuli, David Reif, and Michelle Heacock.
 5. Chair of: ‘*PRogramming for EEnvironmental Health And Toxicology (PREHEAT) Retreat*’. UNC Curriculum in Toxicology and Environmental Medicine (CiTEM) and Environmental Sciences and Engineering (ENVR) Training Workshop. Chapel Hill, NC. Oct 20-21, 2022.
 6. Chair of: ‘*Application of Computational Modeling and Bioinformatics in Toxicological Hazard and Risk Assessment*’. International Conference on Environmental Mutagens (ICEM). Ottawa, Canada. Aug 28, 2022.
 7. Chair of: ‘*Mining Chemical and Biological Data using High Dimensional Techniques in R/Python*’. Curriculum in Toxicology and Environmental Medicine (CiTEM) T32 Training Program and the Computational Biosciences Club. Virtual Training Workshop. March 22, 2022.
 8. Chair of: ‘*Molecular-based Points of Departure as the new Basis for Chemical Risk Assessment: Are We Ready?*’. Society of Toxicology 60th Annual Meeting and ToxExpo. Virtual. March 23, 2021. Co-chair: Kamin Johnson (Corteva Agriscience).
 9. Chair of: ‘*Integrated Omic Approaches to Toxicity Assessments*’. Society of Toxicology 58th Annual Meeting and ToxExpo. Baltimore, MA. Mar 12, 2019. Co-chair: Scott Auerbach (NTP).
 10. Co-chair of: ‘*Applying Systems Biology Approaches to Understand the Joint Action of Chemical and Nonchemical Stressors*’. Society of Toxicology 58th Annual Meeting and ToxExpo. Baltimore, MA. Mar 11, 2019. Chair: Cynthia Rider (NTP).
 11. Chair of: ‘*From Assay to Assessment: Incorporating High Throughput Strategies into Health and Safety Evaluations*’. Toxicology Forum 41st Annual Winter Meeting, Washington DC. Feb 7, 2017. Co-chairs: Cynthia Rider (NTP) and Reza Rasoulpour (Dow AgroSciences).
 12. Chair of: ‘*Applied Genetic Toxicology*’. Environmental Mutagenesis and Genomics Society 47th Annual Meeting, Kansas City, KA. Sept 26, 2016. Co-Chair: Nan Mei (FDA).

Invited Speaker Presentations (45 Total):

1. *Wildfires: Evaluating Sufficient Similarities and Identifying Drivers of Toxicity within Complex, Highly Variable Smoke Conditions*. Society of Toxicology 63rd Annual Meeting and ToxExpo. Salt Lake City, UT. Mar 14, 2024.
2. *Capturing Divergent Perspectives*, In: Career Development on Solutions-based Strategies for Challenging Scenarios. Society of Toxicology 63rd Annual Meeting and ToxExpo Women in Toxicology (WIT) Specialty Section. Salt Lake City, UT. Mar 11, 2024.
3. *Introduction to Using Geographical Information to Promote Environmental Health and Justice*. Society of Toxicology 63rd Annual Meeting and ToxExpo. Salt Lake City, UT. Mar 11, 2024.
4. *Characterizing the Proteome of Extracellular Vesicles in the Respiratory Tract and their Roles in Wildfire Smoke Toxicity*. UNC Mass Spectrometry Seminar Series. Chapel Hill, NC. Feb 21, 2024.
5. *Enhancing New Approach Methodologies (NAMs) through Computational Toxicology Methods and Environmental Health Applications*. The U.S. Environmental Protection Agency (U.S. EPA) Computational Toxicology and Exposure Science Division. Durham, NC. Feb 13, 2024.
6. *Wildfire Smoke Mixtures Toxicity Testing*. The U.S. Environmental Protection Agency (U.S. EPA) Development of Innovative Approaches to Assess the Toxicity of Chemical Mixtures STAR Grantee Progress Meeting. Durham, NC. Virtual. Oct 4, 2023.
7. *Wildfire Health Risks: Understanding the Chemical Drivers and Underlying Mechanisms of Highly Variable Smoke Exposure Conditions*. University of California at Davis (UC Davis) Environmental Health Sciences Center Seminar Series. Davis, CA. Virtual. Sept 19, 2023.

8. *The inTelligence And Machine LEarning (TAME) Toolkit for Introductory Data Science in Environmental Health*. NIH Office of Data Science (ODS) Webinar. Virtual. Jul 18, 2023.
9. *Wildfire Health Risks and Environmental Justice Concerns*. University of North Carolina (UNC) Equity and Environmental Justice (QUEST) Program. Chapel Hill, NC. May 24, 2023.
10. *Wildfire Health Risks: Understanding the Chemical Drivers and Underlying Mechanisms of Highly Variable Smoke Exposure Conditions*. University of North Carolina (UNC) Air Pollution Research Seminar Series. Chapel Hill, NC. Apr 24, 2023.
11. *Wildfire Health Risks: Understanding the Chemical Drivers and Underlying Mechanisms of Highly Variable Smoke Exposure Conditions*. North Carolina State University (NCSU) Toxicology Program Seminar Series. Raleigh, NC. Mar 7, 2023.
12. *Using a Systematic Review and CompTox Data Case Study: Environmental Exposures and Extracellular Vesicles*. Duke University Toxicology & Environmental Health Symposium: How to Conduct Environmental Health Research for Use in Regulatory and Policy Arenas. Durham, NC. Feb 17, 2023.
13. *The inTelligence And Machine LEarning (TAME) Toolkit for Introductory Data Science in Environmental Health*. NIH Annual Superfund Research Program (SRP) Meeting. Raleigh, NC. Dec 16, 2022.
14. *Wildfire Health Risks: Understanding the Chemical Drivers and Underlying Mechanisms of Highly Variable Smoke Exposure Conditions*. National Institutes of Environmental Health Science (NIEHS) Risk e-Learning Webinar Series: Climate Change and Health. Virtual. Nov 4, 2022.
15. *Improving the Utility of In Vitro Screening through Combined In Silico Modeling to Better Predict and Test Health Risks of Environmental Chemicals*. International Conference on Environmental Mutagens (ICEM). Ottawa, Canada. Aug 28, 2022.
16. *Data Science Approaches to Identify Drivers of Human Disease within the Expanding Exposome*. National Institutes of Health (NIH). Complex Exposures in Breast Cancer: Unraveling the Role of Environmental Mixtures Workshop. Virtual. Aug 25, 2022.
17. *HESI Flash Talk: Deriving and Providing Training on Molecular-based PODs Leveraging Multi-Omic Signatures and New Disease Mediators*. Health and Environmental Sciences Institute (HESI). Molecular Points of Department Working Group. Virtual. May 12, 2022.
18. *DMAC Quarterly Meeting: How can we offer Data Science training to support SRP needs?* NIH Superfund Research Program (SRP). Data Management and Analysis Core (DMAC) Meeting. Virtual. May 11, 2022.
19. *Data Science in Environmental Health: Training through the inTelligence And Machine LEarning (TAME) Toolkit*. US Environmental Protection Agency. ToxCast Working Group. Virtual. May 4, 2022.
20. *Improving Mixtures Health Assessments: Combining In Silico with In Vitro / In Vivo Models to Evaluate Co-Occurring Contaminants*. National Institutes of Health (NIH). Combined Exposures/Exposome Mixtures Focus Group. Virtual. Mar 8, 2022.
21. *NCSOT Career Symposium Speaker*. North Carolina Society of Toxicology. Virtual. Oct 5, 2021.
22. *Introduction to Molecular-based Points of Departure as the New Basis for Chemical Risk Assessment: Are We Ready?* Society of Toxicology. Virtual. Mar 23, 2021.
23. *NCSOT Career Symposium Speaker*. North Carolina Society of Toxicology. Virtual. Sept 21, 2020.
24. *Modernizing the evaluation of health risks resulting from environmental exposures*. Duke University. Durham, NC. May 19, 2020.
25. *HESI eSTAR Carcinogenomics Project data compilation update*. The Health and Environmental Sciences Institute Annual Meeting. Washington, DC. Oct 29, 2019.
26. *The placental exposome: a driver of epigenetic regulation and preeclampsia*. The North Carolina Society of Toxicology Annual Meeting. Durham, NC. Oct 7, 2019.
27. *Too many chemicals, too little time: Approaches to modernize risk assessment*. The Environmental Sciences and Engineering Seminar Series, The University of North Carolina, Chapel Hill, NC. Aug 28, 2019.
28. *NIEHS Career Symposium Speaker*. 22nd Annual NIEHS Biomedical Career Symposium. Research Triangle Park, NC. Apr 26, 2019.

