

Jacob M. Daane, PhD

University of Houston
Department of Biology and Biochemistry | Houston, TX 77204
email: jdaane@uh.edu | website: daanelab.org

Professional Appointments

-
- Assistant Professor of Biology and Biochemistry, University of Houston. Houston, TX 2022-present

Education

-
- PhD, Biological and Biomedical Sciences, Harvard University 2016
 - BS, Molecular Biology, University of Wisconsin-Madison 2010

Training

-
- Associate Research Scientist, Northeastern University Marine Science Center. Nahant, MA 2020-2021
Advisor: Dr. Bill Detrich
Research: Comparative genomics in fishes and zebrafish developmental genetics
 - Postdoctoral Researcher, Northeastern University Marine Science Center. Nahant, MA 2016-2020
Advisor: Dr. Bill Detrich
Research: Evolutionary medicine, adaptive radiation, and fish comparative genomics
 - PhD Student, Harvard University. Cambridge, MA 2010-2016
Advisor: Dr. Matthew Harris
Research: Genetics of proportional growth in the zebrafish fin and genomic approaches toward understanding natural variation in non-model systems
 - Research Assistant, University of Wisconsin-Madison. Madison, WI 2006-2010
Advisor: Dr. Karen Downs
Research: Development and patterning of the mouse umbilical cord

Research Grants

-
- Daane JM** (PI). NIH 1R35GM150590-01. 2023-2028
Phylogenomic mechanisms of trait evolution and resilience to disease.
Total funding: \$1,937,500 2024-2027
 - Gerringer M (PI), **Daane JM** (co-PI). NSF 2407552.
Collaborative Research: RUI: Pressure Adaptation, Stress, and Convergent Evolution in Fishes Across Habitat Depth.
Total funding (UH Award): \$432,357
 - Daane JM** (PI) and Detrich HW III (co-PI, Northeastern University). NSF 1955368/2324998. 2020-2024
ANT LIA: Collaborative Research: Evolutionary Patterns and Mechanisms of Trait Diversification in the Antarctic Notothenioid Radiation.
Total funding: \$1,141,450.
 - Daane JM** and Treaster S. Harvard Medical School Fund for Genetics of Climate Change 2019
Total funding: \$100,000
 - Daane JM**. NSF Doctoral Dissertation Improvement Grant (DEB-1407092) 2014
Total Funding: \$13,000

Pending Research Grants

Fellowships

- American Heart Association Postdoctoral Fellowship (17POST33660801), \$103,300 2017-2019
- National Science Foundation Graduate Research Fellowship, \$132,000 2012-2015
- UW-Madison Hilldale Undergraduate Research Fellowship, \$4,000 2008

Honors & Awards

- Barry M. Goldwater Scholar, \$7,500 2009
- UW-Madison Bookstore Award for senior honors thesis, \$1,000 2009

Publications

- Chau KD, Hauser FE, **Daane JM**, Harris MP, Chang BSW and NR Lovejoy. (2024). Multiple Ecological Axes Drive Molecular Evolution of Cone Opsins in Beloniform Fishes. *Journal of Molecular Evolution*. 92(2):93-103
- Treaster S, Deelen J, **Daane JM**, Murabito J, Karasik D and MP Harris. (2023). Convergent genomics of longevity in rockfishes highlights the genetics of human life span variation. *Science Advances* 9:eadd2743.
- Olivares-Zambano D, **Daane JM**, Hyde J, Sandel M and A Aguilar. (2022). Speciation genomics and the role of depth in the divergence of rockfishes (*Sebastes*) revealed through Pool-seq analysis of enriched sequences. *Ecology and Evolution*. 12:e9341.
- Daane JM** and Detrich HW III. Adaptations and Diversity of Antarctic Fishes: A Genomic Perspective. (2022). *Annual Review of Animal Biosciences*. 10:39-62.
- Daane JM**, Blum, N, Lanni J, Boldt H, Iovine MK, Higdon S, Johnson SL, Lovejoy NR and Harris MP. Modulation of bioelectric cues in the evolution of flying fishes. (2021). *Current Biology* 31(22):5052-5061.
- Treaster S, **Daane JM** and Harris MP. Refining Convergent Rate Analysis with Topology in Mammalian Longevity and Marine Transitions. (2021). *Molecular Biology and Evolution*. 38(11):5190–5203.
- Daane JM**, Auvinet J, Stoebeu A, Yergeau D, Harris MP and Detrich HW III. Developmental constraint shaped genome evolution and erythrocyte loss in Antarctic fishes following paleoclimate change. (2020). *PLoS Genetics*. 16(10):e1009173.
- Harris MP, **Daane JM**, Lanni J. Veiled mirrors: fish fins giving insight into size regulation. (2020). *Wiley Interdisciplinary Reviews: Developmental Biology* e381
- Li C, Barton C, Henke K, **Daane JM**, Caetano-Lopes J, Tanguay R and Harris MP. Celsr1a is essential for tissue homeostasis and onset of aging phenotypes in the zebrafish. (2020). *eLife* 9:e50523.
- Daane JM**, Giordano D, Coppola D, di Prisco G, Detrich HW III and Verde C. Adaptations to environmental change: globin superfamily evolution in Antarctic fishes. (2019). *Marine Genomics* 49:100724.

