

Tristram O'Brien Dodge

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Profile

Fifth-year Ph.D. candidate in the Schumer Lab at Stanford University. Interested in the origin and maintenance of phenotypic variation, especially how structurally variable genomic regions contribute to these processes. Dissertation research investigates the genetic basis and evolution of pigmentation traits in a diverse group of freshwater fishes (*Xiphophorus*) using long-read sequencing, functional genomics, behavioral experiments, and field collections.

Education

- 2021 – **Ph.D. in Biology**, Ecology and Evolutionary Biology Track
Stanford University, Stanford, CA
Advisor: Molly Schumer
Committee: Nicolas Altemose, Dmitri Petrov, Jonathan Pritchard
- 2015 – 2019 **B.A. in Biology**, *summa cum laude*
Carleton College, Northfield, MN

Positions

- 2021 – **Graduate Student Researcher & NSF GRFP Fellow**, Stanford University
Supervisor: Molly Schumer, Ph.D.
- 2022 **Fulbright Future Scholar**, University of Sydney
Supervisors: Carolyn Hogg, Ph.D. & Katherine Belov, Ph.D.
- 2019 **Staff Research Associate II**, University of California, Berkeley
Supervisor: Benjamin Blackman, Ph.D.
- 2018 **Summer Research Assistant**, Rocky Mountain Biological Laboratory
Supervisors: Lauren Carley, Ph.D. & Thomas Mitchell-Olds, Ph.D.

Honors, Awards, & Grants

- 2026 Society for the Study of Evolution W. D. Hamilton Award Finalist
Center for Computational, Evolutionary, and Human Genomics Fellowship
- 2025 Society of Systematic Biologists Graduate Student Research Award
Society for Molecular Biology and Evolution Young Investigator Travel Award
Society for the Study of Evolution Rosemary Grant Advanced Award
- 2024 American Society of Naturalists Student Research Award
Genetics Society of America Early Career Poster Award
Society for Integrative Biology Grant in Aid of Research
- 2023 Excellence in Teaching Award, Stanford University Department of Biology
- 2022 National Science Foundation Graduate Research Fellowship
- 2020 Fulbright Future Scholarship, Australia
- 2019 Summa Cum Laude, Carleton College
Phi Beta Kappa Honor Society, Carleton College
Academic All-American, NCAA Division III Cross Country and Track & Field
All-American, NCAA Division III Outdoor Track & Field
- 2018 Central Region Athlete of the Year, NCAA Division III Cross Country

Publications

8. **Dodge, T.O.**, Farquharson, K.A., Ford, C., Cavanagh, L., Schubert, K., Schumer, M., Belov, K., and Hogg, C.J. (2025) Genomes of two Extinct-in-the-Wild reptiles from Christmas Island reveal distinct evolutionary histories and conservation insights. **Molecular Ecology Resources**, 25, e13780. doi: 10.1111/1755-0998.13780
7. Couper, L.I., **Dodge, T.O.**, Hemker, J.A., Kim, B.Y., Exposito-Alonso, M., Brem, R.B., Mordecai, E.A., and Bitter, M.C. (2025) Evolutionary adaptation under climate change: *Aedes* sp. demonstrates potential to adapt to warming. **PNAS**, 122: e2418199122. doi: 10.1073/pnas.2418199122
6. **Dodge, T.O.**, Kim, B.Y., Baczenas, J.J., Banerjee, S.M., Gunn, T.R., Donny, A.E., Given, L.A.[§], Rice, A.R.[§], Haase Cox, S.K., Weinstein, M.L., Cross, R., Moran, B.M., Haber, K., Haghani, N.B., Machin Kairuz, J.A., Gellert, H.R., Du, K., Aguillon, S.M., Tudor, M.S., Gutiérrez-Rodríguez, C., Rios-Cardenas, O., Morris, M.R., Scharl, M., Powell, D.L., and Schumer, M. (2024) Structural variation and behavioral interactions underpin a balanced sexual mimicry polymorphism. **Current Biology**, 34: 4662-4676.e9. doi: 10.1016/j.cub.2024.08.053 [§]Undergraduate
5. Preising, G.A., Gunn, T.R., Baczenas, J.J., Powell, D.L., **Dodge, T.O.**, Sewell, S.T., Pollock, A., Machin Kairuz, J.A., Savage, M.L., Lu, Y., Fitschen-Brown, M., Meyer, A., Scharl, M., Cummings, M., Thakur, S., Inman, C.M., Rios-Cardenas, O., Morris, M., Tobler, M., and Schumer, M. (2024) Recurrent evolution of small body size and loss of the sword ornament in Northern swordtail fish. **Evolution**, 78: 2017–2031. doi: 10.1093/evolut/qpae124
4. Du, K., Ricci, J.M.B., Lu, Y., Garcia-Olazabal, M., Walter, R.B., Warren, W.C., **Dodge, T.O.**, Schumer, M., Park, H., Meyer, A., and Scharl, M. (2024) Phylogenomic analyses of all species of swordtail fishes (genus *Xiphophorus*) show that hybridization preceded speciation. **Nature Communications**, 15: 6609. doi: 10.1038/s41467-024-50852-6
3. Langdon, Q.K., Groh, J.S., Aguillon, S.M., Powell, D.L., Gunn, T.R., Payne, C.Y., Baczenas, J.J., Donny, A., **Dodge, T.O.**, Du, K., Scharl, M., Ríos-Cárdenas, O., Gutierrez-Rodríguez, C., Morris, M., and Schumer, M. (2024). Swordtail fish hybrids reveal that genome evolution is surprisingly predictable after initial hybridization. **PLoS Biology**, 22(8): e3002742. doi: 10.1371/journal.pbio.3002742
2. Aguillon, S.M., **Dodge, T.O.**, Preising, G.A., and Schumer, M. (2022) Introgression. **Current Biology**, 32(16): 865-868. doi: 10.1016/j.cub.2022.07.004
1. Langdon, Q.K., Powell, D.L., Kim, B., Banerjee, S.M., Payne, C.Y., **Dodge, T.O.**, Moran, B., Fascinetto-Zago, P., and Schumer, M. (2022) Predictability and parallelism in the contemporary evolution of hybrid genomes. **PLoS Genetics**, 18(1): e1009914. doi: 10.1371/journal.pgen.1009914

