

## CURRICULUM VITAE

DANIEL J. SPADE, PH.D.

### PERSONAL INFORMATION

Business Address: Brown University, Department of Pathology & Laboratory Medicine  
Box G-E5, Providence, RI 02912

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### PROFESSIONAL APPOINTMENTS

Assistant Professor, Department of Pathology and Laboratory Medicine  
Brown University, Providence, RI 07/2018 – present

Postdoctoral Research Associate/Postdoctoral Fellow  
Brown University, Providence, RI, Mentor: Kim Boekelheide 09/2011 – 07/2018

### EDUCATION

Ph.D., Veterinary Medical Sciences, Toxicology concentration  
University of Florida, Gainesville, FL, Advisor: Nancy Denslow 2007 – 2011  
Dissertation: The role of zinc and copper accumulation in queen conch, *Strombus gigas*, reproductive deficiency at nearshore sites in the Florida Keys

B.S., Biology, with distinction  
The Pennsylvania State University, University Park, PA 2003 – 2007

### RESEARCH SUPPORT

#### Ongoing

2024 Seed Award (**Spade: PI**) 02/01/24 – 06/30/25  
Office of the Vice President for Research, Brown University  
Title: Germ cell toxicity of a low-dose phthalate mixture  
Goal: to test whether a nine-phthalate mixture has cumulative (additive) effects on germ cell development

2023 Pilot Project Research Award (**Spade: Co-Investigator**) PI: Adina Badea 05/01/23 – 04/30/25  
Department of Pathology and Laboratory Medicine, Brown University  
Title: A look into environmental reproductive toxicology: robust quantification of steroid hormones, cholesterol, and arachidonic acid levels in phthalate-exposed rat fetal testes  
Goal: to develop robust mass spectrometry methods for multiple analytes relevant to phthalate toxicity and test the impact of phthalates on metabolites important for development of rat and mouse fetal testes

#### Submitted, Pending Review

P20 COBRE Center for RNome Biology in Health and Disease (**Spade: Research Project Leader**)  
PI: William Fairbrother  
National Institute of General Medical Sciences  
Title: miRNAs as Mediators of Developmental Toxicity following Paternal Germ Cell Toxicant Exposure  
Goal: To determine how the germ cell toxicant, ethylene glycol monomethyl ether (EGME), alters rat sperm RNA m<sup>6</sup>A methylation and the consequences for transcriptional regulation in the embryo.

## Completed

### U54 GM115677 (**Spade: Pilot Project MPI**)

MPIs: Gabriella Avellino and Virginia Mensah, PI: Sharon Rounds

11/01/22 – 01/31/24

National Institute of General Medical Sciences

Title: Prospective Study of Spermatozoal RNA and IVF Embryo Development

Goal: to identify the sperm mRNA expression differences that are most predictive of successful IVF outcomes in human patients

### R00 ES025231 (**Spade: PI**)

09/01/18 – 08/31/21

National Institute of Environmental Health Sciences

Title: Retinoic Acid Signaling Disruption by Phthalates in Human and Rodent Fetal Testis

Goal: to determine how environmental exposure to phthalates, a widely distributed class of industrial chemicals, adversely affects the fetal development of the testis through disruption of the retinoic acid signaling pathway.

### P20 GM121298 (**Spade: Pilot Project PI**) PI: Surendra Sharma

03/01/20 – 08/31/21

National Institute of General Medical Sciences

Title: Identification of Sperm RNAs that Reflect ICSI Outcomes

Goal: to quantify the relationship between human sperm RNA content and history of reproductive outcomes in three populations of human male patients presenting for fertility analysis.

### K99 ES025231 (**Spade: PI**)

01/01/16 – 08/31/18

National Institute of Environmental Health Sciences

Title: Retinoic Acid Signaling Disruption by Phthalates in Human and Rodent Fetal Testis

## HONORS AND AWARDS

- |         |   |
|---------|---|
| 2018    | Edward W. Carney Trainee Award, Reproductive and Developmental Toxicology Specialty Section, Society of Toxicology                              |
| 2014    | Best Paper Award, Reproductive and Developmental Toxicology Specialty Section, Society of Toxicology  |
| 2012-15 | T32 Training Grant Postdoctoral Appointment, "Training in Environmental Pathology," PI: Agnes Kane  |
| 2009    | Student Participant, Pellston Workshop, "A Vision and Strategy for Predictive Ecotoxicology in the 21 <sup>st</sup> Century"                    |
| 2008    | Elsevier Best Student Presentation in Toxicogenomics, first place   |
| 2008    | Society of Environmental Toxicology and Chemistry   |
| 2008    | Best Student Paper Award for Platform Presentations, first place, Southeastern Chapter of the Society of Environmental Toxicology and Chemistry |
| 2007-11 | Alumni Fellowship, University of Florida  |

## SCIENTIFIC PUBLICATIONS

### Submitted Manuscripts

1. **Spade, D.J.** Plastics and Male Reproduction. *Submitted chapter* for Encyclopedia of Reproduction, 3 ed. Skinner, M.K. & Loveland, K., eds. Elsevier Academic Press, Cambridge, MA, USA. Anticipated publication in 2026.
2. Gupta, M.V., Conley, J.M., Lambright, C., Chin, L.F., Hall, S.J., Gray, L.E. & **Spade, D.J.** Dose-response assessment of dipentyl phthalate effects on testosterone production and morphogenesis of late-gestation fetal rat testis. *Submitted.*

