

JESSICA H. HARTMAN, PH.D.

Nicholas School of the Environment
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EDUCATION

University of Arkansas at Little Rock (2012)

Department: *Chemistry*
Major: Chemistry (Physics Minor)
Degree Conferred: B.S.

University of Arkansas for Medical Sciences (2012-2016)

School: Graduate School
Department: *Biochemistry*
Degree Conferred: Ph.D.

HISTORY

2012-2016 University of Arkansas for Medical Sciences
Funded by NSF Graduate Research Fellowship

Graduate Research Assistant
Biochemistry and Molecular Biology
Advisor: Grover P. Miller, Ph.D.

2016-2020 Duke University
Funded by NIH NRSA F32 Postdoctoral Fellowship
and NIH K99 Transition to Independence Award

Postdoctoral Fellow
Nicholas School of the Environment
Advisor: Joel N. Meyer, Ph.D.

2017-present National Institutes of Health
Guest position granted in collaborator's lab

Guest Researcher
National Institute on Drug Abuse
Lab: Brandon K. Harvey, Ph.D.

Oct 2020- Medical University of South Carolina
Funded by NIH ROO Transition to Independence Award

Tenure-Track Assistant Professor
Biochemistry and Molecular Biology
Starting October 1, 2020

RESEARCH INTERESTS AND ACTIVITIES

- Toxicological consequences xenobiotic metabolism by human mitochondrial cytochrome P450 2E1 and its endogenous role in fatty acid/ketone metabolism in health and disease (biochemistry).
- Physical exercise as a modifier of exposure risk to environmental contaminants (exercise physiology).
- The role of the neurotrophic factor MANF in modulating toxicity from exposure to toxicants (neurotoxicity).

EXTRAMURAL RESEARCH SUPPORT (IN PROGRESS AND COMPLETED)

08/2014 – 05/2016 DGE 1452779, NSF Graduate Research Fellowship (Fellow, 100% effort)
National Science Foundation

08/2016 – 07/2019 1F32 ES027306, National Research Service Award (PI, 100% effort)
Role of mitochondrial CYP2E1 in chemical exposure-driven neurodegeneration
National Institute of Environmental Health Sciences
Total Costs: \$170,802

09/2019 – 08/2024 1K99 ES029552-01A1, NIH Pathway to Independence Award (PI)
Exercise, MANF, and chemical-induced neurodegeneration
National Institute of Environmental Health Sciences

SELECTED AWARDS AND HONORS

2013 Student Research Week Bhuvan Award Recipient (Univ. of Arkansas for Medical Sciences)
2013 Travel Award for 10th International ISSX Meeting (Univ. of Arkansas for Medical Sciences)

- 2014 1st Place in Graduate Oral Presentations at the Arkansas Academy of Science Meeting
- 2014 PhRMA Foundation Predoctoral Fellowship in Informatics (Alternate)
- 2014 National Science Foundation Graduate Student Research Fellowship
*Only 2,000 of >14,000 applicants were awarded the prestigious 3-year NSF GRFP fellowship
- 2014 Student Research Week Bhuvan Award Recipient (Univ. of Arkansas for Medical Sciences)
- 2014 ACS Chemical Toxicology Student Travel Award to attend the 248th National Meeting
- 2014 ISSX Student Travel Award to attend the 19th North American ISSX Meeting
- 2015 Excellence Award for Oral Presentation (Runner-up, Junior Division) – IBS Symposium, UAMS
- 2016 Excellence Award for Oral Presentation (First place, Senior Division) – IBS Symposium, UAMS
- 2016 Dean's Distinguished Scholar Award (University of Arkansas for Medical Sciences)
- 2016 Alan D. Elbein Award for Research Excellence (University of Arkansas for Medical Sciences)
- 2017 First Place Postdoc Poster, North Carolina Society of Toxicology Meeting (Durham, NC)
- 2018 First Place Gabriel Plaa Education Award, Mechanisms SS, SOT Meeting (San Antonio, TX)
- 2018 Best Platform Presentation, GEMS Fall Meeting (Durham, NC)
- 2019 Postdoctoral Research Award, Molecular and Systems Biology SS, SOT Meeting (Baltimore, MD)