29. *Links between arsenic-associated DNA methylation and bladder cancer*. The Society of Toxicology 58th Annual Meeting and ToxExpo. Baltimore, MA. Mar 14, 2019.
30. *Setting the stage: understanding biological pathways across toxicological tools*. The Society of Toxicology 58th Annual Meeting and ToxExpo. Baltimore, MA. Mar 11, 2019.
31. *Advances in toxicological tools to understand pathways involved in exposure-induced disease*. UNC Curriculum of Toxicology Seminar Series, Chapel Hill, NC. Mar 4, 2019.
32. *Integrating in vitro and non-targeted analyses into human health risk assessments*. The Long-Range Research Initiative Annual Meeting, Research Triangle Park, NC. Oct 4, 2018.
33. *How can we use 21st century exposure science and toxicology to improve global public health?* The Institute for Environmental Health Solutions Seminar, University of North Carolina, Chapel Hill, NC. May 2, 2018.
34. *Connecting the genome, epigenome, and exposome to evaluate the impact of environmental exposures*. Department of Environmental and Molecular Toxicology Seminar Series, Oregon State University, Corvallis, OR. Aug 9, 2017.
35. *NIEHS Career Symposium Speaker*. 20th Annual NIEHS Biomedical Career Symposium. Research Triangle Park, NC. Apr 21, 2017.
36. *Innovative screening methods to identify chemical exposure signatures and linkages to toxicity: case study with house dust*. Society of Toxicology 56th Annual Meeting and ToxExpo. Baltimore, MA. Mar 13, 2017.
37. *Integration of high content and high throughput screening predictions to inform ongoing metals risk assessments*. The Toxicology Forum 41st Annual Winter Meeting, Washington DC. Feb 7, 2017.
38. *Integration of high content and high throughput screening data to inform hexavalent chromium mode of action*. Environmental Mutagenesis and Genomics Society 47th Annual Meeting, Kansas City, KA. Sept 26, 2016.
39. *A non-targeted method to screen for emerging contaminants in dust*. The Association of Public Health Laboratories Webinar Series, Research Triangle Park, NC. May 6, 2015.
40. *Epigenetic effects of formaldehyde exposure*. The National Toxicology Program, Research Triangle Park, NC. Apr 25, 2014.
41. *Systems biology: unraveling transcriptional responses to environmental mixtures*. The Toxicology and Risk Assessment Conference, West Chester, OH. Apr 9, 2014.
42. *Epigenetic effects of formaldehyde exposure*. The Lovelace Research Institute, Albuquerque, NM. Mar 21, 2014.
43. *Formaldehyde-induced changes in microRNA signaling and links to DNA damage*. Syngenta. Greensboro, NC. Apr 16, 2013.
44. *Formaldehyde: big effects from small molecules*. The Environmental Sciences and Engineering Seminar Series, The University of North Carolina, Chapel Hill, NC. Sept 5, 2012.
45. *Epigenetic effects of formaldehyde exposure*. The Society of Toxicology 51st Annual Meeting and ToxExpo, San Francisco, CA. Mar 14, 2012.

Ragerlab Student-led Oral Presentations (18 Total; ++ Senior Authorship; *Ragerlab trainee, #Ragerlab data analyst)

1. **Carberry C***, **Rager JE⁺⁺**. Incorporating extracellular vesicle mediators of PFAS toxicity into NAMs-based points of department: a comparison against transcriptomic-based risk values. Mar 13, 2024. Society of Toxicology 63rd Annual Meeting and ToxExpo. Salt Lake City, UT.
2. **Hickman E***, **Rager JE⁺⁺**. Application of Machine Learning to Human Clinical and In Vitro Molecular Response Profiles to Unravel Key Mechanisms of Emerging Inhaled Toxicants. Mar 11, 2024. Society of Toxicology 63rd Annual Meeting and ToxExpo. Salt Lake City, UT.
3. **Carberry C***, **Rager JE⁺⁺**. EV-olving Liver Health: The Effects of PFAS Mixtures on Extracellular Vesicle Regulation and Contents. Nov 8, 2023. UNC Environmental Sciences and Engineering Seminar Series. Chapel Hill, NC.

4. **Koval LE***, **Rager JE⁺⁺**. Random Access Mammary: Using Computational Approaches to Investigate Environmental Chemicals and Breast Cancer Risk. Oct 18, 2023. UNC Environmental Sciences and Engineering Seminar Series. Chapel Hill, NC.
5. **Hickman E***, Frey F, Wylie A, Hartwell H, Roell K[#], Fry RC, Stapleton HM, Propper C, **Rager JE⁺⁺**. Chemical and Non-Chemical Stressors in a Perinatal Cohort through Wristband and Self Report Data: Novel Links between Increased Chemical Burden and Economic and Racial Stress. North Carolina Society of Toxicology (NC SOT), Sept 14, 2023. Invited Presentation, Selected as President's Award for Research Competition (PARC) Finalist (1st Place). Research Triangle Park, NC.
6. **Hickman E***. Types of Scientific Careers and Graduate School Options. University of North Carolina Future Researchers for Environmental Solutions and Health (FRESH) Outcomes Internship for High School Students, Jun 30, 2023. Chapel Hill, NC.
7. **Koval LE***. Introduction to Computational Analysis of Large, Multi-Omic Datasets. University of North Carolina Future Researchers for Environmental Solutions and Health (FRESH) Outcomes Internship for High School Students, Jun 29, 2023. Chapel Hill, NC.
8. **Carberry C***. Overview of PFAS and their Health Effects. University of North Carolina Future Researchers for Environmental Solutions and Health (FRESH) Outcomes Internship for High School Students, Jun 28, 2023. Chapel Hill, NC.
9. **Hickman E***. Tools for Creating Scientific Presentations. University of North Carolina Future Researchers for Environmental Solutions and Health (FRESH) Outcomes Internship for High School Students, Jun 28, 2023. Chapel Hill, NC.
10. **Miller S***. Introduction to Cell Culture-based Models and Techniques. University of North Carolina Future Researchers for Environmental Solutions and Health (FRESH) Outcomes Internship for High School Students, Jun 26, 2023. Chapel Hill, NC.
11. **Hickman E***, **Rager JE⁺⁺**. The Intersection of Extracellular Vesicles, Wildfire Smoke, and Asthma. University of North Carolina Curriculum in Toxicology and Environmental Medicine (CiTEM) Seminar Series, Apr 24, 2023. Chapel Hill, NC.
12. **Carberry C***, **Rager JE⁺⁺**. Extracellular Vesicles altered by Per- and Polyfluoroalkyl Substance Mixtures: In Vitro Dose-Dependent Release, Chemical Content, and MicroRNA Signatures involved in Liver Health. North Carolina Society of Toxicology (NC SOT), Oct 19, 2022. Invited Presentation, Selected as Graduate Student Best Presentation Finalist (3rd Place). Durham, NC.
13. **Payton A*[#]**, **Rager JE⁺⁺**. Quantitative Methods for Data Aggregation, Reduction, Scoring, and Clustering for Inhaled Toxicant Research. Environmental Bioinformatics Research Group, Apr 26, 2022. Invited Virtual Presentation.
14. **Koval LE***, **Rager JE⁺⁺**. Environmental Mixtures linked to Breast Cancer Etiology: Identifying New Exposure Patterns using Chemical Inventory Informatics. Silent Spring Institute, Sept 30, 2021. Invited Virtual Presentation.
15. **Payton A***, Perryman A, Rebuli M, Jaspers I, **Rager JE⁺⁺**. Multi-region comparison of immune mediators from human respiratory tract samples: baseline signatures, eigenvector analyses, and tobacco product effects. UNC Department of Environmental Sciences and Engineering's Centennial Celebration, Apr 8, 2021. Virtual Presentation.
16. **Carberry C***, Ferguson S, Beltran A, Fry R, **Rager JE⁺⁺**. Using liver models generated from human induced pluripotent stem cells (iPSCs) for evaluating maternal, fetal, and child health outcomes. UNC Department of Environmental Sciences and Engineering's Centennial Celebration, Apr 8, 2021. Virtual Presentation.
17. **Payton A***, Clark J, Eaves L, Santos HP, Smeester L, Bangma JT, O'Shea TM, Fry RC, **Rager JE⁺⁺**. Placental Genomic and Epigenomic Signatures Associated with Infant Birth Weight Highlight Mechanisms Involved in Collagen and Growth Factor Signaling. North Carolina Society of Toxicology (NC SOT) Annual Meeting, Sept 17, 2020. Durham, NC / Virtual Speed Talk.
18. **Carberry C***, Szilagyi J, Chao A, Grossman J, Lu K, Boggess K, Sobus J, Fry RC, **Rager JE⁺⁺**. Integrated Genomic, Epigenomic, and Exposomic Analysis of Placentas from Preeclamptic Patients Identifies Links to