## Peer-Reviewed Publications

1. Alhasnani, M.A., Loeb, S., Hall, S.J., Caruolo, Z., Simmonds, F., Solano, A.E. & **Spade, D.J.** (2022). Interaction between mono-(2-ethylhexyl) phthalate and retinoic acid alters Sertoli cell development during fetal mouse testis cord morphogenesis. *Current Research in Toxicology*, 3, 100087. PMID: [PMC9520016](#). doi: [10.1016/j.crttox.2022.100087](#).
2. Li, H. & **Spade, D.J.** (2021). Environmental exposures, fetal testis development and function: phthalates and beyond. *Reproduction*, 162(5), F147-F167. PMID: [PMC8497445](#). doi: [10.1530/REP-20-0592](#). *Review*.
3. Bell, S., Zsom, A., Conley, J. & **Spade, D.J.** (2020). Automated identification of multinucleated germ cells with U-Net. *PLoS One*, 15(7), e0229967. PMID: [PMC7347116](#). doi: [10.1371/journal.pone.0229967](#).
4. **Spade, D.J.**, Hall, S.J., [Wortzel, J.D.<sup>ug</sup>](#), [Reyes, G.<sup>ug</sup>](#) & Boekelheide, K. (2019). All-trans retinoic acid disrupts development in ex vivo cultured fetal rat testes. II: Modulation of mono-(2-ethylhexyl) phthalate toxicity. *Toxicological Sciences*, 168(1), 149-159. PMID: [PMC6390659](#). doi: [10.1093/toxsci/kfy283](#).
5. **Spade, D.J.**, Dere, E.D., Hall, S.J., Schorl, C., Freiman, R.N. & Boekelheide, K. (2019). All-trans retinoic acid disrupts development in ex vivo cultured fetal rat testes. I: Altered seminiferous cord maturation and testicular cell fate. *Toxicological Sciences*, 167(2), 546-558. PMID: [PMC6358251](#). doi: [10.1093/toxsci/kfy260](#).
6. Dere, E., Anderson, L.M., Huse, S.M., **Spade, D.J.**, McDonnell-Clark, E., Madnick, S.J., Hall, S.J., Camacho, L., Lewis, S.M., Vanlandingham, M.M. & Boekelheide, K. (2018). Effects of continuous bisphenol A exposure from early gestation on 90 day old rat testes function and sperm molecular profiles: a CLARITY-BPA consortium study. *Toxicology and Applied Pharmacology*, 347, 1-9. PMID: [PMC6412024](#). doi: [10.1016/j.taap.2018.03.021](#).
7. **Spade, D.J.**, Bai, C.Y., Lambright, C., Conley, J.M., Boekelheide, K. & Gray, L.E. (2018). Validation of an automated counting procedure for phthalate-induced testicular multinucleated germ cells. *Toxicology Letters*, 290, 55-61. PMID: [PMC5921076](#). doi: [10.1016/j.toxlet.2018.03.018](#).
8. Dai, M.S., Hall, S.J., Vantangoli Policelli M.M., Boekelheide, K. & **Spade, D.J.** (2017). Spontaneous testicular atrophy occurs despite normal spermatogonial proliferation in a *Tp53* knockout rat. *Andrology*, 5(6), 1141-52. PMID: [PMC5673550](#). doi: [10.1111/andr.12409](#). **Cover article**.
9. Dere, E., **Spade, D.J.**, Hall, S.J., Altemus, A., Smith, J.D., Phillips, J. A., Moffit, J.S., Blanchard, K.T. & Boekelheide, K. (2017). Identification of sperm mRNA biomarkers associated with testis injury during preclinical testing of pharmaceutical compounds. *Toxicology and Applied Pharmacology*, 320:1-7. PMID: [28167222](#). doi: [10.1016/j.taap.2017.02.001](#).
10. **Spade, D.J.**, Hall, S.J., Wilson, S., & Boekelheide, K. (2015). Di-*n*-butyl phthalate induces multinucleated germ cells in the rat fetal testis through a non-proliferative mechanism. *Biology of Reproduction*, 93(5), 110. PMID: [PMC4712002](#). doi: [10.1095/biolreprod.115.131615](#).
11. **Spade, D.J.**, McDonnell, E.V., Heger, N.E., Sanders, J.A., Saffarini, C.M., Gruppuso, P.A., De Paepe, M.E. & Boekelheide, K. (2014). Xenotransplantation models to study the effects of toxicants on human fetal tissues. *Birth Defects Research, Part B, Developmental and Reproductive Toxicology*, 101(6), 410-22. PMID: [PMC4526820](#). doi: [10.1002/bdrb.21131](#). *Review*. **Cover article**.
12. **Spade, D.J.**, Hall, S.J., Saffarini, C.M., Huse, S.M., McDonnell, E.V. & Boekelheide, K. (2014). Differential response to abiraterone acetate and di-*n*-butyl phthalate in an androgen-sensitive human fetal testis xenograft bioassay. *Toxicological Sciences*, 138(1), 148-60. PMID: [PMC3930360](#). doi: [10.1093/toxsci/kft266](#).
13. Saffarini, C.M., McDonnell, E.V., Amin, A., **Spade, D.J.**, Huse, S.M., Kostadinov, S., Hall, S.J. & Boekelheide, K. (2013). Maturation of the developing human fetal prostate in a rodent xenograft model. *The Prostate*, 73(16), 1761-75. PMID: [PMC4306740](#). doi: [10.1002/pros.22713](#).

