Updated: May 12, 2025

CURRICULUM VITAE

DANIEL J. SPADE, PH.D.

PERSONAL INFORMATION

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

Business Telephone: 401-863-5726

E-mail Address: Daniel_Spade@brown.edu

PROFESSIONAL APPOINTMENTS

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

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

EDUCATION

Ph.D., Veterinary Medical Sciences, Toxicology concentration 2007 – 2011
University of Florida, Gainesville, FL, Advisor: Nancy Denslow
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 2003 – 2007
The Pennsylvania State University, University Park, PA

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

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 21st 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. *Revised manuscript under review*.

Peer-Reviewed Publications

1. Xi, Q., Ji, H., Bianchi, E., Hall, S.J., Avellino, G., Berg, W., Bearelly, P., Sigman, M., Wu, Z., & **Spade, D.J.** Downregulation of spermatogenesis-associated transcripts in the sperm of idiopathic infertile men. Andrology. *Online ahead of print*, 10 May, 2025. PMID: 40346865. doi: 10.1111/andr.70060.
2. 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. PMCID: PMC9520016. doi: 10.1016/j.crtox.2022.100087.

3. Li, H. & **Spade, D.J.** (2021). Environmental exposures, fetal testis development and function: phthalates and beyond. Reproduction, 162(5), F147-F167. PMCID: PMC8497445. doi: 10.1530/REP-20-0592. *Review.*

4. Bell, S., Zsom, A., Conley, J. & **Spade, D.J.** (2020). Automated identification of multinucleated germ cells with U-Net. PLoS One, 15(7), e0229967. PMCID: PMC7347116. doi: 10.1371/journal.pone.0229967.

5. **Spade, D.J.**, Hall, S.J., Wortzel, J.D.[ug], Reyes, G.[ug] & 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. PMCID: PMC6390659. doi: 10.1093/toxsci/kfy283.

6. **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. PMCID: PMC6358251. doi: 10.1093/toxsci/kfy260.

7. 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. PMCID: PMC6412024. doi: 10.1016/j.taap.2018.03.021.

8. **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. PMCID: PMC5921076. doi: 10.1016/j.toxlet.2018.03.018.

9. 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. PMCID: PMC5673550. doi: 10.1111/andr.12409. **Cover article**.

10. 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.

11. **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. PMCID: PMC4712002. doi: 10.1095/biolreprod.115.131615.

12. **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. PMCID: PMC4526820. doi: 10.1002/bdrb.21131. *Review.* **Cover article**.

13. **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. PMCID: PMC3930360. doi: 10.1093/toxsci/kft266.

14. 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. PMCID: PMC4306740. doi: 10.1002/pros.22713.

15. 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. PMCID: PMC4349561. doi: 10.1016/j.ygcen.2013.06.008.

16. 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.

17. 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.

18. 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. PMCID: PMC3336092. doi: 10.3389/fgene.2012.00062. *Review*.

19. **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.

20. 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. PMCID: PMC3222593. doi: 10.1016/j.aquatox.2010.12.002.

21. 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*.

22. **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. PMCID: PMC2939879. doi: 10.1371/journal.pone.0012737.

23. 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. PMCID: 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

2025 Session Chair, “DARTing Toward Understanding Modes of Toxicity,” Society of Toxicology Annual Meeting

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 = 81 total)

2020 – 25 *Andrology*

2025 *Toxicology*

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 – 23 *Reproduction*

2024 *BMC Biology*

2024 *Endangered Species Research*

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 *American Journal of Reproductive Immunology*

2021 – 22 *BMC Medicine*

2022 *Current Research in Toxicology*

2022 *PNAS Nexus*

2022 *Food and Chemical Toxicology*

2021 *Toxicology*

2021 *Environmental Epidemiology*

2021 *Environmental Epigenetics*

2020 *PeerJ*

2020 *Scientific Reports*

2019 – 20 *Reproductive Toxicology*

2019 *Environment International*

2018 *PLOS ONE*

2018 *Environmental Pollution*

2017 *Environmental and Molecular Mutagenesis*

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," 2025 March 3. *In Vitro* Models for Disease (BIOL 2167), Brown University, Course Instructor: Jacqueline Schell
2. "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
3. "Toxicology and Toxicity Testing," 2023 February 13. *In Vitro* Models for Disease (BIOL 2167), Brown University, Course Instructor: Jacqueline Schell
4. "Male Reproductive Toxicology," 2022 April 12, Environmental Health and Disease (BIOL 1820), Brown University, Course instructor: Jessica Plavicki
5. "Toxicity Testing Past, Present, and Future," 2022 February 8, *In Vitro* Models for Disease (BIOL 2167), Brown University, Course Instructor: Jacqueline Schell
6. "Reproductive Organ Toxicity," 2014 March 19, Environmental Health and Disease (BIOL 1820), Brown University, Course instructor: Tatiana Johnston
7. "Toxicology Basics," 2013 March 4, Environmental Technologies and Human Health (ENG 2920D), Brown University, Course instructor: James Rice
8. "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 Vaishnava