Ragerlab Student-led Poster Presentations (25 Total; ++ Senior Authorship; *Ragerlab trainee, #Ragerlab data analyst)

1. **Koval LE***, Everett L, Harrill J, Judson R, **Rager JE⁺⁺**. Identifying Genes Predictive of Breast Cancer-associated Chemicals through Machine Learning Analysis of High-Throughput Transcriptomic Screening Data across MCF7 Cells. Society of Toxicology 63rd Annual Meeting and ToxExpo. Mar 13, 2024. Salt Lake City, UT.
2. **Miller S***, Chappel J, Hickman E, Koval L, Kim Y, Rebuli ME, Jaspers I, Rider C, Reif D, **Rager JE⁺⁺**. Anchoring biomass smoke exposures to human pulmonary disease outcomes: Transcriptomic similarity scoring identifies influenza and COVID-19 as primary outcomes influenced by wildfire exposures. Society of Toxicology 63rd Annual Meeting and ToxExpo. Mar 11, 2024. Salt Lake City, UT.
3. **Hickman E***, Frey F, Wylie A, Hartwell H, Fry RC, Stapleton HM, Propper C, **Rager JE⁺⁺**. Chemical and Non-Chemical Stressors in a Postpartum Cohort through Wristband and Self Report Data: Novel Links between Increased Chemical Burden, Economic, and Racial Stress. Society of Toxicology 63rd Annual Meeting and ToxExpo. Mar 11, 2024. Salt Lake City, UT.
4. **Chou CK***, **Miller S***, **Hickman E***, **Carberry CK***, Hartwell H, **Rager JE⁺⁺**. MicroRNA-146a as a mediator of methoxyphenol protection against acute lung injury in human airway epithelial cells. 2023 UNC BBSP Fall Rotation Poster Session. Nov 8, 2023. Chapel Hill, NC.
5. **Miller S***, **Hickman E***, **Koval L***, Chappel J, Kim YH, Rebuli M, Jaspers I, Rider D, Reif D, **Rager JE⁺⁺**. Transcriptomics similarity scoring using toxicological databases to anchor in vivo wildfire smoke exposure data to human pulmonary disease signatures. North Carolina Society of Toxicology (NC SOT) Presentation, Sept 14, 2023. Durham, NC.
6. **Malone K***, **Miller S***, **Hickman E***, Fry RC, **Rager JE⁺⁺**. The Role of Methoxyphenols in Wildfire Smoke Inhalation Toxicity. Institute for Environmental Health Solutions (IEHS) QUEST Program Presentation, Aug 1, 2023. Chapel Hill, NC.
7. **Simendinger L***, **Carberry C***, Fry RC, **Rager JE⁺⁺**. Effects of Per and Polyfluoroalkyl Substances on Liver Cell Derived Extracellular Vesicle Regulation and Function. Institute for Environmental Health Solutions (IEHS) QUEST Program Presentation, Aug 1, 2023. Chapel Hill, NC
8. **Hickman E***, Simmons A, Wheeler M, Auerbach SS, McCullough SD, **Rager JE⁺⁺**. Interindividual Variability Assessments through Benchmark Dose-Response Modeling of Primary Human Bronchial Epithelial-Fibroblast Co-Culture Responses to Acrolein. Curriculum in Toxicology and Environmental Medicine (CiTEM) Annual Retreat, Jun 23, 2023. Chapel Hill, NC.
9. **Carberry CK***, **Koval L***, Bangma J, Strynar M, **Keshava D***, Hartwell H, Sokolsky M, Fry RC, and **Rager JE⁺⁺**. Extracellular Vesicles altered by Per- and Polyfluoroalkyl Substance Mixtures: In Vitro Concentration-Dependent Release, Chemical Content, and MicroRNA Signatures involved in Liver Health. Society of Toxicology (NCSOT) Annual Meeting and ToxExpo, Mar 22, 2023. Nashville, TN.
10. **Koval LE***, Dionisio KL, Friedman KP, Isaacs KK, Rager JE. Environmental Mixtures and Breast Cancer: Identifying Co-Exposure Patterns between Understudied vs Breast Cancer-Associated Chemicals using Chemical Inventory Informatics. Society of Toxicology Annual Meeting, Mar 22, 2023. Nashville, TN.
11. **Hickman E***, Simmons A, Wheeler M, Auerbach SS, McCullough SD, **Rager JE⁺⁺**. Interindividual Variability Assessments through Benchmark Dose-Response Modeling of Primary Human Bronchial Epithelial-Fibroblast Co-Culture Responses to Acrolein. Society of Toxicology (SOT) Annual Meeting, Mar 21, 2023. Nashville, TN.
12. **McDermott E***, Hartwell H, **Winker R***, **Rager JE⁺⁺**. Biomass Smoke Mixtures Indicative of Wildland vs. Wildland Urban Interface Exposures Induce Changes in Hypoxia Inducible Factor 1-alpha (HIF1a) Responses in Lung Cells. Society of Toxicology (SOT) Annual Meeting and ToxExpo, Mar 21, 2023. Nashville, TN.
13. **Winker R***, **McDermott E***, Brown E, **Payton A[#]**, Fry RC, **Rager JE⁺⁺**. Examining Demographic Disparities in Wildfire Exposure and Risk in North Carolina. Superfund Research Program (SRP) Annual Meeting, Dec 15, 2022. Raleigh, NC.

14. **Koval LE***, **Carberry CK***, Kim YH, **McDermott E***, Hartwell H, Jaspers I, Gilmour MI, **Rager JE⁺⁺**. Wildfire Variable Health Risks: Identifying Biomass Smoke Exposure Groupings through Transcriptomic Similarity Scoring. North Carolina Society of Toxicology (NC SOT), Oct 19, 2022. Durham, NC.
15. **Koval LE***, **McDermott E***, **Carberry CK***, Kim YH, Jaspers I, Gilmour MI, **Rager JE⁺⁺**. Wildfire Variable Health Risks: Identifying Biomass Smoke Exposure Groupings through Transcriptomic Similarity Scoring. International Society of Exposure Science (ISES), Sept 26, 2022. Lisbon, Portugal.
16. **Keshava D***, **Carberry C***, **Rager JE⁺⁺**. Extracellular Vesicles are Impacted by Per- and Polyfluoroalkyl Substances in Human Liver Cells. International Conference on Environmental Mutagens (ICEM), Aug 30, 2022. Ottawa, Canada.
17. **Keshava D***, **Carberry C***, Brown E, Fry RC, **Rager JE⁺⁺**. Environmental Justice Analysis of Water Contaminant Data Highlights Populations at Heightened Risk of Exposure to Per- and Polyfluoroalkyl Substances (PFAS). Institute for Environmental Health Solutions (IEHS) Summer QUEST Meeting, Aug 5, 2022. Chapel Hill, NC.
18. **Winker R***, **McDermott E***, Brown E, Fry RC, **Rager JE⁺⁺**. Examining Demographic Disparities in Wildfire Exposure and Risk in North Carolina. Equity and Environmental Justice (QUEST) Program Presentation, Aug 5, 2022. Chapel Hill, NC.
19. **Carberry CK***, **Koval LE***, **Payton A***, Hartwell H, Kim YH, Smith GJ, Reif DM, Jaspers I, Gilmour MI, **Rager JE⁺⁺**. Wildfire and Extracellular Vesicles: Linking Cardiopulmonary Hypoxia Signaling Alterations across Tissues in Mice Exposed to Variable Biomass Smoke. Society of Toxicology (SOT) Annual Meeting, Mar 29, 2022. San Diego, CA.
20. **Keshava Deepak***, **Carberry C***, **Rager JE⁺⁺**. Extracellular Vesicles are Impacted by Per- and Polyfluoroalkyl Substances in Human Liver Cells. North Carolina Society of Toxicology (NC SOT) Annual Meeting, Jan 19, 2022. Research Triangle Park, NC / Virtual.
21. **Carberry C***, **Koval L***, **Payton A***, Hartwell H, Kim YH, Smith GJ, Reif DM, Jaspers I, Gilmour MI, **Rager JE⁺⁺**. Wildfire and Extracellular Vesicles: Cardiopulmonary Cross-Tissue Hypoxia Signaling Alterations Linked through Exosomal MicroRNAs in Mice Exposed to Biomass Smoke. North Carolina Society of Toxicology (NC SOT) Annual Meeting, Jan 19, 2022. Research Triangle Park, NC / Virtual.
22. **Turla T***, **Carberry C***, **Rager JE⁺⁺**. Cell Response to Understudied Chemicals in Everyday Household Environments. UNC Department of Environmental Sciences and Engineering FIRE Program Presentation, Aug 5, 2021. Chapel Hill, NC.
23. **Keshava D***, **Carberry C***, **Rager JE⁺⁺**. Extracellular Vesicles are Impacted by Per- and Polyfluoroalkyl Substances in Human Liver Cells. UNC Department of Environmental Sciences and Engineering FIRE Program Presentation, Aug 5, 2021. Chapel Hill, NC.
24. **Payton A***, Clark J, Eaves L, Santos HP, Smeester L, Bangma JT, O'Shea TM, Fry RC, **Rager JE⁺⁺**. Placental Genomic and Epigenomic Signatures Associated with Infant Birth Weight Highlight Mechanisms Involved in Collagen and Growth Factor Signaling. North Carolina Society of Toxicology (NC SOT) Annual Meeting, Sept 17, 2020. Durham, NC / Virtual.
25. **Carberry C***, Szilagyi J, Chao A, Grossman J, Lu K, Boggess K, Sobus J, Fry RC, **Rager JE⁺⁺**. Integrated Genomic, Epigenomic, and Exposomic Analysis of Placentas from Preeclamptic Patients Identifies Links to Acetaminophen and Altered Apoptosis Signaling. North Carolina Society of Toxicology (NC SOT) Annual Meeting, Oct 7, 2019. Durham, NC.