- **Daane JM**, Dornburg A, Smits P, MacGuigan D, Hawkins B, Near TJ, Detrich HW III* and Harris MP*. (2019) Historical contingency shapes adaptive radiation in Antarctic fishes. *Nature Ecology & Evolution* 3: 1102-1109.
- **Daane JM**, Lanni J, Rothenberg I, Seebohm G, Higdon CW, Johnson SL and Harris MP. (2018). Bioelectric-calcineurin signaling module regulates allometric growth and size of the zebrafish fin. *Scientific Reports* 8:10391.
- Henke K, **Daane JM**, Hawkins MB, Dooley CM, Busch-Nentwich EM, Stemple DL and Harris MP. (2017). Genetic Screen for Postembryonic Development in the Zebrafish (*Danio rerio*): Dominant Mutations Affecting Adult Form. *Genetics* 207:609-623.
- **Daane JM**, Rohner N, Konstantinidis P, Djuranovic S and Harris MP. (2016). Parallelism and epistasis in skeletal evolution identified through use of phylogenomic mapping strategies. *Mol Biol. Evol.* 33:162-173.
- Perathoner S, **Daane JM**, Henrion U, Seebohm G, Lanni SL, Higdon CW, Johnson SL, Nüsslein-Volhard C and Harris MP. (2014). Bioelectric signaling regulates size in zebrafish fins. *PLoS Genetics*, 10(1):e1004080.
- **Daane JM** and Downs KM. (2011). Hedgehog signaling in the posterior region of the mouse gastrula suggests manifold roles in the fetal-umbilical connection and posterior morphogenesis. *Dev. Dynamics*, 240: 2175–2193.
- **Daane JM**, Enders AC and Downs KM (2011). Mesothelium of the murine allantois exhibits distinct regional properties. *J. Morphology*, 272: 536–556.

Preprints & Manuscripts In Review

- Woronowicz KC, Esin EV, Markevich GN, **Daane JM**, Harris MP and FN Shkil. (2022). Phylogenomic analysis of the Lake Kronotskoe species flock of Dolly Varden charr reveals genetic signature of sympatric radiation. *bioRxiv* 10.1101/2023.02.24.529919

Invited Talks

- | | |
|---|------|
| • CU Anschutz Molecular Biology PhD Program Retreat. <u>Keynote</u> . Winter Park, CO USA | 2024 |
| • University of Northern Colorado. Greeley, CO USA | 2024 |
| • Southwest Regional Meeting for the Society for Developmental Biology (SDB). Denver, CO USA | 2024 |
| • CU-Anschutz GDDR T32 Training Program Symposium. Denver, CO USA | 2024 |
| • University of Pittsburgh. Pittsburgh, PA USA | 2024 |
| • Texas Genetics Society Annual Meeting. Austin, TX USA | 2023 |
| • 10 th Aquatic Disease Models of Human Disease Conference (AQHMD). Woods Hole, MA USA | 2022 |
| • 17 th International Zebrafish Conference. Montreal, Canada | 2022 |
| • Lehigh University. Bethlehem, PA USA | 2021 |
| • University of North Florida. Jacksonville, FL USA | 2021 |
| • University of Houston. Houston, TX USA | 2020 |
| • University at Albany. Albany, NY USA | 2020 |
| • Boston University. Boston, MA USA | 2019 |

- Mount Desert Island Biological Laboratory. Bar Harbor, ME USA 2019
- University of California-Irvine. Irvine, CA USA 2019

