PHILLIP LUKE DAVIDSON

e-mail: phidavid@iu.edu
website: phillipdavidson.github.io
phone: (901) 335-3212

Department of Biology
Indiana University
Bloomington, IN 47405

EDUCATION

2016-2021	Doctor of Philosophy, Biology	Duke University
2013-2016	Bachelor of Science, Biology	University of Miami

POSITIONS

2024-pres.	Postdoctoral Associate	Indiana University
2022-2024	NSF Postdoctoral Fellow in Biology	Indiana University
2021-2022	Postdoctoral Associate	Indiana University
2013-2016	Research Associate	University of Miami

Starting Fall 2025	Assistant Professor, Dept. of Biological Sciences	Mississippi State University

PUBLICATIONS

In review

Nadolski, EM, **Davidson, PL,** Jones, JA, Westwick, RR, Moczek, AP. Insects in their environments: eco-devo and evo-devo perspectives. In *Comprehensive Molecular Insect Science* (2nd Ed.)

2024

Davidson, PL, Moczek, AP. Genome evolution and divergence in *cis*-regulatory architecture is associated with condition-responsive development in horned dung beetles. ***PLoS Genetics.*** 20(3): e1011165. Link

Harry CJ*, Hibshman JD*, Damatac A, **Davidson PL**, Estermann MA, Flores-Flores M, Holmes CM, Lázaro J, Legere EA, Leyhr J, Thendral SB, Vincent BA, Goldstein B. Protocol for fluorescent live-cell staining of tardigrades. ***STAR Protocols*** 5:103232. Link

2023

Davidson, PL*, Nadolski, EM*, Moczek, AP. Gene regulatory networks underlying the development and evolution of plasticity in horned beetles. ***Current Opinion in Insect Science.*** 60:101114. Link

Devens, HR, **Davidson, PL,** Byrne, M, Wray, GA. Hybrid epigenomes reveal extensive local genetic changes to chromatin accessibility that contribute to divergence in embryonic gene expression between species. ***Molecular Biology & Evolution***. 40:msad222. Link

Davidson, PL, Lessios, HA, Wray, GA, McMillan, WO, Prada, C. High quality genome assembly of the sea urchin *Echinometra lucunter*, a model for speciation in the sea. ***Genome Biology & Evolution***. 15:evad093. Link

2022 Davidson, PL, Guo, H, Swart, JS, Massri, AJ, Edgar, A, Wang, L, Berrio, A, Devens, HR, Zhang, H, Chang, Y, Byrne, M, Fan, G, Wray, GA. Recent reconfiguration of an ancient developmental gene regulatory network in *Heliocidaris* sea urchins. ***Nature Ecology & Evolution***. 6:1907–1920. Link

Davidson, PL, Byrne, M, Wray, GA. Evolutionary changes in the chromatin landscape contribute to reorganization of a developmental gene regulatory network during rapid life history divergence in sea urchins. ***Molecular Biology & Evolution***. 39:msac172. Link

Ketchum, RN, Davidson, PL, Smith EG, Wray, GA, Burt, JA, Ryan, JF, Reitzel, AM. Chromosome-level genome assembly of the highly heterozygous sea urchin *Echinometra* sp. EZ. ***Genome Biology & Evolution.*** 14:evac144. Link

2021 Song, H*, Guo*, X*, Sun, L*, Wang, Q*, Han, F. Wang, H, Wray, GA, Davidson, PL, Wang, Q, Hu, Z, Zhou, C, Yu, Z, Yang, M, Feng, J, Shi, P, Zhou, Y, Zhang, L, Zhang, T. Hard clam genome reveals massive expansion and diversification of inhibitors of apoptosis underlying stress adaptation. ***BMC Biology.*** 19,15. Link

Byrne, M, Koop, D, Strbenac, D, Cisternas, P, Yang, JWH, Davidson, PL, Wray, GA. Transcriptomic analysis of Nodal- and BMP-associated genes during development to the juvenile sea star in *Parvulastra exigua* (Asterinidae). ***Marine Genomics.*** 59:100857. Link

2020 Davidson, PL*, Guo, H*, Wang, L, Berrio, A, Zhang, H, Chang, Y, Soborowski, AL, McClay, DR, Fan, G, Wray, GA. Chromosomal-Level genome assembly of the sea urchin *Lytechinus variegatus* substantially improves functional genomic analyses. ***Genome Biology & Evolution.*** 12:1080–1086. Link

Davidson, PL*, Devens, HR*, Deaker, DJ, Smith, KE, Wray, GA, Byrne, M. Ocean acidification induces distinct transcriptomic responses across life history stages of the sea urchin *Heliocidaris erythrogramma*. ***Molecular Ecology.*** 29: 4618-4636. Link

Byrne, M, Koop, D, Strbenac, D, Cisternas, Paula, Balogh, R, Yang, JYH, Davidson, PL, Wray, GA. Transcriptomic analysis of sea star development through metamorphosis to the highly derived pentameral body plan with a focus on neural transcription factors. ***DNA Research.*** 27: dsaa007. Link