Other Poster Presentations (15 Total First or Senior ⁺⁺ Authorship)

1. Klaren WD, Ring C, Thompson CM, Borghoff S, Harris MA, Sipes NS, Hsieh J, Auerbach SS, **Rager JE⁺⁺**. Identifying Attributes that Influence In Vitro-to-In Vivo Concordance by Comparing In Vitro Tox21 Bioactivity versus In Vivo DrugMatrix Transcriptomic Responses across 130 Chemicals. Society of Toxicology (SOT) 57th Annual Meeting and ToxExpo, Mar 13, 2018. San Antonio, TX.
2. **Rager JE**, Chappell G, Wikoff D, Borghoff S, Thompson CT. Epigenetic Trends in Responses to Chemical Exposures and Relationships to Disease: A Review on Directional Consistencies. Environmental Mutagenesis and Genomics Society (EMGS) 48th Annual Meeting, Sept 10, 2017. Raleigh, NC.

3. **Rager JE**, Thompson CM, Auerbach S, Fry RC. Integrating Genomic and Epigenomic Data into Risk Assessment Applications through Dose Response Modeling: Case Study with Prenatal Arsenic Exposure. Environmental Mutagenesis and Genomics Society (EMGS) 47th Annual Meeting, Sept 25, 2016. Kansas City, KA.
4. **Rager JE**, Strynar MJ, Liang S, McMahan RL, Richard AM, Grulke CM, Wambaugh JF, Isaacs KK, Judson R, Williams AJ, Sobus JR. Linking High Resolution Mass Spectrometry Data with Exposure and Toxicity Forecasts to Advance High-Throughput Environmental Monitoring. Society of Toxicology (SOT) 55th Annual Meeting and ToxExpo, Mar 17, 2016. New Orleans, LA.
5. **Rager JE**, Strynar MJ, Liang S, McMahan RL, Richard AM, Grulke CM, Wambaugh JF, Isaacs KK, Judson R, Williams AJ, Sobus JR. Linking High Resolution Mass Spectrometry Data with Exposure and Toxicity Forecasts to Advance High-Throughput Environmental Monitoring. FutureTox III: Bridges for Translation Meeting, Nov 20, 2015. Washington, DC.
6. **Rager JE**, Tilley SK, Tulenko SE, Smeester L, Ray PD, Yosim A, Currier JM, Ishida MC, González-Horta Mdel C, Sánchez-Ramírez B, Ballinas-Casarrubias L, Gutiérrez-Torres DS, Drobná Z, Del Razo LM, García-Vargas GG, Kim WY, Zhou YH, Wright FA, Stýblo M, Fry RC. Identification of Novel Gene Targets and Putative Regulators of Arsenic-Associated DNA Methylation in Human Urothelial Cells and Bladder Cancer. Society of Toxicology (SOT) 54th Annual Meeting and ToxExpo, Mar 25, 2015. San Diego, CA.
7. **Rager JE**, Bailey KA, Smeester L, Miller SK, Parker JS, Laine JE, Drobná Z, Currier J, Douillet C, Olshan AF, Rubio-Andrade M, Stýblo M, García-Vargas G, Fry RC. Prenatal Arsenic Exposure and the Epigenome: Altered MicroRNAs Associated with Innate and Adaptive Immune Signaling in Newborn Cord Blood. Society of Toxicology (SOT) 53rd Annual Meeting and ToxExpo, Mar 25, 2014. Phoenix, AZ.
8. **Rager JE**, Moeller BC, Doyle-Eisele M, Kracko D, Swenberg JA, Fry RC. Formaldehyde-Induced Changes in MicroRNA Signaling. Visiting Pulmonary Scholar Symposium, May 8, 2013. Chapel Hill, NC.
9. **Rager JE**, Moeller BC, Doyle-Eisele M, Kracko D, Swenberg JA, Fry RC. Formaldehyde-Induced Changes in MicroRNA Signaling. Society of Toxicology (SOT) 52nd Annual Meeting and ToxExpo, Mar 12, 2013. San Antonio, TX.
10. **Rager JE**, Moeller BC, Doyle-Eisele M, Kracko D, Swenberg JA, Fry RC. Formaldehyde-Induced Changes in MicroRNA Signaling. North Carolina Society of Toxicology (NC SOT) Annual Meeting, Feb 21, 2013. Research Triangle Park, NC.
11. **Rager JE**, Smeester L, Jaspers I, Sexton KG, Fry RC. Epigenetic Effects of Formaldehyde Exposure. Visiting Pulmonary Scholar Symposium, May 2, 2012. Chapel Hill, NC.
12. **Rager JE**, Lichtveld K, Ebersviller S, Smeester L, Jaspers I, Sexton KG, Fry RC. A Toxicogenomic Comparison of Primary and Photochemically Altered Air Pollutant Mixtures. International Toxicology of Mixtures Conference, Oct 21, 2011. Arlington, VA.
13. **Rager JE**, Lichtveld K, Ebersviller S, Smeester L, Jaspers I, Sexton KG, Fry RC. A Toxicogenomic Comparison of Primary and Photochemically Altered Air Pollutant Mixtures. Visiting Pulmonary Scholar Symposium, Apr 27, 2011. Chapel Hill, NC.
14. **Rager JE**, Lichtveld K, Ebersviller S, Smeester L, Jaspers I, Sexton KG, Fry RC. A Toxicogenomic Comparison of Primary and Photochemically Altered Air Pollutant Mixtures. Society of Toxicology (SOT) 50th Annual Meeting and ToxExpo, Mar 8, 2011. Washington, DC.
15. **Rager JE**, Smeester L, Jaspers I, Sexton KG, Fry RC. Epigenetic Changes Induced by Air Toxics: Formaldehyde Exposure Alters MicroRNA Expression Profiles in Human Lung Cells. Environmental Mutagen Society (EMS) 41st Annual Meeting. Oct 25, 2010. Fort Worth, TX.

Teaching Activities

Course Director

ENVR 500, UNC

Spring, 2024- present

Title: “**Environmental Processes, Exposure, and Risk Assessment.**” Course instructor: Julia Rager. Role in course: Course director.

Course Director

ENVR 730, UNC

Fall, 2021- present

Title: “**Computational Toxicology and Exposure Science.**” Course instructor: Julia Rager. Role in course: Course director.

Course Director and Co-Instructor **ENVR 500, UNC** **Fall, 2019- 2022**

Title: “**Environmental Processes, Exposure, and Risk Assessment.**” Course instructors: Julia Rager, Orlando Coronell, and Jason Surratt. Role in course: Course director and co-instructor.

Guest Lecturer **ENVR 240, UNC** **Spring, 2019- present**

Title: “**Introduction to Human Exposure and Health Effects Research.**” Course instructors: Rebecca Fry and student leads from IEHS. Role in course: Guest lecturer on topic of computational toxicology.

