

BIOGRAPHICAL SKETCH

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NAME: Shelton, Delia S

eRA COMMONS USER NAME (credential, e.g., agency login): SHELTODE9095

POSITION TITLE: Assistant Professor

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE (if applicable)	END DATE MM/YYYY	FIELD OF STUDY
Southwestern University, Georgetown, TX	B.S.	08/2009	Animal Behavior, Spanish
Prairie View A&M University, Prairie View, TX	Teaching Certificate	05/2010	Secondary Education
Indiana University, Bloomington, IN	Ph.D.	09/2016	Developmental Psychobiology
Leibniz Institute for Freshwater Ecology and Inland Fisheries, Berlin, Germany	Postdoc	09/2019	Social Networks
University of Windsor, Windsor, Ontario, Canada	Postdoc	09/2019	Sensory Physiology
Oregon State University, Corvallis, OR	Postdoc	03/2022	Toxicology
University of Georgia, Athens, GA	Postdoc	03/2022	Neuroscience

A. Personal Statement

I am a second year Assistant Professor in the Department of Biology at University of Miami. My lab has been funded by NIH National Institute Environmental Health Sciences and NSF to study how environmental contaminants impact behavior across generations and the neural and genetics mechanisms that underly these germline and transgenerational effects. My NIH NIEHS R00 award is targeted at understanding the adverse effects of dietary cadmium on visual and neurophysiological function and the therapeutic potential of selenium for restoring vision impairments. My lab has extensive experience in assessing behavioral, physiological and histopathological end points in zebrafish and mice in response to environmental challenges (e.g., a-c). My collaboration with Dr. Falagan-Lotsch was sparked by joint engagement in NIH COMPASS training, and continued follow-up through regional and national Society of Toxicology meetings, and departmental seminar exchanges. With the continued collaboration with Drs. Priscila Falagan-Lotsch and Rachael Heuer, we are poised to determine the mechanistic and therapeutic avenues of selenium for cadmium-induced cardiotoxicity (d).

Data Sharing.

Dr. Shelton has a history of sharing wild zebrafish specimens with the larger community. We deposited wild zebrafish from our field collections in the Harvard University Zebrafish facility where these lines are actively maintained and other researchers can freely use them. These lines have been widely used by the zebrafish community. Dr. Shelton regularly posts pre-prints of submitted manuscripts and data to digital repositories to enhance transparency.

Active

NIH NIEHS R00ES03098-05

3/1/2020 – 8/31/2025

Shelton (PI)

Sensory mechanisms of cadmium-induced behavioral disorders across generations.

NIH NIEHS R00ES03098-04

2/25/2023 – 1/31/2025

Shelton (PI)

Diversity supplement: Training in behavioral toxicology through studying the therapeutic potential of selenium for cadmium-induced behavioral disorders.

Animal Behavior Society

Shelton (Co-PI)

10/2020 – 08/2025

SIGNAL: Peer mentoring communities for Black and Indigenous graduate students.

Completed within last 5 years (selected)

UM Diversity Mini-Grant

Shelton/Truong-Vu (Co-PI)

03/13/2023 – 05/31/2023

UM Junior Faculty of Color Writing Group and Writing Retreat

NSF 1904430

12/01/18 – 05/31/2020

Shelton (PI)

Visioglowl: A high-throughput vision assessment tool.

Recent relevant citations:

- a. **Shelton DS**, Dinges ZM, Khemka A, Sykes DJ, Suriyampola PS, Shelton DEP, Boyd P, Kelly JR, Bower M, Amro H, Glaholt SP, Latta MB, Perkins HL, Shaw JR, Martins EP. A pair of cadmium-exposed zebrafish affect social behavior of the un-exposed majority. *Environ Toxicol Pharmacol*. 2023 Jun;100:104119. doi: 10.1016/j.etap.2023.104119. Epub 2023 Apr 5. PMID: 37028532; PMCID: PMC10423439.
- b. **Shelton D. S.**, Suriyampola P.S., Dinges Z.M., Glaholt S.P., Shaw J.R., and Martins, E.P. Plants buffer some of the effects of a pair of cadmium-exposed zebrafish on the un-exposed majority. 2024 *Environmental Toxicology and Pharmacology* 104419 <https://doi.org/10.1016/j.etap.2024.104419>
- c. Chen J, Kong A, **Shelton D**, Dong H, Li J, Zhao F, Bai C, Huang K, Mo W, Chen S, Xu H, Tanguay RL, Dong Q. Early life stage transient aristolochic acid exposure induces behavioral hyperactivity but not nephrotoxicity in larval zebrafish. *Aquat Toxicol*. 2021 Jul 18;238:105916. doi: 10.1016/j.aquatox.2021.105916. Epub ahead of print. PMID: 34303159; PMCID: PMC8881052.
- d. Heuer, R. M., Falagan-Lotsch, P., Okutsu, J., Deperalto, M., Koop, R. R., Umeh, O. G., ... & **Shelton, D. S.** Therapeutic Efficacy of selenium pre-treatment in mitigating cadmium-Induced cardiotoxicity in zebrafish (*Danio rerio*). *Cardiovascular Toxicology*. 2024 24(11), 1287-1300. PMC11445284