PUBLICATIONS

1. Laranjeiro R, Harinath G, Hewitt JE, **Hartman JH**, Royal MA, Meyer JN, Vanapalli SA, Driscoll M (2019) "Swim exercise in *C. elegans* extends neuromuscular and gut healthspan, enhances learning ability, and protects against neurodegeneration" *Proceedings of the National Academy of Sciences*, 116(47): 23829-23839.
2. Smith LL, Ryde IT, **Hartman JH**, Romersi RF, Markovich Z, Meyer JN (2019) "Strengths and limitations of morphological and behavioral analyses in detecting dopaminergic deficiency in *Caenorhabditis elegans*" *Neurotoxicology*, 74:209-220.
3. **Hartman JH**^{*}, Gonzalez-Hunt C^{*}, Ryde I, Hall SM, Caldwell GA, Caldwell KA, Meyer JN (2019) "Genetic defects in mitochondrial dynamics in *Caenorhabditis elegans* impact UV- and toxicant-induced neurodegeneration," *International Journal of Molecular Sciences*, 20(13).
4. Bachman H, Fu H, Huang PH, Tian Z, Embry-Seckler J, Rufo J, Xie Z, **Hartman JH**, Zhao S, Yang S, Meyer JN, Huang TJ (2019) "Open Source Acoustofluidics" *Lab on a Chip*, 19(14): 2404-2414.
5. **Hartman JH**, Richie CT, Mello DF, Castillo P, Zhu A, Wang Y, Hoffer BJ, Meyer JN, Harvey BK (2019) "MANF deletion abrogates *Caenorhabditis elegans* larval response to tunicamycin and *Pseudomonas aeruginosa*" *European Journal of Cell Biology*, 98(5-8). Pii: S0171-9334(18)30348-0.
6. Zhang J, Yang S, Chen C, **Hartman JH**, Huang PH, Wang L, Tian Z, Zhang P, Faulkenberry D, Meyer JN, Huang TJ (2019) *Lab on a Chip*, 19(6): 984-992.
7. Cothren SD, Meyer JN, **Hartman JH** (2018) "Blinded visual scoring of images using the freely-available software Blender." *Bio-protocol*, 8(23) pii: e3103.
8. Pouncey D, **Hartman JH**, Moore PC, Dillinger DJ, Dickerson KW, Sappington DR, Smith ES, Boysen G, Miller GP (2018) "Novel isomeric metabolite profiles correlate with warfarin metabolism phenotype during maintenance dosing in a pilot study of 29 patients." *Blood Coagulation & Fibrinolysis*, 29(7): 602-612.
9. **Hartman JH**, Smith LL, Gordon KL, Laranjeiro R, Driscoll M, Sherwood DR, Meyer JN (2018) "Swimming exercise and transient food deprivation in *Caenorhabditis elegans* promote mitochondrial maintenance and protect against chemical-induced mitotoxicity" *Scientific Reports* 8(1):8359.
10. Meyer JN, **Hartman JH**, Mello DF (2018) "Mitochondrial Toxicity" *Toxicological Sciences* 162(1):15-23.
11. Hartman JH, Kozal JS, Di Giulio RT, Meyer JN (2017) "Zebrafish have an ethanol-inducible hepatic 4-nitrophenol hydroxylase that is not CYP2E1-like." *Environmental Toxicology and Pharmacology* 54: 142-145.
12. **Hartman JH**, Miller GP, Caro AA, Byrum SD, Orr LM, Mackintosh SG, Tackett AJ, MacMillan-Crow LA, Hallberg LM, Ameredes BT, Boysen G (2017) "1,3-Butadiene-induced mitochondrial dysfunction is correlated with mitochondrial CYP2E1 activity in Collaborative Cross mice." *Toxicology* 378: 114-124.
13. **Hartman JH**, Miller GP, Meyer JN. (2017) "Toxicological Implications of Mitochondrial Localization of CYP2E1." *Toxicological Research* 6(3): 273-289.
14. Bostian AC, Maddukuri L, Reed MR, Savenka T, **Hartman JH**, Davis L, Pouncey DL, Miller GP, Eoff RL (2016) "Kynurenine Signaling Increases DNA Polymerase Kappa Expression and Promotes Genomic Instability in Glioblastoma Cells." *Chemical Research in Toxicology* 29(1):101-8.
15. **Hartman JH**, Martin HC, Caro AA, Pearce AR, Miller GP (2015) "Subcellular Localization of Rat CYP2E1 Impacts Metabolic Efficiency toward Common Substrates" *Toxicology* 338: 47-58.