Guest Lecturer **BIO 592, NCSU** **Spring, 2019- 2021**

Title: “**Computational Environmental Sciences and Toxicology.**” Course instructors: David Reif, Fred Wright, Denis Fourches, and Yi-Hui Zhou. Role in course: Guest lecturer on topic of exposomics.

Guest Lecturer **EPID 742, UNC** **Spring, 2019**

Title: “**Biomarkers in Population-Based Research.**” Course instructor: Stephanie Engel. Role in course: Guest lecturer on topic of microRNAs as biomarkers of exposure and effect.

Guest Lecturer **ENVR 430, UNC** **Fall, 2019- present**

Title: “**Health Effects of Environmental Agents.**” Course instructors: Kun Lu. Role in course: Guest lecturer on topic of epigenetics.

Guest Lecturer **ENVR 442, UNC** **Fall, 2018- present**

Title: “**Molecular and Biochemical Toxicology.**” Course instructors: Gregory Smith. Role in course: Guest lecturer on topic of computational toxicology and risk assessment.

Guest Lecturer **ENVR 630, UNC** **Fall, 2011-2020**

Title: “**Systems Biology in Environmental Health.**” Course instructor: Rebecca Fry. Role in course: Guest lecturer for classes on computational toxicology and benchmark dose-response modeling.

Contracts and Grant Support

Active Grant Support:

- National Institutes of Health (NIH) **(Jaspers)** 03/01/2024-12/31/2028
Total Amount: **\$2,660,064**
Grant No: R01HL171967
Health effects of cannabidiol vaping products
Role: Co-Investigator
- National Institutes of Health (NIH) **(Hickman/Rager)** 06/01/2024-05/31/2025
Total Amount: **\$69,500**
Grant No: 1F32ES036096-01
Mechanisms of wildfire smoke toxicity and susceptibility involving extracellular vesicles in humans
F32 Training Support for Post-doctoral Researchers
Role: Lead Principal Investigator (PI), Supporting Postdoctoral Fellow
- National Institutes of Health (NIH) **(Rager)** 03/20/2024-12/31/2028
Total Amount: **\$3,029,339**
Grant No : 1R01ES035878-01
Wildland Urban Interface Exposure Toxicity in Cells, Animals, and Humans
ONES/R01 for the Outstanding New Environmental Scientist (ONES) Program
Role: Principal Investigator (PI)

- School of Medicine Core Facilities Advocacy Committee (**Rager/Hickman**) 12/15/2023-12/15/2024
Total Amount: **\$9,600**
Pilot data for elucidating the role of extracellular vesicles in respiratory responses to wildfire smoke
Role: Co-Principal Investigator (MPI) of Pilot Project with postdoctoral fellow
- Gillings Place and Health Pilot Funding Program (**Rager**) 07/01/2023-06/30/2024
Total Amount: **\$30,000**
Identifying NC communities at risk for climate change stressors and socioeconomic/disease vulnerabilities
Role: Principal Investigator (PI)
- CEHS Pilot Project Award Program (**Rager/Cohen**) 03/01/2023-02/28/2024
Total Amount: **\$25,000**
Screening environmental chemicals linked to Alzheimer's disease using novel tau sensor cells
Role: Co-Principal Investigator (MPI)
- CEHS Pilot Project Award Program (**Rager**) 03/01/2023-02/28/24
Total Amount: **\$25,000**
Extracellular vesicles altered by per- and polyfluoroalkyl substance mixtures: in vitro regulation and biological impacts on liver health
Role: Principal Investigator (PI)
- CEHS Rapid Response Projects Program (**Rager/Hickman**) 02/01/2023-02/28/2024
Total Amount: **\$15,000**
Pilot data for tracing wildfire-induced intercellular communication throughout the respiratory tract through extracellular vesicle technologies
Role: Co-Principal Investigator (MPI) of Pilot Project with postdoctoral fellow
- U.S. Environmental Protection Agency (US EPA) (**Rager**) 10/01/2022-09/30/2025
Total Amount: \$600,000
Grant No: STAR 84045801
Title: Wildfire Smoke Mixtures Toxicity Testing
Role: Principal Investigator (PI)
- U.S. Environmental Protection Agency (US EPA) (Jaspers) 04/01/2022-01/31/2025
Total Amount: \$4,484,659 (\$793,600 for Computational and Data Science Program Co-Lead by Rager)
Grant No: 84033801
Title: Convergence Science in Environmental Health (COSINE)
Role: Co-Lead of the Computational and Data Science Program
- National Institutes of Health (NIH) (Engel/Lin) 07/01/2021-06/30/2026
Total Amount: **\$2,499,999**
Grant No: R01 ES033518
Title: Early Life Phthalate Exposure in Relation to Structural and Functional Brain Development
Role: Co-Investigator
- National Institutes of Health (NIH) (Fry) 02/20/2020-01/31/2025
Total Amount: **\$12,240,000 (\$1,264,960 for DMAC Co-Lead by Rager)**
Grant No: NIEHS P42ES031007
Title: The UNC Chapel Hill Superfund Research Program (UNC-SRP)
Role: Co-Lead of the Data Management and Analysis Core (DMAC) and Co-Investigator of the Research Training and Translation Core (RETCC)

Prior Grant Support:

- National Institutes of Health (NIH) (**Rager/Jaspers**) 04/17/2020-03/31/2023
Total Amount: **\$417,518**
Grant No: NIEHS 1R21ES031740
Title: Integrative chemical-biological profiling to determine primary drivers of wildfire smoke-induced toxicity

Role: Contact Principal Investigator (MPI)

- National Institutes of Health (NIH) (Jaspers/**Rager**) 08/27/2021-06/30/2022
Total Amount: \$83,000
Grant No: T32ES007126
Title: The UNC inTelligence And Machine lEarning (TAME) training program
Role: Co-Principal Investigator (Co-PI)
- National Institutes of Health (NIH) (**Rager**) 08/01/2021-07/30/2022
Total Amount: \$50,000
Grant No: HHEAR Pilot and Feasibility Program Project PF-04
Testing mothers' silicone wristbands collected at 6- and 18-months postpartum for household chemicals associated with child neurodevelopment.
Role: Contact Principal Investigator (PI)
- IEHS Cancer Survivors Award (**Rager**) 05/01/2019-04/30/2020
Total Amount: \$25,000
Endocrine disrupting chemicals in the household environment: Implications for breast cancer survivors
Role: Principal Investigator (PI) of Pilot Project
- CEHS Pilot Projects Program (**Rager**) 04/01/2019-03/31/2020
Total Amount: \$50,000
The placental exposome: a driver of epigenetic regulation and preeclampsia
Role: Principal Investigator (PI) of Pilot Project
- National Institutes of Health (NIH) (Dunson/Herring) 03/01/2018–02/28/2022
Total Amount: \$432,553
Grant No. NIH 5R01ES028804-02
Structured nonparametric methods for mixtures of exposures
Role: Co-Investigator (Co-I)
- ICCA Long-Range Research Initiative (LRI) (**Rager**) 01/01/2018–12/31/2019
Total Amount: \$120,000
Predicting pathway alterations involved in in vivo toxicity responses using in vitro Tox21 bioactivity
Role: Principal Investigator (PI)

Select Prior Contract Support:

- American Beverage Association (ABA) (Borghoff/**Rager**) 01/01/2017-12/31/2017
Total Amount: \$140,000
Elucidating mode of action underlying 4-methylimidazole-induced lung cancer
Role: Co-Principal Investigator
- American Chemistry Council (Thompson/**Rager**) 01/01/2016–12/31/2019
Total Amount: \$300,000
Assess high-throughput screening data and transcriptomic responses to hexavalent chromium in dose-response and risk assessment applications
Role: Co-Principal Investigator
- American Petroleum Institute (API) (Thompson/**Rager**) 06/01/2015–12/31/2019
Total Amount: \$60,000
Evaluating the applicability of computational toxicology models for oil and gas substances (UVCBs)
Role: Co-Principal Investigator

Summary of Graduate Advising/Mentoring

Current Primary Research Advisor Positions

Current ESE Postdoctoral Student Supervision-Primary Advisor (1 Post-doc):

1. **Elise Hickman (Post-doc)** 2022-present
Primary advisor. Department: Environmental Sciences and Engineering, Gillings School of Global Public Health, North Carolina, UNC.