14. Garcia-Reyero, N., Martyniuk, C.J., Kroll, K.J., Escalon, B.L., **Spade, D.J.** & Denslow, N.D. (2013). Transcriptional signature of progesterone in the fathead minnow ovary (*Pimephales promelas*). *General and Comparative Endocrinology*, 192, 159-69. PMID: [PMC4349561](#). doi: [10.1016/j.ygcen.2013.06.008](#).
15. Titley-O'Neal, C.P., **Spade, D.J.**, Zhang, Y., Kan, R., Martyniuk, C.J., Denslow, N.D. & MacDonald, B.A. (2013). Gene expression profiling in the ovary of Queen conch (*Strombus gigas*) exposed to environments with high tributyltin in the British Virgin Islands. *The Science of the Total Environment*, 449:52-62. PMID: [23410894](#). doi: [10.1016/j.scitotenv.2013.01.028](#).
16. Weil, R.E., **Spade, D.J.**, Knoebl, I., Hemming, J.M., Tongue, M.L., Szabo, N.J., Kroll, K.J., Tate, W.B. & Denslow, N.D. (2012). Evaluation of water quality threats to the endangered Okaloosa darter (*Etheostoma okaloosae*) in East Turkey Creek on Eglin Air Force Base. *Aquatic Toxicology*, 110-111, 177-86. PMID: [22326655](#). doi: [10.1016/j.aquatox.2012.01.007](#).
17. Mehinto, A.C., Martyniuk, C.J., **Spade, D.J.** & Denslow, N.D. (2012). Applications for next-generation sequencing in fish ecotoxicogenomics. *Frontiers in Genetics*, 3, 62. PMID: [PMC3336092](#). doi: [10.3389/fgene.2012.00062](#). *Review*.
18. **Spade, D.J.**, Knoebl, I. & Denslow, N.D. (2011). Cesium chloride gradient centrifugation improves the quality of *Strombus gigas* and *Montastraea faveolata* RNA preparations. *Journal of Experimental Marine Biology and Ecology*, 402(1-2), 43-48. doi: [10.1016/j.jembe.2011.03.015](#).
19. Martyniuk, C.J., **Spade, D.J.**, Blum, J.L., Kroll, K.J. & Denslow, N.D. (2011). Methoxychlor affects multiple hormone signaling pathways in the largemouth bass (*Micropterus salmoides*) liver. *Aquatic Toxicology*, 101(3-4), 483-92. PMID: [PMC3222593](#). doi: [10.1016/j.aquatox.2010.12.002](#).
20. Kramer, V.J., Etterson, M.A., Hecker, M., Murphy, C.A., Roesijadi, G., **Spade, D.J.**, Spromberg, J.A., Wang, M. & Ankley, G.T. (2011). Adverse outcome pathways and ecological risk assessment: bridging to population-level effects. *Environmental Toxicology and Chemistry*, 30(1), 64-76. PMID: [20963853](#). doi: [10.1002/etc.375](#). *Review*.
21. **Spade, D.J.**, Griffitt, R.J., Liu, L., Brown-Peterson, N.J., Kroll, K.J., Feswick, A., Glazer, R.A., Barber, D.S. & Denslow, N.D. (2010). Queen conch (*Strombus gigas*) testis regresses during the reproductive season at nearshore sites in the Florida Keys. *PLoS One*, 5(9), e12737. PMID: [PMC2939879](#). doi: [10.1371/journal.pone.0012737](#).
22. Martyniuk, C.J., Feswick, A., **Spade, D.J.**, Kroll, K.J., Barber, D.S. & Denslow, N.D. (2010). Effects of acute dieldrin exposure on neurotransmitters and global gene transcription in largemouth bass (*Micropterus salmoides*) hypothalamus. *Neurotoxicology*, 31(4), 356-66. PMID: [PMC2882520](#). doi: [10.1016/j.neuro.2010.04.008](#).

## PROFESSIONAL SOCIETY MEMBERSHIPS

- 2017 – American Society of Andrology
- 2011 – Society of Toxicology
- 2011 – Molecular and Systems Biology Specialty Section
- 2012 – Reproductive and Developmental Toxicology Specialty Section
- 2008 – Society of Environmental Toxicology and Chemistry

## SERVICE

### To the University

- 2024 – Chair, Environmental Carcinogenesis Working Group, Legoretta Cancer Center
- 2022 – Seminar Committee, Therapeutic Sciences Graduate Program
- 2020 – Steering Committee, Pathobiology Graduate Program
- 2019 – Seminar Series Coordinator, Department of Pathology and Laboratory Medicine

- 2022 – 23 Admissions Committee, Pathobiology Graduate Program
- 2023 Pathobiology Graduate Program Retreat Organizer
- 2020 – 21 Admissions Committee, Pathobiology Graduate Program
- 2020 – 21 Seminar Committee, Pathobiology Graduate Program
- 2019 – 20 Search Committee: Director, Center to Advance Predictive Biology
- 2019 – 20 Search Committee: Manager, Molecular Pathology Core
- 2019 – 20 Admissions Committee, Pathobiology Graduate Program
- 2018 – 19 Admissions Committee, Pathobiology Graduate Program
- 2019/07/31 Brown Postdoctoral Retreat Panelist, “Transition from Postdoc to Faculty”
- 2016/03/09 Brown Superfund Research Program/NIEHS T32 Workshop, Discussion Leader, “Polyfluorinated Compounds as a Toxic Tort Case”
- 2016/06/08 Panelist, Brown University BioMed Office of Graduate and Postdoctoral Studies K99 Panel Discussion, “Tips and Advice on Putting Together a Successful Application”

## **To the Profession**

### *Grant Reviewing*

- 2022 Agence Nationale de la Recherche (France) Evaluation Panel CE34 – Contaminants, Ecosystems and Health
- 2021 NIH Scientific Review Group ZES1 LAT-S (SF) 1: Superfund Working Group Phase I and II
- 2019 NIH Scientific Review Group ZES1 JAB-D (SF): P42 Superfund Grant Applications
- 2019 NIH Scientific Review Group ZES1 JAB-D (R1): R01 ViCTER Environmental Research Grant Applications

### *Technical Report Reviewing*

- 2024 U.S. Environmental Protection Agency Science Advisory Committee on Chemicals (SACC) ad hoc peer reviewer, Peer Review of EPA’s Draft Risk Evaluation for Di-isodecyl Phthalate (DIDP) and Draft Hazard Assessment for Di-isononyl Phthalate (DINP)
- 2022 National Toxicology Program Expert Panel, Peer Review of the Draft NTP Developmental and Reproductive Toxicity Technical Report on the Modified One-Generation Study of Bisphenol AF
- 2021 National Toxicology Program Expert Panel, Peer Review Meeting of the Draft NTP Technical Reports on the Toxicology and Carcinogenesis Studies of Sodium Tungstate Dihydrate, Di-*n*-butyl Phthalate, and Di(2-ethylhexyl) Phthalate

### *Professional Society Service*

- 2022 – American Society of Andrology Constitution and Bylaws Committee Chair
- 2020 – 22 New Career Councilor, Reproductive and Developmental Toxicology Specialty Section, Society of Toxicology
- 2020 Expert Panel Trainee Discussion, Northeast Society of Toxicology Annual Meeting
- 2019 Program Committee, Northeast Society of Toxicology Annual Meeting
- 2019 Session Chair, “Preconception Exposure to Toxicants: Assessing Gamete Quality and Reproductive Outcomes,” Society of Toxicology Annual Meeting
- 2019 Society of Toxicology Reproductive and Developmental Toxicology Specialty Section Annual Meeting Program Committee
- 2019 Society of Toxicology Reproductive and Developmental Toxicology Specialty Section Annual Meeting Student/Postdoc Poster Competition Judge

