PHILLIP LUKE DAVIDSON

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Department of Biology
Indiana University
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EDUCATION

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

POSITIONS

2022-present	NSF Postdoctoral Fellow in Biology	Indiana University
2021-2022	Postdoctoral Associate	Indiana University
2013-2016	Research Scientist	University of Miami

PUBLICATIONS

in review

Davidson, PL, Moczek, AP. Genome evolution and divergence in *cis*-regulatory architecture underlie condition-responsive development in horned dung beetles.

Davidson, PL*, Nadolski, EM*, Moczek, AP. Gene regulatory networks underlying the development and evolution of plasticity in horned beetles.

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. bioRxiv

2023

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***. *Accepted, in press*.

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

PROFESSIONAL DEVELOPMENT

2023	Marine Biological Laboratory Embryology Course (6 weeks)
2022	Translating Science: Connecting the Next Generation Scientist with K12 Educators (3 months)

MENTORSHIP

2023-pres.	Isabel Manley, Undergraduate, Indiana University "Function and Evolution of *Twist* in Beetle Horn Development and Diversification"
2022	Suki Gill, Undergraduate, Indiana University "Evolution of Hox Gene Cluster in Coleoptera"

PRESENTATIONS

2023	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	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	Speaker
	Developmental and Stem Cell Biology (Seminar Series) University of North Carolina, Chapel Hill, NC, USA	Speaker
2016	Undergraduate Research, Creativity, and Innovation Forum University of Miami, Coral Gables, FL, USA	Poster

OUTREACH AND SERVICE

2022	Bug Fest Educator Science event for local community focused on insect education.	Bloomington, IN
2022	IU GROUPs Scholars Program Intensive summer research program for 1st gen. 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

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