Current ESE Graduate Student Supervision-Primary Advisor (2 Ph.D):

1. **Allison Spring (Ph.D)** 2024-present
Primary advisor. Department: Environmental Sciences and Engineering, Gillings School of Global Public Health, North Carolina, UNC.
2. **Lauren Koval (Ph.D)** 2020-present
Primary advisor. Department: Environmental Sciences and Engineering, Gillings School of Global Public Health, North Carolina, UNC.

Current CiTEM Graduate Student Supervision-Primary Advisor (2 Ph.D):

1. **Chloe Chou (Ph.D)** 2024-present
Primary advisor. Department: Curriculum in Toxicology and Environmental Medicine, School of Medicine, North Carolina, UNC.
2. **Sarah Miller (Ph.D)** 2023-present
Primary advisor. Department: Curriculum in Toxicology and Environmental Medicine, School of Medicine, North Carolina, UNC.

Current ESE BSPH's Undergraduate Student Supervision-Primary Research Advisor (4 B.S.P.H):

1. **Victoria Carberry (B.S.P.H)** 2023-present
Primary advisor. Environmental Sciences and Engineering, Gillings School of Global Public Health, North Carolina, UNC.
2. **Kai Malone (B.S.P.H)** 2023-present
Primary advisor. Department: Environmental Sciences and Engineering, Gillings School of Global Public Health, North Carolina, UNC.
3. **Lauren Simendinger (B.S.P.H)** 2023-present
Primary advisor. Department: Environmental Sciences and Engineering, Gillings School of Global Public Health, North Carolina, UNC.
4. **Raquel Winker (B.S.P.H)** 2022-present
Primary advisor. Department: Environmental Sciences and Engineering, Gillings School of Global Public Health, North Carolina, UNC.

Current Academic Faculty Mentor Positions

Current ESE Undergraduate Student Supervision-Mentor (3 B.S.P.H):

1. Claire Howard (B.S.P.H) 2023-present
2. Molade Otusheso (B.S.P.H) 2023-present

3. Raquel Winker (B.S.P.H)

2023-present

Current Committee Member Positions (in addition to primary advisor listed above)

Current ESE Graduate Student Supervision-Committee Member (12 Ph.D, 0 MSPH):

1. **Jenna Frey (Ph.D)** 2024-current
Member of supervisory committee. Environmental Sciences and Engineering, Gillings School of Global Public Health, North Carolina, UNC. Advisor: Rebecca Fry.
2. **Kristina Stuckey (Ph.D)** 2024-current
Member of supervisory committee. Environmental Sciences and Engineering, Gillings School of Global Public Health, North Carolina, UNC. Advisor: Rebecca Fry.
3. **Arjun Keshava (Ph.D)** 2023-present
Member of supervisory committee. Department: Environmental Sciences and Engineering, Gillings School of Global Public Health, North Carolina, UNC. Advisor: Rebecca Fry.
4. **Amaree Gardner (Ph.D)** 2023-present
Member of supervisory committee. Department: Environmental Sciences and Engineering, Gillings School of Global Public Health, North Carolina, UNC. Advisor: Rebecca Fry.
5. **Devin Alewel (Ph.D)** 2023-present
Member of supervisory committee. Department: Environmental Sciences and Engineering, Gillings School of Global Public Health, North Carolina, UNC. Research Advisor: Urmila Kodavanti. Academic Advisor: Rebecca Fry.
6. **Haley Macdonald (Ph.D)** 2023-present
Member of supervisory committee. Department: Environmental Sciences and Engineering, Gillings School of Global Public Health, North Carolina, UNC. Advisor: Orlando Coronell.
7. **Yifei Yang (Ph.D)** 2023-present
Member of supervisory committee. Department: Environmental Sciences and Engineering, Gillings School of Global Public Health, North Carolina, UNC. Advisor: Kun Lu.
8. **Eric Brown (Ph.D)** 2022-present
Member of supervisory committee. Department: Environmental Sciences and Engineering, Gillings School of Global Public Health, North Carolina, UNC. Advisor: Rebecca Fry.
9. **Anastasia Freedman (Ph.D)** 2021-present
Member of supervisory committee. Department: Environmental Sciences and Engineering, Gillings School of Global Public Health, North Carolina, UNC. Advisor: Rebecca Fry.
10. **Kennedy Holt (Ph.D)** 2019-present
Member of supervisory committee. Department: Environmental Sciences and Engineering, Gillings School of Global Public Health, North Carolina, UNC. Advisor: Jackie MacDonald Gibson.
11. **Yunjia Lai (Ph.D)** 2019-present
Member of supervisory committee. Department: Environmental Sciences and Engineering, Gillings School of Global Public Health, North Carolina, UNC. Advisor: Kun Lu.
12. **Risa Sayre (Ph.D)** 2018-present
Member of supervisory committee. Department: Environmental Sciences and Engineering, Gillings School of Global Public Health, North Carolina, UNC. Advisors: John Wambaugh and Marc Serre.

Current ESE Undergraduate Student Supervision-Committee Member (1 B.S.P.H):

1. **Emery Hoos (B.S.P.H)** 2023-present
Chair and member supervisory committee. Department: Environmental Sciences and Engineering, Gillings School of Global Public Health, North Carolina, UNC. Advisor: Rebecca Fry. Title: *Epigenetic mechanisms*

underlying endometrial cancer (EC) outcomes: race-specific patterns of DNA methylation associated with molecular subtypes and EC survival.

Current CiTEM Graduate Student Supervision-Committee Member (8 Ph.D):

1. **Charlotte Love (Ph.D)** 2023-present
Chair and member supervisory committee. Department: Curriculum in Toxicology and Environmental Medicine, School of Medicine, North Carolina, UNC. Advisor: Ilona Jaspers. Title: *Vaping induced oxidation products of CBD and delta8-THC and their effects on the respiratory epithelium.*
2. **Aleah Bailey (Ph.D)** 2023-present
Chair and member supervisory committee. Department: Curriculum in Toxicology and Environmental Medicine, School of Medicine, North Carolina, UNC. Advisor: Ilona Jaspers. Title: *Using novel methods to evaluate the effects of allostatic load on responses to air pollutants.*
3. **Catalina Cobos-Uribe (Ph.D).** 2022-present
Member supervisory committee. Department: Curriculum in Toxicology and Environmental Medicine, School of Medicine, North Carolina, UNC. Advisor: Meghan Rebuli. Title: *The Respiratory Microbiome and the Host Response to Wood Smoke Exposure.*
4. **Morgan Nalesnik (Ph.D)** 2022-present
Member supervisory committee. Department: Curriculum in Toxicology and Environmental Medicine, School of Medicine, North Carolina, UNC. Advisor: Meghan Rebuli and Neil Alexis. Title: *Phenotyping inflammatory responders and non-responders to inhaled pollutants.*
5. **Stephanie Brocke (Ph.D)** 2022-present
Chair and member of supervisory committee. Department: Curriculum in Toxicology and Environmental Medicine, School of Medicine, North Carolina, UNC. Advisor: Ilona Jaspers. Title: *Air Pollution Particles and Viral Infection in Nasal Epithelial Cells.*
6. **Morgan Narain (Ph.D)** 2022-present
Member of supervisory committee. Department: Curriculum in Toxicology and Environmental Medicine, School of Medicine, North Carolina, UNC. Advisor: Cavin Ward-Caviness. Title: *Modifier of PM2.5 Associated Health Risks in Susceptible Populations.*
7. **Katelyn Huff (Ph.D)** 2021-present
Chair and member of supervisory committee. Department: Curriculum in Toxicology and Environmental Medicine, School of Medicine, North Carolina, UNC. Advisor: Rebecca Fry.
8. **Keith Rogers (Ph.D)** 2021-present
Member of supervisory committee. Department: Curriculum in Toxicology and Environmental Medicine, School of Medicine, North Carolina, UNC. Advisor: Ilona Jaspers. Title: *Emissions from plastic incineration induce toxicity in human respiratory epithelial cells.*

Current Chemistry Department Graduate Student Supervision-Committee Member (1 Ph.D):

1. **Taylor Teitelbaum (Ph.D.)** 2023-present
Member and Committee Chair of supervisory committee. Department: Chemistry, College of Arts and Sciences, North Carolina, UNC. Advisor: Kun Lu.