- 2018, 2019 Table Host/Discussion Leader, Society of Toxicology Special Event, “*In Vitro* Toxicology Lecture and Luncheon”
- 2019/10/09 Society of Toxicology Molecular and Systems Biology Specialty Section/Graduate Student Leadership Council Webinar, “Get Noticed! Writing Abstracts and Award Applications to Get Your Science Recognized”
- 2018 Continuing Education Volunteer, Society of Toxicology Annual Meeting
- 2016 – 17 Councilor, Postdoctoral Assembly Executive Board, Society of Toxicology
- 2017 Special Event Co-Chair, “Career Exploration through Speed Informational Interviews”
- 2017 Poster Session Chair, “Developmental and Juvenile Toxicity,” Society of Toxicology Annual Meeting
- 2017 Volunteer, Education Committee Event, “Networking for the Next Generation,” Society of Toxicology Annual Meeting
- 2014 – 16 Postdoctoral Representative to Education Committee, Society of Toxicology
- 2016 Co-Chair, Society of Toxicology Special Event, “*In Vitro* Toxicology Lecture and Luncheon”
- 2015 Co-Chair, Society of Toxicology Special Event, “*In Vitro* Toxicology Lecture and Luncheon”
- 2014 Session Chair, “Evaluating Endocrine Disrupting Chemicals: Identifying Species Differences and Approaches for Cross-Species Extrapolation,” Society of Environmental Toxicology and Chemistry Annual Meeting
- 2013 – 14 Postdoctoral Representative to Molecular and Systems Biology Specialty Section, Society of Toxicology

*Scientific Journal Service*

- 2023 – 24 Co-Guest Editor, *Frontiers in Toxicology* special collection: “New thoughts on emerging and classical contributors to male reproductive toxicology”

Peer reviews (n = 76 total)

- 2016 – 24 *Toxicological Sciences*
- 2019 – 24 *Environmental Health Perspectives*
- 2017 – 24 *Biology of Reproduction*
- 2016 – 24 *Environmental Research*
- 2019 – 23 *Toxicology and Applied Pharmacology*
- 2019 – 2023 *Reproduction*
- 2024 *BMC Biology*
- 2023 *Human Reproduction Update*
- 2023 *Toxicology Letters*
- 2023 *Toxicology in Vitro*
- 2023 *Reproductive Biology*
- 2023 *Theriogenology*
- 2023 *International Journal of Experimental Pathology*
- 2023 *Translational Andrology and Urology*
- 2017 – 23 *Journal of Pediatric Urology*
- 2016 – 23 *Environmental Science and Pollution Research*

2019 – 23	<i>American Journal of Reproductive Immunology</i>
2021 – 22	<i>BMC Medicine</i>
2022	<i>Current Research in Toxicology</i>
2022	<i>PNAS Nexus</i>
2022	<i>Food and Chemical Toxicology</i>
2021	<i>Toxicology</i>
2021	<i>Environmental Epidemiology</i>
2021	<i>Environmental Epigenetics</i>
2020	<i>Andrology</i>
2020	<i>PeerJ</i>
2020	<i>Scientific Reports</i>
2019 – 20	<i>Reproductive Toxicology</i>
2019	<i>Environment International</i>
2018	<i>PLOS ONE</i>
2018	<i>Environmental Pollution</i>
2017	<i>Environmental and Molecular Mutagenesis</i>

## TEACHING

### Courses Taught

1. BIOL 1865/2865: Toxicology, Course Leader  
Spring 2024; Total Enrollment: 32 (25 undergraduate, 7 graduate, including remote)  
Spring 2023; Total Enrollment: 18 (11 undergraduate, 7 graduate)  
Spring 2022; Total Enrollment: 28 (20 undergraduate, 8 graduate)  
Spring 2020; Total Enrollment: 18 (17 undergraduate, 1 graduate)

### Guest Lectures

1. “Toxicity Testing Requirements, *in Vitro* Testing Progress and Challenges,” 2024 February 12. *In Vitro* Models for Disease (BIOL 2167), Brown University, Course Instructor: Jacqueline Schell
2. “Toxicology and Toxicity Testing,” 2023 February 13. *In Vitro* Models for Disease (BIOL 2167), Brown University, Course Instructor: Jacqueline Schell
3. “Male Reproductive Toxicology,” 2022 April 12, Environmental Health and Disease (BIOL 1820), Brown University, Course instructor: Jessica Plavicki
4. “Toxicity Testing Past, Present, and Future,” 2022 February 8, *In Vitro* Models for Disease (BIOL 2167), Brown University, Course Instructor: Jacqueline Schell
5. “Reproductive Organ Toxicity,” 2014 March 19, Environmental Health and Disease (BIOL 1820), Brown University, Course instructor: Tatiana Johnston
6. “Toxicology Basics,” 2013 March 4, Environmental Technologies and Human Health (ENG 2920D), Brown University, Course instructor: James Rice
7. “Environmental Toxicology,” 2012 April 20, Human Biology (BIO 122), Providence College, Course instructor: Nicholas Heger

### Teaching Assistant and Peer Mentor

1. Teaching Assistant, Ecotoxicology and Risk Assessment (VME 6934)  
2011, College of Veterinary Medicine, University of Florida

2. Teaching Assistant, Basic Concepts and Biodiversity (BIOL 110) Laboratory/Recitation 2005, Department of Biology, The Pennsylvania State University
3. Peer Mentor, Function and Development of Organisms (BIOL 240) 2005, Department of Biology, The Pennsylvania State University

### **Graduate Trainees**

- 2022 – 24 Xinran (Evelyn) Qi, Biotechnology ScM Program
- 2019 – 24 Maha Abdullah A Alhasnani, Pathobiology Ph.D. Program
- 2021 Kimberly Meza, Pathobiology Ph.D. Program (rotation student)
- 2021 Ying Lin, Pathobiology Ph.D. Program (rotation student)
- 2021 Shade Rodriguez, Pathobiology Ph.D. Program (rotation student)