Contributed Talks at Conferences

- **Daane JM.** 2024. *11th Aquatic Disease Models of Human Disease Conference (AQHMD)*. San Antonio, TX
- **Daane JM.** 2024. *10th Strategic Conference of Zebrafish Investigators*. Pacific Grove, CA
- Streeter M^{*}, Le François N, Desvignes T, Grondin J, Postlethwait J, Detrich HW III, **JM Daane.** 2023. *Scientific Committee on Antarctic Research (SCAR) Open Science Conference*. Christchurch, New Zealand
- Streeter M[†], Le François N, Desvignes T, Grondin J, Postlethwait J, Detrich HW III, **JM Daane.** 2023. *Society for Integrative and Comparative Biology (SICB)*. Austin, TX
- **Daane JM**, Detrich HW III, Harris MP, Aguilar A, M Sandel. 2023. *Society for Integrative and Comparative Biology (SICB)*. Austin, TX
- **Daane JM**, Detrich HW III, Harris MP, Aguilar A, M Sandel. 2022. *Scientific Committee on Antarctic Research (SCAR) Open Science Conference*. Online
- **Daane JM.** 2022. *5th Southeast Texas Evolutionary Genetics and Genomics (STEGG) meeting*. Houston TX
- Woronowicz KC, **Daane JM**, Esin EV, Shkil FN, MP Harris. 2021. *Society for Craniofacial Genetics and Developmental Biology (SCGDB)*.
- **Daane JM**, Harris MP, Detrich HW III. 2021. *US Antarctic Science Meeting*. Online.
- **Daane JM**, Harris MP, Detrich HW III. 2021. *16th International Zebrafish Conference*. Online.
- **Daane JM**, Auvinet J, Peters M, Harris MP and Detrich HW III. 2020. *Scientific Committee on Antarctic Research (SCAR) Open Science Conference*. Online
- **Daane JM**, Auvinet J, Stoebeu A, Yergeau D, Harris MP and Detrich HW III. 2020. *79th Society for Developmental Biology (SDB) Annual Meeting*. Online
- **Daane JM** and Harris MP. 2014. *11th International Conference on Zebrafish Development and Genetics*. Madison, WI

Contributed Posters at Conferences

- Kalavadwala H[‡] and **Daane JM.** 2023. *Society for Integrative and Comparative Biology (SICB)*. Austin, TX
- Larouche O[§], Betancur-R R, **Daane JM.** 2023. *Society for Integrative and Comparative Biology (SICB)*. Austin, TX
- Woronowicz KC, **Daane JM**, MP Harris. 2021. *80th Society for Developmental Biology (SDB) Annual Meeting*. Online.
- **Daane JM**, Harris MP, Detrich HW III. 2021. *The Biology of Genomes. Cold Spring Harbor Laboratories*. Online
- Woronowicz KC, **Daane JM**, MP Harris. 2021. *16th International Zebrafish Conference*. Online.
- **Daane JM**, Dornburg A, Near TJ, Harris MP, Detrich HW III. 2019. *2nd Pan-American Society for Evolutionary Developmental Biology Meeting*. Miami, FL. **1st Place Poster Award** (postdoc category).

* Graduate trainee

† Graduate trainee

‡ Graduate trainee

§ Postdoctoral trainee

- **Daane JM**, Dornburg A, Near TJ, Harris MP, Detrich HW III. 2019. *Gordon Research Conference on Ecological and Evolutionary Genomics*. Manchester, NH
- **Daane JM**, Dornburg A, Near TJ, Harris MP, Detrich HW III. 2019. *78th Annual Society for Developmental Biology (SDB) Meeting*. Boston, MA
- **Daane JM**, Rohner N, Konstantinidis P, Djuranovic S, Harris MP. 2015. *1st Pan-American Society for Evolutionary Developmental Biology*. Berkeley, CA
- **Daane JM**, Rohner N, Konstantinidis P, Djuranovic S, Harris MP. 2015. *Gordon Research Conference on Molecular Mechanisms in Evolution*. Easton, MA
- **Daane JM** and Downs KM. 2009. *68th Annual Society for Developmental Biology (SDB)*. San Francisco, CA
- **Daane JM** and Downs KM. 2008. *67th Annual Society for Developmental Biology (SDB) Meeting*. Philadelphia, PA