Former Primary Advisor Positions

Former ESE PhD Graduate Student Supervision-Primary Advisor (1 Ph.D):

1. **Celeste Carberry (Ph.D.)** 2020-2024
Primary advisor. Department: Environmental Sciences and Engineering, Gillings School of Global Public Health, North Carolina, UNC. Dissertation title: *Per and Polyfluoroalkyl Substances and Emerging Toxicity Mechanisms: Alterations in Liver-Derived Extracellular Vesicle Content, Regulation, and Function.*

Former ESE Master's Graduate Student Supervision-Primary Advisor (2 M.S. / M.S.P.H.):

1. **Elena McDermott (M.S.P.H)** 2021-2023
Primary advisor. Department: Environmental Sciences and Engineering, Gillings School of Global Public Health, North Carolina, UNC. Thesis title: *Biomass smoke mixtures indicative of wildland vs. wildland urban interface exposures induce changes in Hypoxia Inducible Factor 1-alpha (HIF1a) responses in lung cells.*
2. **Alexis Payton (M.S)** 2020-2021
Primary advisor. Department: Environmental Sciences and Engineering, Gillings School of Global Public Health, North Carolina, UNC. Thesis title: *Multi-region comparison of immune mediators from human respiratory tract samples: baseline signatures, eigenvector analyses, and tobacco product effects.*
Position after graduation: Data analyst for UNC CEMALB and Rockette dancer

Former ESE Undergraduate Honors Student Supervision-Primary Advisor (3 B.S.P.H):

1. **Toby Turla (B.S.P.H)** 2021-2022
Primary advisor. Department: Environmental Sciences and Engineering, Gillings School of Global Public Health, North Carolina, UNC. Thesis title: *Chemical mixtures in household environments: in silico predictions and in vitro testing of potential joint toxicities in human liver cells.*
Position after graduation: MHS Candidate, Johns Hopkins Bloomberg School of Public Health
Current position: Health Equity Fellow, National Center for Immunization and Respiratory Diseases, CDC
2. **Alexis Payton (B.S.P.H)** 2019-2020
Primary advisor. Department: Environmental Sciences and Engineering, Gillings School of Global Public Health, North Carolina, UNC. Thesis title: *Placental genomic and epigenomic signatures regulating infant birth weight highlight mechanisms involved in collagen and growth hormone signaling.*
Position after graduation: UNC M.S. Student
Current position: Data analyst for UNC CEMALB and Rockette dancer
3. **Celeste Carberry (B.S.P.H)** 2018-2020
Primary advisor. Department: Environmental Sciences and Engineering, Gillings School of Global Public Health, North Carolina, UNC. Thesis title: *Non-targeted analysis of placentas from preeclamptic patients identifies links to acetaminophen and molecular alterations relevant to cell death.*
Position after graduation: UNC Ph.D. Student

Former Committee Member Positions

Former ESE Doctoral Graduate Student Supervision-Committee Member (4 Ph.D):

1. **Yun-Chung Hsiao (Ph.D)** 2021-2023
Member of supervisory committee. Department: Environmental Sciences and Engineering, Gillings School of Global Public Health, North Carolina, UNC. Advisor: Kun Lu. Dissertation title: *Exploration on Bioinformatic and Metabolic Modulation by the Gut Microbiome.*
2. **Jeliah Clark (Ph.D)** 2018-2022
Member of supervisory committee. Department: Environmental Sciences and Engineering, Gillings School of Global Public Health, North Carolina, UNC. Advisor: Rebecca Fry. Dissertation title: *Nutritional modulation of fetal susceptibility to lower birth weight associated with prenatal inorganic arsenic exposure.*

3. **Lauren Eaves (Ph.D)** 2019-2022
Member of supervisory committee. Department: Environmental Sciences and Engineering, Gillings School of Global Public Health, North Carolina, UNC. Advisor: Rebecca Fry. Dissertation title: *Metal mixtures and preterm birth: private well water exposure and the role of the placenta.*
4. **Liang Chi (Ph.D)** 2019-2020
Member of supervisory committee. Department: Environmental Sciences and Engineering, Gillings School of Global Public Health, North Carolina, UNC. Advisor: Kun Lu. Dissertation title: *The functional interactions of arsenic exposure, gut microbiota, and host.*

Former ESE Master's Graduate Student Supervision-Committee Member (3 M.S.P.H):

1. **Jingya Peng (M.S.P.H.)** 2023-2024
Member of supervisory committee. Department: Environmental Sciences and Engineering, Gillings School of Global Public Health, North Carolina, UNC. Advisor: Kun Lu. Thesis title: *The effect of black raspberry on glucose intolerance in early-life exposure to inorganic arsenic in mice.*
3. **Kristina Stuckey (M.S.P.H)** 2022-2023
Member of supervisory committee. Department: Environmental Sciences and Engineering, Gillings School of Global Public Health, North Carolina, UNC. Advisor: Rebecca Fry. Thesis title: *Analyzing sex-specific associations of toxic and essential metals and neurocognitive outcomes in ELGANs.*
4. **Caroline Reed (M.S.P.H)** 2018-2019
Member of supervisory committee. Department: Environmental Sciences and Engineering, Gillings School of Global Public Health, North Carolina, UNC. Advisor: Rebecca Fry. Thesis title: *Metals accumulation in the placenta and fetal membrane: preterm birth risk in a North Carolina cohort.*

Former ESE Undergraduate Student Supervision-Committee Member (5 B.S.P.H):

1. **Hannah Matthews (B.S.P.H)** 2022-2023
Member of supervisory committee. Department: Environmental Sciences and Engineering, Gillings School of Global Public Health, North Carolina, UNC. Advisor: Rebecca Fry. Thesis title: *Systems biology approach to PFAS exposures and pregnancy-induced hypertensive outcomes.*
2. **Louisa Boateng (B.S.P.H)** 2022-2023
Member of supervisory committee. Department: Environmental Sciences and Engineering, Gillings School of Global Public Health, North Carolina, UNC. Advisor: Rebecca Fry. Thesis title: *Examining the effects of inorganic arsenic on chromatin accessibility and genomic response in placental cells using ATAC-sequencing and RNA-sequencing.*
3. **Noemi Gavino-Lopez (B.S.P.H)** 2022-2023
Member of supervisory committee. Department: Environmental Sciences and Engineering, Gillings School of Global Public Health, North Carolina, UNC. Advisor: Rebecca Fry. Thesis title: *Developing toxic metal environmental justice indices (TM-EJI) for arsenic, cadmium, lead, and manganese contamination in private drinking wells in North Carolina.*
4. **Vennela Avula (B.S.P.H)** 2020-2021
Member of supervisory committee. Department: Environmental Sciences and Engineering, Gillings School of Global Public Health, North Carolina, UNC. Advisor: Rebecca Fry. Thesis title: *Effects of Inorganic Arsenic on the Epithelial-Mesenchymal Transition, Migration and Invasion of Placental Cells.*
5. **Kirsi Oldenburg (B.S.P.H)** 2019-2020
Member of supervisory committee. Department: Environmental Sciences and Engineering, Gillings School of Global Public Health, North Carolina, UNC. Advisor: Rebecca Fry. Thesis title: *The evaluation of placental inflammation via the genomic inflammatory index (GII) in relation to key perinatal factors.*

Former CiTEM Post-Doctoral Student Supervision-Committee Member (1 Post-doc):

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|---|-----------|
| 1. Alysha Simmons (Post-doc) | 2021-2023 |
| Member of supervisory committee. Department: Curriculum in Toxicology and Environmental Medicine, School of Medicine, North Carolina, UNC. Advisor: Shaun McCollough. Title: <i>Evaluating inter-individual variability in response to ozone using a bronchial co-culture model</i> | |

Former Academic Mentor Positions

Former ESE Graduate Student Supervision-Mentor (3 M.P.H):

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|----------------------------|-----------|
| 1. Sarah Combs (M.P.H) | 2023-2023 |
| 2. Madeleine Green (M.P.H) | 2021-2023 |
| 3. Sydnie Toler (M.P.H) | 2020-2022 |

Former ESE Undergraduate Student Supervision-Mentor (5 B.S.P.H):

- | | |
|--------------------------------|-----------|
| 1. Alexander Acosta (B.S.P.H) | 2020-2023 |
| 2. Kathryn Banks (B.S.P.H) | 2020-2023 |
| 3. Ashleigh Henry (B.S.P.H) | 2020-2023 |
| 4. Jarvis Richardson (B.S.P.H) | 2020-2023 |
| 5. Vennela Avula (B.S.P.H) | 2020-2021 |