### **Graduate Thesis Committees**

- 2024 Sophie Chaviari, Biotechnology Sc.M. Program, Thesis Advisor: Jessica Plavicki
- 2023 – Shade Rodriguez, Pathobiology Ph.D. Program, Thesis Advisor: Craig LeFort
- 2022 – 23 Dana Biechele-Speziale, Chemistry Ph.D. Program, Thesis Advisor: Jessica Plavicki
- 2020 – 24 Maryam Bonakdar, Pathobiology Ph.D. Program, Thesis Advisor: Shipra Vaishnav
- 2019 – 23 Layra Cintron-Rivera, Pathobiology Ph.D. Program (Chair), Thesis Advisor: Jessica Plavicki

### **Senior Thesis Trainees**

- 2023 – 24 Saadhya Bahudodda, Brown University  
Senior Thesis, “EGME-induced Effects on Sperm RNA in Embryo Development”
- 2022 – 23 Logan Chin, Brown University  
Senior Thesis, Biochemistry: “Glowing Green Gonadal Grains : An Investigation into the Effects of di-(2-Ethylhexyl) Phthalate on Germ Cells and Their Intercellular Bridges in the Mouse Fetal Testis”
- 2022 – 23 Maansi Gupta, Brown University  
Senior thesis, Biology: “Analysis and Quantification of DPeP-Induced Toxicity in the Rat Fetal Testis”  
UTRA Award: “Evaluating vascular development in the mouse fetal testis following exposure to dipentyl phthalate”
- 2019 – 20 Skylar Loeb, Brown University  
Senior thesis, Biology: “Mono-(2-ethylhexyl) phthalate and retinoic acid interact to alter somatic cell development in the fetal mouse testis.”
- 2019 – 21 Rebka Ephrem, Brown University  
Senior thesis, Biology: “Phthalate toxicity on the developing testis through disruption of retinoic acid signaling and angiogenesis”

### **Senior Thesis Committees**

- 2019 Catherine Seitz, Brown University  
Role: second reader. Thesis Advisor: Jessica Plavicki

### **Other Undergraduate Mentoring**

- 2023 – Cindy Su, Brown University
- 2023 – Darren Chen, Brown University
- 2023 – Toni Johnson, Brown University  
Independent Study, “Effects of in Utero Dipentyl Phthalate Exposure on Later Life Testis Function”



- 2023 – Saira Moazzam, Brown University  
Independent Study, “Evaluating FDA Labeling Practices for Drugs with Male Reproductive Toxicity”
- 2023 – Elis Soord, Brown University  
Independent Study, “Pharmaceutical Labeling Review Project”
- 2022 Amanda Solano, College of Mount Saint Vincent  
Leadership Alliance SR-EIP
- 2021 – 22 Jason Fox, Brown University  
Independent Study, “Disruption of vascular development as a mechanism of fetal testicular phthalate toxicity”
- 2021 – 22 Eva Durandean, Brown University  
UTRA Award, “Spermatogonial death in aging mice.”
- 2020 Thor Stead, Brown University  
SPRINT Award, “Mechanisms of aging and toxicant-induced testicular injury”
- 2019 – 20 Faith Simmonds, Howard University  
Leadership Alliance SR-EIP: “Mono-(2-ethylhexyl) phthalate toxicity in cultured fetal mouse ovary” (2019); “Pathway analysis of mono-(2-ethylhexyl) phthalate mediated signaling disruptions in fetal mouse testis” (2020)
- 2016 Gerardo Reyes, College of Mount Saint Vincent  
Leadership Alliance SR-EIP: “The adverse effects of retinoic acid and mono-(2-ethylhexyl) phthalate and their interaction in fetal rat testes seminiferous cord development.”
- 2015 – 16 Jeremy Wortzel, Brown University  
Senior thesis: “Phthalates and Retinoic Acid Pathways during Fetal Rat Seminiferous Cord Development.”
- 2012 – 14 Matthew Dai, Brown University  
Senior thesis: “*Tp53* knockout rat exhibits impaired spermatogenesis and seminiferous tubule atrophy.”

### **Undergraduate Student Advising in Biology AB/ScB Concentrations**

- 2024-25 Five second- to fourth-year students
- 2023-24 Five third- and fourth-year students
- 2022-23 Eight second- to fourth-year students
- 2021-22 Four second- and third-year students
- 2020-21 Three second-year students

### **Other Mentoring**

- 2022 Brown Pathology & Laboratory Medicine High School Internship Program: 1 student

### **Training in Teaching and Mentoring**

- 2023 Advance-CTR Mentoring Training Program, Facilitated by certified National Research Mentoring Network (NRMN) and Center for the Improvement of Mentored Experiences in Research (CIMER) faculty mentors
- 2012 – 16 The Harriet W. Sheridan Center for Teaching and Learning, Brown University
- 2015 – 16 Certificate III: The Professional Development Seminar
- 2013 – 14 Certificate II: The Course Design Seminar – Principles + Practice
- 2012 – 13 Certificate I: Sheridan Teaching Seminar – Reflective Teaching

## ABSTRACTS AND PRESENTATIONS

### Invited Seminars

1. Sperm RNAs in male reproductive toxicology and infertility. Seminar. Department of Physiological Sciences, University of Florida College of Veterinary Medicine. 12 September 2023.
2. Distinct human sperm RNA profiles in populations with different reproductive histories. The HUST Key Partnership Initiative Program of the Institute of Reproductive Health, Huazhong University of Science and Technology. 15 October 2021. Virtual.
3. Fetal testis patterning and the roads to phthalate syndrome. Seminar. Department of Environmental Health Science, University of Massachusetts Amherst. 21 April 2021. Virtual.
4. Fetal testis development and the road(s) to phthalate syndrome. Seminar. Interdepartmental Toxicology Graduate Program, Iowa State University. 20 October 2020. Virtual.