B. Positions, Scientific Appointments and Honors

Positions and Employment

2022 –	Assistant Professor, University of Miami, Coral Gables, FL
2021 - 2024	Member-At-Large, Animal Behavior Society
2020 - 2022	NIH NIEHS K99 Fellow, Oregon State University, Corvallis, OR
2016 - 2019	NSF Postdoctoral Fellow in Biology, Leibniz Institute, University of Windsor, and Oregon State University, Corvallis, OR
2011	Coordinator and instructor for NSF-REU site program, Indiana University, Bloomington, IN
2010 - 2015	NSF Graduate Fellow, Indiana University, Bloomington, IN
2010 - 2015	IGERT Fellow in Brain-Body-Environment Systems, Indiana University, Bloomington, IN
2009 - 2010	High school science teacher, Houston Independent School District, Houston, TX
2009	Researcher, University of Ghana, Legon
2008	Animal Caretaker, INBIO Parque, Heredia
2007 - 2008	Researcher in Neuroscience and Drug Discovery, United Negro College Fund - Merck Pharma, Boston, MA

2005 - 2008 Researcher in Aquatic Animal Lab, Southwestern University, Georgetown, TX
 2005 - 2006 Researcher NSF-AGEP program, Rice University, Houston, TX
 2004 - 2004 Researcher in NSF-REU program, Indiana University, Bloomington, IN

Honors

2017 Allee Competition Semi-finalist, Animal Behavior Society
 2014 Be More Engaged Award, City of Bloomington, IN, USA
 2013 Charlotte Mangum Travel Award, Society for Integrative and Comparative Biology
 2012 Alumni Award, ExxonMobil Bernard Harris Summer Science Camp
 2012 Travel Award to International Society for Developmental Biology, NIH NICHD Sackler Institute
 2010 Project Grad Innovation Award, Houston Independent School District
 2009 Student of the Year in Animal Behavior, Southwestern University
 2005-2009 Dixon Scholar, Southwestern University

Journal Peer-review

Animal, Animal Behavior, Aquatic Biology, Biology, Environmental Biology of Fishes, Fishes, Journal of Comparative Psychology, Marine Ecology Progress Series, PeerJ, PLOS ONE, Royal Society Open Science, NPR A Moment in Science. Trends in Ecology and Evolution

C. Contribution to Science

1. **Cadmium toxicity and therapeutics.** As a PI and postdoc, I contributed to large collaborative projects that leveraged my training in behavior, physiology, toxicology, neuroscience and entrepreneurship to study how contaminants including cadmium affect behavior, cardiovascular physiology, and gene expression while developing high- throughput screening tools to test therapeutics (e.g., selenium, plants) using the zebrafish model (a-c). I served as PI for a critical review on a recently accepted paper in *Current Environmental Health Reports* on zebrafish uncovering targets and mechanisms for cadmium toxicity. My efforts to use the zebrafish model as sentinels for pollution were highlighted in *Nature Lab Animal*.
 - a. Heuer, R. M., Falagan-Lotsch, P., Okutsu, J., Deperalto, M., Koop, R. R., Umeh, O. G., ... & **Shelton, D. S.** Therapeutic Efficacy of selenium pre-treatment in mitigating cadmium-Induced cardiotoxicity in zebrafish (*Danio rerio*). *Cardiovascular Toxicology*. 2024, 24(11), 1287-1300. PMC11445284
 - b. **Shelton DS**, Dinges ZM, Khemka A, Sykes DJ, Suriyampola PS, Shelton DEP, Boyd P, Kelly JR, Bower M, Amro H, Glaholt SP, Latta MB, Perkins HL, Shaw JR, Martins EP. A pair of cadmium-exposed zebrafish affect social behavior of the un-exposed majority. *Environ Toxicol Pharmacol*. 2023 Jun;100:104119. doi: 10.1016/j.etap.2023.104119. Epub 2023 Apr 5. PubMed Central PMCID: PMC10423439.
 - c. **Shelton DS**, Dinges ZM, Khemka A, Sykes DJ, Suriyampola PS, Shelton DEP, Boyd P, Kelly JR, Bower M, Amro H, Glaholt SP, Latta MB, Perkins HL, Shaw JR, Martins EP. A pair of cadmium-exposed zebrafish affect social behavior of the un-exposed majority. *Environ Toxicol Pharmacol*. 2023 Jun;100:104119. doi: 10.1016/j.etap.2023.104119. Epub 2023 Apr 5. PMID: 37028532; PMCID: PMC10423439.
2. **Social behavior in wild and domestic zebrafish.** Insights into the social behavior of wild and domestic zebrafish. Zebrafish are model organisms for biomedical and toxicological research. By comparison to the plethora of information we have on their genetics and neural architecture, we know very little about their behavior. I coordinated international expeditions to study the social behavior of wild and domestic zebrafish (a,b), which has shed light on their natural history including documenting the largest zebrafish shoals reported in the literature, and identifying environmental features that influence zebrafish social behavior in the lab and in the field (c,d). These findings informed husbandry management, and studies in learning, behavioral pathologies, anxiety-related disorders, collective behavior and other areas of biomedical and toxicological research where zebrafish are used as a model.
 - a. **Shelton DS**, Shelton SG, Daniel DK, Raja M, Bhat A, Tanguay RL, Higgs DM, Martins EP. Collective behavior in wild zebrafish. *Zebrafish*. 2020 Aug;17(4):243-252. PubMed Central PMCID: PMC7869874.