Other Mentoring Activities

Junior Faculty

- | | |
|---|-----------|
| 1. Sadjad Fakouri Baygi (Research Associate, Icahn School of Medicine) | 2022-2023 |
| Faculty mentor on through the Career MODE program (Careers through Mentoring and training in Omics and Data for Early-stage investigators). | |
| 2. Tiziana Corsello (Assistant Professor, University of Texas Medical Branch) | 2020-2022 |
| Faculty mentor on through the Career MODE program (Careers through Mentoring and training in Omics and Data for Early-stage investigators). | |

Visiting Scholar (1 Ph.D):

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|--|------|
| 1. Yvonne Chang (Ph.D) | 2019 |
| Mentor on the SOT Colgate-Palmolive Fellowship Award to support funds to travel and train in my laboratory. Advisor: Susan Tilton (Oregon State University). | |

Internship Supervision-Primary Mentor (1 Intern):

- | | |
|--|------|
| 1. William Klaren (Ph.D.) | 2017 |
| Primary mentor. Company: ToxStrategies, Inc. Austin, TX.
Next position: Toxicologist at SC Johnson. | |

Professional Development

Trained Graduate Student Mentor Certification

Spring 2019

Received formal mentoring training by completing the UNC Graduate School Effective Faculty Mentoring Training Program

Professional Service

To Discipline:

Mentor within Formal Mentorship Programs:

- Mentor for Columbia University's R21 Careers through Mentoring and Training in Omics and Data for Early-Stage Investigations (Career MODE Program, PIs Andrea Baccarelli and Gary Miller) 2022-present
- SOT Graduate Student Training Mentor for Multiple Specialty Sections 2016-present
Including the Biological Modeling SS, Women in Toxicology, and Risk Assessment SS

Grant Review Panels:

- NIH Environmental Influences on Child Health Outcomes (ECHO) Opportunities and Infrastructure Fund (OIF) Award Cycle 4 and 5 2021
- US EPA (US Environmental Protection Agency) RFA EPA-G2018-STAR-C1 2018
Advancing Actionable Alternatives to Vertebrate Animal Testing for Chemical Safety Assessment

Chair of Professional Panels / Committees

- Co-Chair of the U.S. EPA Value of Information (VOI) Panel on Integrating -Omics Data into Chemical Safety Evaluations through the EPA Transcriptomics Assessment Products (ETAP) 2023

Member of Professional Panels / Committees:

- 18th International Congress on Combustion Byproducts and Health Organizing Committee 2024
- International advisory board member for ToxicR dose response for risk assessment 2022-present
- HESI eSTAR Point of Department (POD) Working Group 2020-present
- NIH National Superfund Research Program Annual Meeting Programming Committee 2020-2022
- EMGS/ICEM Computational Toxicology and Bioinformatics Programming Committee 2019-2021
- NIH/HESI Botanical Safety Consortium 2019-present
- SOT Developing Member Leadership & Communication Skill Task Force 2019-2020
- HESI eSTAR Carcinogenomics Committee 2018-present
- Society of Toxicology (SOT) Continuing Education Committee 2018-2020
- Toxicology Forum (ToxForum) Programming Committee 2017-2018

Journal Associate Editor:

- Journal of Exposure Science & Environmental Epidemiology 2021-present

Journal Specialty Section Editor

- Current Environmental Health Reports Specialty Section on Toxicity Mechanisms. Co-Edited by Wiehsueh Chu and Julia Rager 2023
- Journal of Exposure Science & Environmental Epidemiology, Exposure Forecasting Specialty Issue on a Decade of ExpoCast Initiatives. Co-Edited by John Wambaugh and Julia Rager 2022

Journal Editorial Board Member:

- Toxicological Sciences 2020-present
- Frontiers in Toxicology: Computational Toxicology and Informatics 2019-present
- Frontiers in Big Data: Medicine and Public Health 2018-present

Journal Invited Reviewer:

- Current Environmental Health Reports 2023-present
- Computational Toxicology 2021-present
- Regulatory Toxicology and Pharmacology 2021-present
- Scientific Reports 2021-present
- Biomarkers 2019-present
- Current Opinion in Toxicology 2019-present
- Regulatory Toxicology and Pharmacology 2019-present
- BioData Mining 2018-present
- Environmental Health Perspectives 2018-present
- Environment International 2018-present
- Environmental Science and Technology 2018-present
- Epigenetics 2018-present
- Frontiers in Big Data: Medicine and Public Health 2018-present
- Toxicological Sciences 2018-present
- Toxicology Research 2017-present
- Food and Chemical Toxicology 2016-present
- Science of the Total Environment 2016-present
- American Journal of Respiratory Cell and Molecular Biology 2014-present
- Future Medicine 2014-present
- Genomics, Proteomics, & Bioinformatics 2012-present

Member/Leadership Roles within Scientific Societies:

- Data Integration Team for HESI Botanicals Working Group 2022-present
- Councilor, NC SOT 2020-2022
- Continuing Education Committee, SOT 2018-2021
- Member of the HESI Molecular Point of Departure Working Group 2018-present
- Data Compilation Team for HESI eSTAR Carcinogenomics Committee 2018-2020
- Senior Councilor, SOT Mixtures Specialty Section 2017-2018
- Junior Councilor, SOT Mixtures Specialty Section 2016-2017
- Postdoctoral Representative, SOT Mixtures Specialty Section 2015-2016
- Student Representative, SOT Mixtures Specialty Section 2012-2014
- Graduate Student Leadership Committee, SOT 2012-2014

Internal Service to the UNC Department of Environmental Sciences and Engineering (ESE)

1. *ESE Committee to Set Clear Expectations for PhD Milestones* 2024-present
2. *ESE Strategic Planning and Action Task Force (SPLAT)* 2023-present
Optimize and deliver solutions to Departmental tasks and obligations
3. *ESE Faculty Retreat Planning Committee* 2023
Contributed to the planning of the annual faculty retreat for ESE
4. *Research PI Lead, IEHS Equity and Environmental Justice (QUEST) Program* 2021-present
Lead and participate in activities for the IEHS QUEST summer research program for undergraduates
5. *Conference Planning Committee, UNC Superfund Research Center* 2021-2022
Lead the planning of multiple sessions and overall logistics of the National Annual Superfund Research Center Conference, co-lead between UNC and NCSU's Superfund Research Programs
6. *Graduate Student Recruitment Presenter for Health Team* 2020-present
Serve as the health lead for presenting information on ESE research to student candidates and admitted students

(4 events per year)

7. *Centennial Celebration Planning Committee* 2018-2022
Serve as a member of the ESE centennial celebration planning committee
8. *Leader and Member of the Institute for Environmental Health Solutions (IEHS)* 2018-present
Serve as the current lead of the data management and analysis core and member of the IEHS

Internal Service to the UNC Gillings School of Global Public Health (SPH)

1. *Reviewer, UNC Gillings Innovation Lab (GIL)* 2023-present
Serve as a grant reviewer for the UNC Gillings Innovation Lab (GIL) Program. Cycles of review: Round 8: Harnessing AI in Public Health (Fall 2023).
2. *Reviewer, UNC Center for Environmental Health and Susceptibility (CEHS)* 2023-present
Serve as a grant reviewer for the CEHS pilot grant program on an ad hoc basis. Cycles of review: Fall 2023
3. *Reviewer, Gillings Study Section* 2023-present
Serve as a grant reviewer for principal investigators within the SPH to receive critical feedback regarding grant submissions. Cycles of review: Spring 2023
4. *Reviewer, the MPH Comprehensive Exam* 2021-present
Serve as an organizer and reviewer of first year Masters of Public Health (MPH) students during their Fall and Spring oral comprehensive exams
5. *Reviewer, The University Cancer Research Fund* 2021-present
Serve as the ESE delegate to review doctoral students awards for the School of Public Health's Cancer Research Fund every Spring semester

Internal Service to the Larger UNC Community

1. *Member, CiTEM Postdoc Advisory Committee* 2024-present
Serve on the interview and advisory committee for post-doctoral trainees in the CiTEM program.
2. *Member, Center for Environmental Medicine, Asthma and Lung Biology (CEMALB)* 2021-present
Serve as an active member of the CEMALB, contributing to data management analysis infrastructure and mentorship of CEMALB affiliated students.
3. *Leader, CiTEM Written Exam Committee* 2020-present
Serve as an active leader of the CiTEM written exam committee.
4. *Member, Biological & Biomedical Sciences Program (BBSP)* 2020-present
Serve as an active member of the BBSP and its associated Curriculum in Toxicology (CiTEM), and mentor BBSP rotation students during their early graduate school years.
5. *Member, Graduate Faculty* 2018-present
Serve as a member of the UNC graduate faculty to mentor and serve on UNC undergraduate and graduate research committees.