16. **Hartman JH**, Letzig LG, Roberts D, James LP, Miller GP (2015) "Cooperativity in CYP2E1 Metabolism of Acetaminophen and Styrene Mixtures" *Biochemical Pharmacology* 97(3):341-9.
17. Levy JW, **Hartman JH**, Perry MD Jr, Miller GP (2015) "Structural basis for cooperative binding of azoles to CYP2E1 as interpreted through guided molecular dynamics simulations." *Journal of Molecular Graphics and Modeling* 56:43-52.
18. Pugh CP, Pouncey DL, **Hartman JH**, Nshimiyimana R, Desrochers LP, Goodwin TE, Miller GP (2014) "Glucuronidation of R- and S-7-Hydroxywarfarin by Multiple UDP- Glucuronosyltransferases in Human Liver Microsomes Yields Two Metabolites." *Archives of Biochemistry and Biophysics* 564:244-53.
19. **Hartman JH**, Miller GP, Boysen G (2014) "Inhibitory potency of 4-carbon alkanes and alkenes toward CYP2E1 activity." *Toxicology*, 318:51-8.
20. **Hartman JH**, Knott AK, Miller GP (2014) "CYP2E1 Hydroxylation of Aniline Involves Negative Cooperativity," *Biochemical Pharmacology*, 87(3):523-33.
21. Pianalto K, **Hartman JH**, Boysen G, Miller GP (2013) "No difference in Butadiene Metabolite Inhibition of CYP2E1 Activity between Rats and Mice," *Toxicology Letters*, 223(2):221-7.
22. **Hartman JH**, Burch AM, Laddusaw RM, Perry Jr MD, Miller GP (2013) "Structure of Pyrazole Derivatives Impact their Affinity, Stoichiometry, and Cooperative Interactions for CYP2E1 Complexes," *Archives of Biochemistry and Biophysics*, 537(1):12-20.
23. **Hartman JH**, Cothren SD, Park SH, Yun CH, Darsey JA, Miller GP (2013) "Predicting CYP2C19 Catalytic Parameters for Enantioselective Oxidations Using Artificial Neural Networks and a Chirality Code," *Bioorganic and Medicinal Chemistry* 21(13):3749-59.
24. Coggins GE, Maddukuri L, Penthala NR, **Hartman JH**, Eddy S, Ketkar A, Crooks PA, Eoff RL (2013) "N-Aroyl Indole Thiobarbituric Acids as Inhibitors of DNA Repair and Replication Stress Response Polymerases," *ACS Chemical Biology* 8(8):1722-9.
25. **Hartman JH**, Boysen G, Miller GP (2013) "Cooperative Effects for CYP2E1 Differ between Styrene and its Metabolites," *Xenobiotica* 43(9):755-64.
26. Kim SY, Kang JY, **Hartman JH**, Park SH, Jones DR, Yun CH, Boysen G, Miller GP. (2012) "CYP2E1 Metabolism of R- and S-warfarin by CYP2C19 into four hydroxywarfarins." *Drug Metabolism Letters* 6(3):157-64.
27. **Hartman JH**, Boysen G, Miller GP (2012) "CYP2E1 Metabolism of Styrene Involves Allostery," *Drug Metabolism and Disposition* 40(10):1976-1983.