### National/International Meeting Abstracts

5. **Spade, D.J.** Investigating Low-Dose Effects of Male Reproductive Toxicants: Phthalates and Ethylene Glycol Monomethyl Ether. Oral Presentation (Invited). Mammalian Reproduction Gordon Research Conference: Diverse Strategies to Advance Reproductive Science and Health, Castelldefels, Spain, 21-26 July, 2024.
6. **Spade, D.J.** Impacts of Gestational Phthalate Exposure on Seminiferous Cord Development. Oral Presentation (Invited). XXVII North American Testis Workshop, Denver, CO, 2-5 May, 2024.
7. **Spade, D.J.** Mouse and Rat Models to Address Gaps in Fetal Testicular Phthalate Toxicity. Symposium Presentation (Invited). American Society of Andrology 48<sup>th</sup> Annual Meeting, Boston, MA, 19-23 April, 2023.
8. **Spade, D.J.**, Guang, A., Pu, Y., Stermer, A.R., and Hall, S.J. Preconception exposure to ethylene glycol monomethyl ether alters abundance of developmentally important miRNAs in rat sperm. Poster presentation. Society of Toxicology 62<sup>nd</sup> Annual Meeting, Nashville, TN, 19-23 March, 2023.
9. Alhasnani, M.A., Hall, S.J., Chin, L., Gupta, M. and **Spade, D.J.** Gestational exposure to di-(2-ethylhexyl) phthalate alters fetal mouse testicular organogenesis. Poster presentation. Society of Toxicology 62<sup>nd</sup> Annual Meeting, Nashville, TN, 19-23 March, 2023.
10. **Spade, D.J.**, Avellino, G., Berg, W., Bearely, P., Hall, S.J., and Sigman, M. Sperm mRNA profiles reflect reproductive history in patients presenting for vasectomy or infertility assessment. Oral presentation. American Society of Andrology 47<sup>th</sup> Annual Meeting, La Jolla, CA, 7-10 May, 2022.
11. Ephrem, R.K., Kossack, M.E., Alhasnani, M., Fox, J., Lin, Y., Hall, S.J., Plavicki, S.J., and **Spade, D.J.** Impact of di-(2-ethylhexyl) phthalate on vascular development in rodent fetal testes. Poster Presentation. Society of Toxicology 61<sup>st</sup> Annual Meeting, San Diego, CA, 27-31 March, 2022.
12. **Spade, D.J.** Disruption of retinoic acid signaling: a mechanism of phthalate toxicity in the seminiferous cord. Symposium Presentation. Society of Toxicology 60<sup>th</sup> Annual Meeting, Virtual Event, 12-26 March 2021.
13. Alhasnani, M.A.A., Loeb, S., Caruolo, Z., Hall, S.J., **Spade, D.J.** Mono-(2-ethylhexyl) phthalate interaction with retinoic acid signaling alters fetal mouse testicular somatic cell differentiation and spatial patterning. Poster Presentation. Society of Toxicology 60<sup>th</sup> Annual Meeting, Virtual Event, 12-26 March 2021.
14. Ephrem, R., **Spade D.J.** All-trans retinoic acid effects on germ cells differ between *ex vivo* cultured mouse and rat fetal testes. Poster Presentation. Society of Toxicology 60<sup>th</sup> Annual Meeting, Virtual Event, 12-26 March 2021.
15. Simmonds, F., Alhasnani, M., **Spade, D.J.** Pathway analysis of mono-(2-ethylhexyl) phthalate mediated signaling disruptions in fetal mouse testis. Poster Presentation. The Annual Biomedical Research Conference for Minority Students, Virtual Event, 9-13 November 2020.

16. Alhasnani, M.A.A., Loeb, S., Caruolo, Z., Ephrem, R., Hall, S.J., **Spade, D.J.** Mono-(2-ethylhexyl) phthalate enhances all-trans retinoic acid toxicity in *ex vivo* cultured fetal mouse testis. Poster Presentation. Society of Toxicology 59<sup>th</sup> Annual Meeting, Anaheim, CA, 15-19 March 2020. *Meeting Cancelled*.
17. **Spade, D.J.**, Conley, J.M., Lambright, C., Bell, S., Zsom, A., Gray, L.E. Dipentyl phthalate induces multinucleated germ cells and reduces testosterone in the rat fetal testis with a similar dose-response. Poster Presentation. Society of Toxicology 59<sup>th</sup> Annual Meeting, Anaheim, CA, 15-19 March 2020. *Meeting Cancelled*.
18. Simmonds, F., Caruolo, Z., Hall, S.J., **Spade, D.J.** Mono-(2-ethylhexyl) phthalate toxicity in cultured fetal mouse ovary. Poster Presentation. The Annual Biomedical Research Conference for Minority Students, Anaheim, CA, 13-16 November 2019.
19. **Spade, D.J.**, Hall, S.J. Interaction between mono-(2-ethylhexyl) phthalate and all-trans retinoic acid alters development of *ex vivo* cultured fetal mouse testis. Poster Presentation. American Society of Andrology XXV North American Testis Workshop, Chicago, IL, 3-6 April 2019.
20. **Spade, D.J.**, Hall, S.J. Interaction between mono-(2-ethylhexyl) phthalate and all-trans retinoic acid alters development of *ex vivo* cultured fetal mouse testis. Poster Presentation. Society of Toxicology 58<sup>th</sup> Annual Meeting, Baltimore, MD, 10-14 March 2019.
21. **Spade, D.J.**, Hall, S.J., Wortzel, J.D., Reyes, G., Boekelheide, K. Mono-(2-ethylhexyl) phthalate disrupts retinoic acid signaling and gonadal sex determination pathways in *ex vivo* cultured rat and mouse fetal testes. Platform Presentation. Society of Toxicology 57<sup>th</sup> Annual Meeting, San Antonio, TX, 11-15 March 2018.
22. **Spade, D.J.**, Wortzel, J.D., Hall, S.J., Reyes, G., Boekelheide, K. Mono-(2-ethylhexyl) phthalate and all-trans retinoic acid interactions modulate development of rat fetal testis *in vitro*. Platform Presentation. Society of Toxicology 56<sup>th</sup> Annual Meeting, Baltimore, MD, 12-16 March 2017.
23. **Spade, D.J.**, Wortzel, J.D., Hall, S.J., Reyes, G., Boekelheide, K. Interaction between mono-(2-ethylhexyl) phthalate and all-trans retinoic acid in rat fetal testis *in vitro*. Poster Presentation. NIEHS Environmental Health Science FEST, Durham, NC, 5-8 December 2016.
24. **Spade, D.J.**, Hall, S.J., Boekelheide, K. Timing of rat fetal testis seminiferous cord effects following late gestation di-*n*-butyl phthalate exposure. Poster Presentation. Society of Toxicology 54<sup>th</sup> Annual Meeting, San Diego, CA, 22-26 March 2015.
25. **Spade, D.J.**, Boekelheide, K. Differences in anti-androgenic response to phthalates in human, rat, and mouse fetal testis model systems. Interactive Platform Presentation. Society of Environmental Toxicology and Chemistry 35<sup>th</sup> Annual Meeting, Vancouver, BC, Canada, 9-13 November 2014.
26. Boekelheide, K., **Spade, D.J.** Response of human fetal testis xenotransplants to environmental toxicants: implications for risk assessment. Platform Presentation in the symposium titled, "Innovations in Male Environmental Health Protection." American Society of Andrology 39<sup>th</sup> Annual Meeting, Atlanta, GA, 5-8 April 2014.
27. **Spade, D.J.**, Dai, M.S., Hall, S.J., Boekelheide, K. Seminiferous tubule atrophy occurs regardless of x-ray exposure in the p53-null rat testis. Poster Presentation. Society of Toxicology 53<sup>rd</sup> Annual Meeting, Phoenix, AZ, 23-27 March 2014.
28. **Spade, D.J.**, Heger, N., Huse, S., Hall, S.J., Boekelheide, K. Differential anti-androgenic effects of abiraterone acetate and di-*n*-butyl phthalate in human fetal testis. Platform Presentation. Gordon Research Seminar on "Cellular & Molecular Mechanisms of Toxicity." Andover, NH, 10-11 August 2013.
29. **Spade, D.J.**, Heger, N., Huse, S., Hall, S.J., Boekelheide, K. Differential anti-androgenic effects of abiraterone acetate and di-*n*-butyl phthalate in human fetal testis. Poster Presentation. Gordon Research Conference on "Cellular & Molecular Mechanisms of Toxicity." Andover, NH, 12-16 August 2013.