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

2024 – Benson Zou, Brown University

2023 – Cindy Su, Brown University

2023 – Darren Chen, Brown University
UTRA Award, “Development of whole mount imaging methods for late gestation fetal rat testes”

2023 – 24 Toni Johnson, Brown University
Independent Study, “Effects of in Utero Dipentyl Phthalate Exposure on Later Life Testis Function”

2023 – 24 Saira Moazzam, Brown University
Independent Study, “Evaluating FDA Labeling Practices for Drugs with Male Reproductive Toxicity”

2023 – 24 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 Durandeau, 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. Dose-dependent germ cell toxicity of a low-dose phthalate mixture. Seminar. Developmental & Regenerative Sciences Seminar Series, University of Texas at San Antonio. 17 February 2025.
2. Sperm RNAs in male reproductive toxicology and infertility. Seminar. Department of Physiological Sciences, University of Florida College of Veterinary Medicine. 12 September 2023.
3. 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.
4. Fetal testis patterning and the roads to phthalate syndrome. Seminar. Department of Environmental Health Science, University of Massachusetts Amherst. 21 April 2021. Virtual.
5. 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

6. Zhao, Z., Su, C., Hall, S.J., and **Spade, D.J.** Dose-Dependent Germ Cell Toxicity of a Nine-Phthalate Mixture. Poster presentation. Society of Toxicology 64th Annual Meeting, Orlando, FL, 16-20 March, 2025.
7. **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.
8. **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.
9. **Spade, D.J.** Mouse and Rat Models to Address Gaps in Fetal Testicular Phthalate Toxicity. Symposium Presentation (Invited). American Society of Andrology 48th Annual Meeting, Boston, MA, 19-23 April, 2023.
10. **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 62nd Annual Meeting, Nashville, TN, 19-23 March, 2023.
11. 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 62nd Annual Meeting, Nashville, TN, 19-23 March, 2023.
12. **Spade, D.J.**, Avellino, G., Berg, W., Bearelly, 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 47th Annual Meeting, La Jolla, CA, 7-10 May, 2022.
13. 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 61st Annual Meeting, San Diego, CA, 27-31 March, 2022.
14. **Spade, D.J.** Disruption of retinoic acid signaling: a mechanism of phthalate toxicity in the seminiferous cord. Symposium Presentation. Society of Toxicology 60th Annual Meeting, Virtual Event, 12-26 March 2021.

15. 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 60th Annual Meeting, Virtual Event, 12-26 March 2021.

16. 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 60th Annual Meeting, Virtual Event, 12-26 March 2021.

17. 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.

18. 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 59th Annual Meeting, Anaheim, CA, 15-19 March 2020. *Meeting Cancelled*.

19. **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 59th Annual Meeting, Anaheim, CA, 15-19 March 2020. *Meeting Cancelled*.

20. 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.

21. **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.

22. **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 58th Annual Meeting, Baltimore, MD, 10-14 March 2019.

23. **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 57th Annual Meeting, San Antonio, TX, 11-15 March 2018.

24. **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 56th Annual Meeting, Baltimore, MD, 12-16 March 2017.

25. **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.

26. **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 54th Annual Meeting, San Diego, CA, 22-26 March 2015.

27. **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 35th Annual Meeting, Vancouver, BC, Canada, 9-13 November 2014.

28. 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 39th Annual Meeting, Atlanta, GA, 5-8 April 2014.

29. **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 53rd Annual Meeting, Phoenix, AZ, 23-27 March 2014.

30. **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.

31. **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.

32. **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 52nd Annual Meeting, San Antonio, TX, 10-14 March 2013.

33. **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.

34. **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 50th Annual Meeting, Washington, DC, 6-10 March 2011.

35. 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.

36. 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 31st Annual Meeting, Portland, OR, November 7-11, 2010.

37. 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. 37th Aquatic Toxicity Workshop, Toronto, Ontario, Canada, 3-6 October 2010.

38. **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 20th Annual Meeting, Seville, Spain, 23-27 May 2010.

39. 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 20th Annual Meeting, Seville, Spain, 23-27 May 2010.

40. 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 20th Annual Meeting, Seville, Spain, 23-27 May 2010.

41. 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 49th Annual Meeting, Salt Lake City, Utah, 7-11 March 2010.

42. 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.

43. **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 30th Annual Meeting, New Orleans, LA, 20 November 2009.

44. 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 30th Annual Meeting, New Orleans, LA, 19-23 November 2009.

45. 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 30th Annual Meeting, New Orleans, LA, 19-23 November 2009.

46. **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

47. 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.

48. 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.

49. 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.

50. 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.

51. 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.

52. 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.

53. **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.

54. 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.

55. **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.

56. **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.

57. **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.