SELECTED PRESENTATIONS

PLATFORM

1. *Genetics and Environmental Mutagenesis Society Fall Meeting, Durham, NC*: "Long-Term Swimming Exercise in *C. elegans* Improves Mitochondrial Health and Protects Animals from Age- and Toxicant-Induced Degeneration," November 2018
2. *GSA 21st International C. elegans Conference, Los Angeles, CA*: "Exercise in *Caenorhabditis elegans* promotes mitochondrial maintenance and protects against chemical-induced mitotoxicity," June 2017
3. *100th Annual Arkansas Academy of Science Meeting, Fayetteville, AR*: "Mitochondrial CYP2E1 drives butadiene-induced mitochondrial dysfunction," April 2016
4. *248th American Chemical Society National Meeting, San Francisco, CA*: "CYP2E1 Cooperativity Impacts Bioactivation of Mixtures of Styrene and Acetaminophen," August 2014
5. *98th Annual Arkansas Academy of Science Meeting, Searcy, AR*: "Acetaminophen Increases Styrene Bioactivation to a Toxic Metabolite by CYP2E1," April 2014
6. *Mid-South Inorganic Chemists Association Meeting, Little Rock, AR*: "Predicting Human Liver Metabolic Pathways for Chiral Compounds," October 2013
7. *97th Annual Arkansas Academy of Science Meeting, Little Rock, AR*: "Structure of Pyrazole Derivatives Impact their Affinity, Stoichiometry, and Cooperative Interactions for CYP2E1 Complexes," April 2013

POSTER

1. *GSA 22nd International C. elegans Conferences, Los Angeles, CA*: "Swim exercise in *Caenorhabditis elegans* protects dopaminergic neurons from age- and rotenone-induced degeneration," June 2019.
2. *57th Annual Society of Toxicology Meeting, Baltimore, MD*: "Long-term swimming exercise in *Caenorhabditis elegans* improves mitochondrial health and protects animals from age- and toxicant-induced degeneration," March 2019.

3. *Integrative Physiology of Exercise Conference, San Diego, CA*: “Swimming Exercise in the Nematode *Caenorhabditis elegans* Promotes Mitochondrial Maintenance and Protects from Mitotoxicant Exposures,” September 2018
4. *56th Annual Society of Toxicology Meeting, San Antonio, TX*: “Humanized, Transgenic Worms to Study CYP2E1-Induced Toxicity,” March 2018
5. *30th Annual NIEHS Superfund Meeting, Philadelphia, PA*: “Humanized, Transgenic *Caenorhabditis elegans* to Study CYP2E1-Induced Mitochondrial and Neurotoxicity,” December 2017
6. 20th North American 21st North American ISSX Meeting, Providence, RI: “Humanized, Transgenic Worms to Study the Role of Mitochondrial CYP2E1 in Toxicant-Induced Mitochondrial Dysfunction and Neurodegeneration,” September 2017
7. 55th Annual Society of Toxicology Meeting, New Orleans, LA: “The Impact of Hepatic Mitochondrial Cyp2e1 Localization in Butadiene-Exposed Mice,” March 2016
8. ISSX Meeting, Orlando, FL: “The Impact and Significance of Cyp2e1 Localization in Butadiene-Exposed Mice,” October 2015
9. 19th North American ISSX and 29th JSSX Meeting, San Francisco, CA: “Mechanism of Oxidation by Mitochondrial CYP2E1 Differs from Microsomal CYP2E1,” October 2014
10. 10th International ISSX Meeting, Toronto, ON, Canada: “CYP2E1 Hydroxylation of Aniline Involves Cooperativity,” September 2013
11. 243rd American Chemical Society National Meeting, San Diego, CA: “Prediction of Enantiospecific Oxidations by CYP2C19 Using a Chirality Code and Artificial Neural Networks,” March 2012