30. **Spade, D.J.**, Heger, N., Hall, S., Boekelheide, K. Assessing the antiandrogenic effects of *in utero* exposure to dibutyl phthalate and other xenobiotics. Platform Presentation in the Symposium titled, "Role of Systems Biology in Characterizing Risk of Developmental Origins of Disease." Society of Toxicology 52<sup>nd</sup> Annual Meeting, San Antonio, TX, 10-14 March 2013.
31. **Spade, D.J.**, Brown-Peterson, N.J., Glazer, R.A., Barber, D.S., Denslow, N.D. Elevated zinc in the digestive gland of reproductive deficient queen conchs (*Strombus gigas*) from nearshore aggregations in the Florida Keys, FL, USA. Platform Presentation. Pollutant Responses in Marine Organisms 16, Long Beach, CA, 15-18 May 2011.
32. **Spade, D.J.**, Feswick, A., Glazer, R.A., Barber, D.S., Denslow, N.D. Queen conch (*Strombus gigas*) reproductive dysfunction in nearshore areas of the Florida Keys – a possible link to Cu and Zn. Poster Presentation. Society of Toxicology 50<sup>th</sup> Annual Meeting, Washington, DC, 6-10 March 2011.
33. Denslow, N.D., Martyniuk, C.J., Kroll, K.J., Doperalski, N., **Spade, D.J.**, Feswick, A.M., Prucha, M., Weil, R., Barber, D.S. Contamination of the north shore of Lake Apopka with organochlorine pesticides. Superfund Research Program Annual Meeting, Portland, OR, 10-11 November 2010.
34. Martyniuk, C.J., **Spade, D.J.**, Doperalski, N.J., Kroll, K.J., Blum, J., Feswick, A., Prucha, M.S., Weil, R., Barber, D. S., Denslow, N. D. Probing genomic mechanisms of estrogenic and antiandrogenic effects of organochlorine pesticides in largemouth bass. Society of Environmental Toxicology and Chemistry 31<sup>st</sup> Annual Meeting, Portland, OR, November 7-11, 2010.
35. Martyniuk, C.J., Doperalski, N.J., Feswick, A.M., Kroll, K.J., **Spade, D.J.**, Barber, D.S., Denslow, N.D. Omics and cell signaling cascades in the teleost brain: Implications for pesticide exposures and neurodegeneration. Platform Presentation. 37<sup>th</sup> Aquatic Toxicity Workshop, Toronto, Ontario, Canada, 3-6 October 2010.
36. **Spade, D.J.**, Feswick, A., Brown-Peterson, N., Glazer, R., Barber, D., Denslow, N. Testis transcriptome of queen conch (*Strombus gigas*) failing to reproduce in the Florida Keys, Florida, USA. Poster Presentation. Society of Environmental Toxicology and Chemistry Europe 20<sup>th</sup> Annual Meeting, Seville, Spain, 23-27 May 2010.
37. Hecker, M., Kramer, V.J., Etterson, M.A., Murphy, C.A., Roesijadi, G., **Spade, D.J.**, Spromberg, J.A., Wang, M., Ankley, G.T. Adverse outcome pathways and ecological risk assessment: bridging to population-level effects. Platform Presentation. Society of Environmental Toxicology and Chemistry Europe 20<sup>th</sup> Annual Meeting, Seville, Spain, 23-27 May 2010.
38. Denslow, N., Martyniuk, C., Garcia-Reyero, N., Kroll, K., Doperalski, N., **Spade, D.**, Feswick, A., Prucha, M., Weil, R., Barber, D. Expression profiling of largemouth bass (*Micropterus salmoides*) exposed to a mixture of organochlorine pesticides in the region of Lake Apopka, Florida, USA. Platform Presentation. Society of Environmental Toxicology and Chemistry Europe 20<sup>th</sup> Annual Meeting, Seville, Spain, 23-27 May 2010.
39. Ankley, G., Etterson, M., Hecker, M., Kramer, V., Murphy, C., **Spade, D.**, Spromberg, J., Roesijadi, G., Wang, M. Adverse outcome pathways and ecological risk assessment: bridging to population-level effects. Platform Presentation. Society of Toxicology 49<sup>th</sup> Annual Meeting, Salt Lake City, Utah, 7-11 March 2010.
40. Denslow, N.D., Martyniuk, C.J., Kroll, K.J., Doperalski, N.J., **Spade, D.J.**, Feswick, A.M., Prucha, M.S., Weil, R.R., Barber, D.S. Poster. The effects of organochlorine pesticide exposure in largemouth bass. Platform Presentation. NIEHS Superfund Research Program Annual Meeting, New York, NY, December 2009.
41. **Spade, D.J.**, Feswick, A., Barber, D.S., and Denslow, N.D. Linking Cu and Zn bioaccumulation to reproductive failure in queen conch (*Strombus gigas*) through transcriptomics. Platform presentation. Society of Environmental Toxicology and Chemistry North America 30<sup>th</sup> Annual Meeting, New Orleans, LA, 20 November 2009.
42. Martyniuk, C., Feswick, A., Kroll, K., Doperalski, N.J., **Spade, D.J.**, Barber, D., Denslow, N.D. Platform presentation. Genomic and Proteomic Evidence Suggests Dieldrin Results in Neurotoxicity in the