- b. Suriyampola PS, **Shelton DS**, Shukla R, Roy T, Bhat A, Martins EP. Zebrafish Social Behavior in the Wild. *Zebrafish*. 2016 Feb;13(1):1-8. PubMed PMID: 26671510.
 - c. **Shelton DS**, Price BC, Ocasio KM, Martins EP. Density and group size influence shoal cohesion, but not coordination in zebrafish (*Danio rerio*). *J Comp Psychol*. 2015 Feb;129(1):72-7.
 - d. Suriyampola PS, Iruri-Tucker AA, Padilla-Veléz L, Enriquez A, **Shelton DS**, Martins EP. Small increases in group size improve small shoals' response to water flow in zebrafish. *J Zool* 2022 Apr;316(4):271-281. doi: 10.1111/jzo.12952. PMCID: PMC9269864.
3. **Anthropogenic effects on behavior and physiology.** A more complete understanding of environmental influences on developmental thermobiology. Anthropogenic change is altering the habitats of animals at alarming rates. Determining if and how animals can adapt to a changing world is important for developing intervention plans (a). I have assessed the effects of elevated temperatures and environmental structure on development, and energetics of house mice (b). These studies led to a more complete understanding of how different life stages may be impacted by elevated temperatures.
 - a. **Shelton DS**, Alberts JR. Development of behavioral responses to thermal challenges. *Dev Psychobiol*. 2018 Jan;60(1):5-14. PubMed Central PMCID: PMC5747986.
 - b. **Shelton DS**, Meyer PM, Ocasio KM. Environmental structure and energetic consequences in groups of young mice. *Physiol Behav*. 2017 Aug 1;177:155-160. PubMed Central PMCID: PMC6023618.
4. **Extracts affect behavior and physiology.** Our work in toxicology and pharmacology has led us to studies of natural and synthetic extracts used in western and eastern medicine. We have identified the effects of these extracts (e.g., plants, water) on behavior, physiology, and morphology (a-c). This demonstrates the translational value of the zebrafish for human and environmental health.
 - a. Chen J, Kong A, **Shelton D**, Dong H, Li J, Zhao F, Bai C, Huang K, Mo W, Chen S, Xu H, Tanguay RL, Dong Q. Early life stage transient aristolochic acid exposure induces behavioral hyperactivity but not nephrotoxicity in larval zebrafish. *Aquat Toxicol*. 2021 Jul 18;238:105916. doi: 10.1016/j.aquatox.2021.105916. Epub ahead of print. PMID: 34303159; PMCID: PMC8881052.
 - b. †Dillon G. M, †**Shelton D.**, McKinney A. P., Caniga M., Marcus J. N., Ferguson M. T., Kornecook T.J., and Dodart, J.C., (2009). Prefrontal cortex lesions and scopolamine impair attention performance of C57BL/6 mice in a novel 2-choice visual discrimination task, *Behavioral Brain Research*, 204, 67-76. †co-first authors.
 - c. Kelly JR, Shelton SG, Daniel DK, Bhat A, Mondal R, Nipple F, Amro H, Bower ME, Isaac G, McHaney G, Martins EP, **Shelton DS**. Wild zebrafish sentinels: Biological monitoring of site differences using behavior and morphology. *Toxics*. 2021 Jul 12;9(7) PubMed Central PMCID: PMC8309768.