2019 Davidson, PL, Thompson, JW, Foster, MW, Moseley, MA, Byrne, M, Wray, GA. A comparative analysis of egg provisioning using mass spectrometry during rapid life history evolution in sea urchins. ***Evolution & Development.*** 21:188-204. Link

2017 Davidson, PL, Koch, BJ, Schnitzler, CE, Henry, JQ, Martindale, MQ, Baxevanis, AD, Browne, WE. The maternal-zygotic transition and zygotic activation of *Mnemiopsis leidyi* genome occurs within the first three cell cycles. ***Molecular Reproduction & Development.*** 84:1218-1229. (Cover feature) Link

*equal contribution

FELLOWSHIPS AND AWARDS

2022-2024	NSF Postdoctoral Fellowship in Biology	$138,000
2019,2022	Developmental Biology of the Sea Urchin Travel Award	sum: $1,300

2019	Duke University Graduate Travel Award	$500
2018	Duke Biology Grant-in-Aid Award	$1,000
2015	U of Miami Institute for Data Science and Computing Fellowship	$500
2015	Beyond the Book Summer Research Scholarship	$4,000
2013-2016	President's Scholarship, Gables Scholarship, Foote Fellowship	NA

TEACHING

Instructor

2019	Marine Research in the Gulf of Mexico, Field Course	Duke TIP

Teaching Assistant

2020	Molecular Biology, Lab (3 sections)	Duke University
2019	Genetics and Evolution, Lab (2 sections)	Duke University
2015	Introduction to Marine Biology, Lecture and Lab	University of Miami

Guest Lecturer

2022	Introduction to Differential Gene Expression in R	Indiana University

PRESENTATIONS

2024	European Society for Evolutionary Developmental Biology University of Helsinki, Helsinki, Finland	Invited Speaker
	Biological Sciences Departmental Seminar Mississippi State University, Starkville, MS, USA	Invited Speaker
	Biological Sciences Departmental Seminar Florida State University, Tallahassee, FL, USA	Invited Speaker
2023	Ecology and Evolutionary Biology Brown Bag Seminar Indiana University, Bloomington, IN, USA	Invited Speaker
	Embryology 130th Anniversary Symposium Marine Biological Laboratory, Woods Hole, MA, USA	Poster
	Ecology and Evolutionary Biology Departmental Seminar University of Kansas, Lawrence, KS, USA	Invited Speaker
2022	Evolution and Core Processes in Gene Expression Stower's Institute, Kansas City, KS, USA	Invited Speaker
	Evolution of Networks in Changing Worlds (Symposium) University College London, London, UK	Invited Speaker
	Developmental Biology of the Sea Urchin XXVI Marine Biological Laboratory, Woods Hole, MA, USA	Invited Speaker
2021	Ecology and Evolutionary Biology Brown Bag Seminar Indiana University, Bloomington, IN, USA	Invited Speaker
2019	Pan-Am Society for Evolutionary Developmental Biology University of Miami, Coral Gables, FL, USA	Poster
2018	Developmental Biology of the Sea Urchin XXV Marine Biological Laboratory, Woods Hole, MA, USA	Invited Speaker
	Developmental and Stem Cell Biology Seminar Series University of North Carolina, Chapel Hill, NC, USA	Invited Speaker

2016	Undergraduate Research, Creativity, and Innovation Forum University of Miami, Coral Gables, FL, USA	Poster

SOCIETY MEMBERSHIPS

Society for Developmental Biology (SDB)
Society for the Study of Evolution (SSE)
Pan-American Society for Evolutionary-Developmental Biology (PASEDB)

PROFESSIONAL DEVELOPMENT

2023	Marine Biological Laboratory Embryology Course (3 weeks)
2022	Translating Science: Connecting the Next Generation Scientist with K12 Educators

MENTORSHIP

2023-pres.	Isabel Manley, Undergraduate, Indiana University: Honor's Thesis *"Function and evolution of BMP signaling in beetle horn development and diversification"*
2022	Suki Gill, Undergraduate, Indiana University: GROUPs Research Scholar *"Evolution of the Hox gene cluster in Coleoptera"*

OUTREACH AND SERVICE

2022, 2024	Bug Fest Educator Science event for local community focused on insect education.	Bloomington, IN
2022	IU GROUPs Scholars Program Intensive summer-long DEI program for 1st generation and underrepresented incoming college students. Mentored research project on "Hox gene evolution in Coleoptera".	Bloomington, IN
2021-pres.	Moczek Lab Outreach Initiative Teaching and developing science education modules for local high schools.	Bloomington, IN
2021	Science Fest Educator Local science education event for K-12	Bloomington, IN
2017-2018	Co-Chair, Duke Biology Graduate Steering Committee	Durham, NC
2015-2016	UConnect Research Mentor Peer-mentor program for increasing accessibility of undergraduate research opportunities	Coral Gables, FL

REFERENCES

Armin Moczek, Ph.D.	armin@indiana.edu	Postdoctoral Advisor
Greg Wray, Ph.D.	gwray@duke.edu	Doctoral Adviser
Maria Byrne, Ph.D.	maria.byrne@sydney.edu.au	Collaborator