Teleostean Hypothalamus. Platform Presentation. Society of Environmental Toxicology and Chemistry North America 30<sup>th</sup> Annual Meeting, New Orleans, LA, 19-23 November 2009.

43. Ankley, G., Etterson, M., Hecker, M., Kramer, V., Murphy, C., **Spade, D.**, Spromberg, J., Roesijadi, G., Wang, M. Adverse outcome pathways and ecological risk assessment: bridging to population-level effects. Society of Environmental Toxicology and Chemistry North America 30<sup>th</sup> Annual Meeting, New Orleans, LA, 19-23 November 2009.
44. **Spade, D.J.**, R.J. Griffitt, N.J. Brown-Peterson, L. Liu, R. Glazer, A., McClellan-Green, P., Barber, D.S., and Denslow, N.D. Genomic Response to Reproductive Stress in Neuroganglia and Testis of Queen Conch (*Strombus gigas*). Platform Presentation. Society of Environmental Toxicology and Chemistry North America Annual Meeting, Tampa, FL, 16-20 November 2008.

### Regional Chapter Meetings/University Symposia

45. Guang, A., Pu, Y., Stermer, A.R., Hall, S.J., Avellino, G., Wu, Z., Gadson, A., Mensah, V. Sigman, M., **Spade, D.J.** Sperm RNAs in Male Fertility and Reproductive Toxicity of Ethylene Glycol Monomethyl Ether. Poster Presentation. Rhode Island IDEa Symposium, Providence, RI, 1 June 2023.
46. Solano, A.E., Alhasnani, M.A., Hall, S.J., **Spade, D.J.** The impact of retinoic acid and mono-(2-ethylhexyl) phthalate on mouse fetal testis germ cell population. Poster Presentation. Northeast Chapter of Society of Toxicology Annual Meeting, Boston, MA, 21 October 2022.
47. Gupta, M., Conley, J.M., Lambright, C., Gray, L.E., **Spade, D.J.** Low dose threshold for adverse effects of dipentyl phthalate on rat fetal testicular germ cells in late gestation. Poster Presentation. Northeast Chapter of Society of Toxicology Annual Meeting, Boston, MA, 21 October 2022.
48. Bell, S., Zsom, A., **Spade, D.J.** Identifying a rare cell type in histological sections using neural networks. Platform Presentation. Center for Computation and Visualization Conference. Brown University, Providence, RI, 30 October 2019.
49. Ephrem, R., Hall, S.J., **Spade, D.J.** Induction of STRA8 by all-trans retinoic acid differs between ex vivo cultured mouse and rat fetal testes. Poster Presentation. Northeast Chapter of Society of Toxicology Annual Meeting, Cambridge, MA, 25 October 2019.
50. Loeb, S.A., Caruolo, Z.J., Hall, S.J., **Spade, D.J.** Combined retinoic acid and mono-(2-ethylhexyl) phthalate exposure induces FOXL2 expression in ex vivo cultured fetal mouse testis. Poster Presentation. Northeast Chapter of Society of Toxicology Annual Meeting, Cambridge, MA, 25 October 2019.
51. **Spade, D.J.**, Wilson, S., Hall, S.J., Boekelheide, K. Timing of rat fetal testis seminiferous cord effects following late gestation di-*n*-butyl phthalate exposure. Poster Presentation. Institute at Brown for Environment and Society: Earth, Itself 2015 Convention, Providence, RI, 23-24 April 2015.
52. Dai, M.S., **Spade, D.J.**, Hall, S.J., Boekelheide, K. Tp53 knockout rat exhibits impaired spermatogenesis and seminiferous tubule atrophy. Poster Presentation. Northeast Chapter of Society of Toxicology Annual Meeting, Cambridge, MA, 27 September 2013.
53. **Spade, D. J.**, Project 2: Mechanisms of human fetal testis susceptibility to anti-androgens. Platform Presentation. Brown University Formative Children's Environmental Health Center Retreat. Providence, RI. 11 December 2012.
54. **Spade, D.J.**, Feswick, A., Barber, D.S., and Denslow, N.D. Transcriptomics of queen conch (*Strombus gigas*) testis in the Florida Keys: possible role of metals in reproductive failure. Poster Presentation. University of Florida Genetics Symposium, Gainesville, FL, 28-29 October 2009.
55. **Spade, D.J.**, Griffitt, R.J., Liu, L., Kroll, K.J., Glazer, R.A., Brown-Peterson, N.J., Barber, D.S., Denslow, N.D. Toxicogenomic Investigation of Reproductive Failure in South Florida Queen Conch. Platform Presentation. Southeastern Regional Chapter of the Society for Environmental Toxicology and Chemistry Annual Meeting, Gainesville, FL, 31 May 2008.