

# Jacob M. Daane, PhD

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

## Professional Appointments

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

## Education

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

## Training

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- 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

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- Daane JM** (PI). NIH 1R35GM150590-01. 2023-2028  
Phylogenomic mechanisms of trait evolution and resilience to disease.  
Total funding: \$1,937,500
- Gerringer M (PI), **Daane JM** (co-PI). NSF 2407552. 2024-2027  
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

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### Fellowships

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- 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

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

### Publications

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- 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, Stoebenau 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

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- 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

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- *CU Anschutz Molecular Biology PhD Program Retreat. Keynote*. 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<sup>th</sup> Aquatic Disease Models of Human Disease Conference (AQHMD)*. Woods Hole, MA USA 2022
- *17<sup>th</sup> 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

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- **Daane JM**. 2024. *11<sup>th</sup> Aquatic Disease Models of Human Disease Conference (AQHMD)*. San Antonio, TX
- **Daane JM**. 2024. *10<sup>th</sup> Strategic Conference of Zebrafish Investigators*. Pacific Grove, CA
- Streeter M<sup>\*</sup>, 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<sup>†</sup>, 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. *5<sup>th</sup> 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. *16<sup>th</sup> 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, Stoebenau A, Yergeau D, Harris MP and Detrich HW III. 2020. *79<sup>th</sup> Society for Developmental Biology (SDB) Annual Meeting*. Online
- **Daane JM** and Harris MP. 2014. *11<sup>th</sup> International Conference on Zebrafish Development and Genetics*. Madison, WI

## Contributed Posters at Conferences

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

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\* 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. *78<sup>th</sup> Annual Society for Developmental Biology (SDB) Meeting*. Boston, MA
- **Daane JM**, Rohner N, Konstantinidis P, Djuranovic S, Harris MP. 2015. *1<sup>st</sup> 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. *68<sup>th</sup> Annual Society for Developmental Biology (SDB)*. San Francisco, CA
- **Daane JM** and Downs KM. 2008. *67<sup>th</sup> Annual Society for Developmental Biology (SDB) Meeting*. Philadelphia, PA

## Postdoctoral trainees

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

## Graduate trainees

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- 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

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- 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  
*Currently a Master's student at UT-Health*
- Jeriyla Kamau-Weng, Northeastern University. 2021-2023  
*Currently a Research Analyst at OceanX*
- Elise Armstrong, Northeastern University. 2018  
*Currently a PhD student at Boston University*

## Teaching

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- 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

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- Ad Hoc Reviewer 2022,2024  
*National Science Foundation (NSF) Office of Polar Programs (OPP)*  
*National Science Foundation (NSF) Division of Environmental Biology (DEB)*
- 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

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- UH Dept. Biology & Biochemistry Graduate Dissertation Committee Member 2024-present  
 Aliasghar Zarezadehmehrzi (Cell & Molecular Biology, Stuart Dryer)  
 Elizabeth Martinez Soler (Cell & Molecular Biology, John O'Brien)  
 Ashley Dye (Cell & Molecular Biology, Adam Stuckert)
- UH Dept. Biology & Biochemistry Graduate Recruitment and Admissions Committee 2022-present
- UH Dept. Biology & Biochemistry Faculty Search Committee Spring 2024  
 Cell & Molecular Biology Division, Neuroscience (Wangchao Xu)
- 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