TEACHING ACTIVITIES

Year (Semester)	Course Title, “Lecture Title”	Role	Class Profile	Lecture Hours
2013 (F)	Chemistry, “ <i>Modeling chemical structures using Avogadro</i> ”	Guest Lecturer	25 High School Students at ASMS High School	1
2014 (Su)	Summer Undergraduate Program, “ <i>Applying for NSF Graduate Research Fellowships</i> ”	Guest Lecturer	15 Undergraduates at University of Arkansas at Little Rock	1
2017 (Sp)	ENV237S Population, Health, and Environment, “ <i>Population Toxicology</i> ”	Guest Lecturer	3 Undergraduates, 5 Grad Students at Duke University	2
2017 (Sp)	ENV819 Mechanisms in Environmental Toxicology, “ <i>Regulation, activity, and toxicity of CYP2E1 metabolism</i> ”	Guest Lecturer	8 Grad Students at Duke University	2
2019 (Sp)	ENV360 Environmental Toxicology & Chemistry, “ <i>Phase I, II, and III Xenobiotic Metabolism</i> ”	Guest Lecturer	8 Undergraduate Students at Duke University	2
2019 (Sp)	ENV819 Mechanisms in Environmental Toxicology, “ <i>Mitochondrial CYP2E1 and Chemical Toxicity</i> ”	Guest Lecturer	13 Graduate Students at Duke University	2

STUDENT MENTORSHIP AND SUPERVISION

- Jamie Harris, *Undergraduate Research Assistant*, Duke University June 2017 – present
- Ricky Romersi, *Undergraduate Research Assistant*, Duke University Aug. 2018 – present
- Zachary Markovich, *Undergraduate Research Assistant*, Duke University Sept. 2018 – present
- Nathan Heffernan, *Undergraduate Research Assistant*, Duke University Sept. 2018 – present
- Sanika Gupte, *Undergraduate Research Assistant*, Duke University Sept. 2018 – May 2019
- Michael Saporito, *Undergraduate Research Assistant*, Duke University Sept. 2018 – May 2019
- Kiersten Bell, *Undergraduate Research Assistant*, Duke University Jan. 2017 – May 2018
- Trained 11 undergraduates during graduate school at UAMS 2012-2016

PROFESSIONAL MEMBERSHIPS

- 2011- Society of Toxicology (SOT), Postdoctoral member

- 2012- International Society for the Study of Xenobiotics (ISSX), Postdoctoral member
- 2017- Genetics Society of America (GSA), Postdoctoral member
- 2016- Genetics and Environmental Mutagenesis Society of NC, Postdoctoral member

PROFESSIONAL SERVICE

Editorial Board

- 2017-present: *Drug Metabolism Reviews*

Independent Ad Hoc Reviewer (Number of Manuscripts in Paratheses)

- *Chemico-Biological Interactions* (2)
- *Acta Histachemica* (1)
- *Clinical and Experimental Pharmacology and Physiology* (2)
- *Toxicology* (2)
- *Frontiers in Biochemistry* (1)
- *Aquatic Toxicology* (1)
- *RSC Advances* (1)
- *Process Biochemistry* (1)

Professional Society Service

- 2018-20 Treasurer, Genetics and Environmental Mutagenesis Society of NC
- 2016-19 Chair, ISSX New Investigator Committee
- 2016-19 Member, ISSX Membership Affairs Committee

REFERENCES

Grover P. Miller, Professor of Biochemistry and Molecular Biology

University of Arkansas for Medical Sciences

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Little Rock, AR 72205

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Joel N. Meyer, Truman and Nellie Semans/Alex Brown & Sons Associate Professor of Environmental Toxicology

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Monica Driscoll, Distinguished Professor of Molecular Biology and Biochemistry

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