Postdoctoral trainees

-
- | | |
|--|--------------|
| • Dr Daniel Wright | 2022-present |
| <i>Recipient of NSF Postdoctoral Fellowship (OPP-2420167, 2024-2026)</i> | |
| • Dr Olivier Larouche | 2022-2024 |
| <i>Now an Assistant Professor at Western Carolina University</i> | |

Graduate trainees

-
- | | |
|---|--------------|
| • Sara Loetzerich, UH Ph.D. student, Cellular and Molecular Biology | 2023-present |
| • Margaret Streeter, UH Ph.D. student, Ecology and Evolution | 2022-present |
| • Hussain Kalavadwala, UH Ph.D. student, Cellular and Molecular Biology | 2022-present |
| • Anay Ochoa, UH Ph.D. student, Ecology and Evolution | 2022-present |
| • Syedahira Zahid, UH Ph.D. rotation student, Cellular and Molecular Biology | Spring 2023 |
| • Sohana al Sanjee, UH Ph.D. rotation student, Cellular and Molecular Biology | Fall 2022 |

Undergraduate trainees

-
- | | |
|---|--------------|
| • Somtochukwu Kachikwu, University of Houston | 2024-present |
| • Bryan Salinas, University of Houston | 2024-present |
| • Brayan Gutierrez, University of Houston | 2023-present |
| • Katie Le, University of Houston | 2023-present |
| • Ashlynn Armour, University of Houston | 2023-2024 |
| • Husain Boxwalla, University of Houston | 2023-2024 |
| • Michelle Tran, University of Houston | 2022-2023 |
| <i>Currently a Master's student at UT-Health</i> | |
| • Jeriyla Kamau-Weng, Northeastern University. | 2021-2023 |
| <i>Currently a Research Analyst at OceanX</i> | |
| • Elise Armstrong, Northeastern University. | 2018 |
| <i>Currently a PhD student at Boston University</i> | |

Teaching

- BIOL3301-Mendelian and Population Genetics, Instructor Fall 2024
- BIOL6397-Selected Topics in Biology – Proposal Writing, Instructor Spring 2024
- BIOL4302-Galapago Research-based Learning Abroad, Co-Instructor Spring 2024
- BIOL6311-Genomic Data Analysis, Guest Lecturer Spring 2024
- BIOL3301-Mendelian and Population Genetics, Instructor Fall 2023
- BIOL4302-Galapago Research-based Learning Abroad, Co-Instructor Spring 2023
- BIOL6397-Selected Topics in Biology - Omic Methods Working Group, Instructor Spring 2023
- BIOL3386-Biology & Biochemistry Undergraduate Research Scholarship (BURS), Guest Lecturer Spring 2023

Professional Service

- Ad Hoc Reviewer
 - National Science Foundation (NSF) Office of Polar Programs (OPP)* 2022,2024
 - National Science Foundation (NSF) Division of Environmental Biology (DEB)* 2023,2024
- Peer Reviewer 2021-present
 - Cell, Current Biology, Proceedings of the National Academy of Sciences (PNAS), eLife, Cell Reports, Genome Research, BMC Biology, Molecular Ecology, Molecular Biology & Evolution, Journal of Heredity, Genome Biology & Evolution, iScience, Journal of Molecular Evolution, Bioinformatics Advances*

Departmental Service

- UH Dept. Biology & Biochemistry Graduate Dissertation Committee Member
 - Aliasghar Zarezadehmehrzi (Cell & Molecular Biology, Stuart Dryer) 2024-present
 - Elizabeth Martinez Soler (Cell & Molecular Biology, John O'Brien) 2024-present
 - Ashley Dye (Cell & Molecular Biology, Adam Stuckert) 2024-present
- UH Dept. Biology & Biochemistry Graduate Recruitment and Admissions Committee 2022-present
- UH Dept. Biology & Biochemistry Faculty Search Committee
 - Cell & Molecular Biology Division, Neuroscience (Wangchao Xu) Spring 2024
- UH Houston Genetics BIORETS 2023-present
 - Guest lecturer 2023,2024
 - Hosted three area high school teachers in lab
 - Arinola Adedeji, Harmony School of Excellence Summer 2024
 - Sara Epp, Eastwood Academy Summer 2023
 - Brian Gonzalez, Spring Woods HS Summer 2023
- UH BioTechnology Academy Summer 2023, 2024
 - Guest lecturer