Preprints

3. Given, L.A.[§], Gozashti, L., Baczenas, J.J., Sood, R., Haghani, N.B., Hunnicutt, K.E., Gunn, T.R., Preising, G.A., Sudmant, P.H., Powell, D.L., **Dodge, T.O.***, and Schumer, M.* (*in revision*) Two melanistic pigment patterns are associated with a sex chromosome-linked oncogene in the mountain swordtail *Xiphophorus nezahualcoyotl*. doi: 10.64898/2026.06.08.730778 [§]Undergraduate *Co-supervision

2. **Dodge, T.O.[†]**, Ernst, M.[†], Oliver, P., and Blom, M.P.K. (*in review*) Suboptimal sampling strategy for high-quality genome assembly: A comparative view on the demise of an Extinct-in-the-Wild reptile. [†]*Equal contribution*
1. Haghani, N.B., **Dodge, T.O.**, Baczenas, J.J., Gunn, T.R., He, Q., Pangburn, W., Sood, R., Fascinetto-Zago, P., Du, K., Kaatmann, A., Ou, Z., Dougan, S., Yang, T.T.L., Olmos-Santiago, N.S., Preising, G.A., Payne, C.Y., Haase Cox, S.K., Hunnicutt, K.E., Madrzyk, M., Moran, B., Stigloher, C., Powell, D.L., Scharl, M., Gifford, C.A., Han, G.-Z., and Schumer, M. (*in revision*) Insertion of an invading retrovirus regulates a novel color trait in swordtail fish. doi: 10.1101/2025.11.07.687308

Oral & Poster Presentations

- 2026 **Evolution W.D. Hamilton Award Symposium**, Online conference
 Oral presentation: Turnover and introgression shape the dynamic evolution of a balanced polymorphism involved in sexual mimicry. (Presented virtually)
Bay Area Population Genomics (BAPG XXV), Davis, CA, United States
 Oral presentation: Turnover and introgression shape the dynamic evolution of a sexual mimicry polymorphism shared across the genus *Xiphophorus*.
Center for Computational, Evolutionary, and Human Genomics (CEHG) Symposium, Stanford, CA, United States
 Invited oral presentation: Turnover and introgression shape the dynamic evolution of a sexual mimicry polymorphism shared across the genus *Xiphophorus*.
Plant and Animal Genomes (PAG33), San Diego, CA, United States
 Oral presentation: Turnover and introgression shape the dynamic evolution of a sexual mimicry polymorphism shared across the genus *Xiphophorus*.
- 2025 **UC Berkeley CTEG Seminar**, Berkeley, CA, United States
 Invited oral presentation: Turnover and introgression contribute to the maintenance of a sexual mimicry trans-species polymorphism.
Society for Molecular Biology and Evolution (SMBE2025), Beijing, China
 Oral presentation: Origin and maintenance of a shared sexual mimicry polymorphism. (Presented virtually)
Biology of Genomes (BOG39), Cold Spring Harbor, NY, United States
 Poster: Origin and maintenance of a shared sexual mimicry polymorphism.
- 2024 **Bay Area Population Genomics (BAPG XXIII)**, Berkeley, CA, United States
 Poster: Origin and maintenance of a shared sexual mimicry polymorphism.
Society for Molecular Biology and Evolution (SMBE2024), Puerto Vallarta, Mexico
 Oral presentation: Intergenic structural variation and ancient gene duplication underpin pigmentation diversification in swordtail fish.
The Allied Genetics Conference (TAGC24), Washington, D.C., United States
 Oral presentation: Ancient gene duplication and recent non-coding structural variation underpin pigmentation diversification in swordtail (*Xiphophorus*) fishes.
Received GSA Early Career Poster Award for PEQG section.

- 2023 **Society for Molecular Biology and Evolution (SMBE2023)**, Ferrara, Italy
Poster: The genetic architecture of adaptive pigmentation traits in swordtail (*Xiphophorus*) fishes.
- 2022 **HHMI Science Meeting**, Chevy Chase, MD, United States
Poster: The genetic architecture of adaptive pigmentation traits in swordtail (*Xiphophorus*) fishes.
Bay Area Population Genomics (BAPGXX), Berkeley, CA, United States
Oral presentation: The genetic architecture of sexual mimicry in swordtail (*Xiphophorus*) fishes.
Australian Society of Herpetologists, Adelaide, Australia
Oral presentation: Genomes of endangered reptiles provide insights into evolution and conservation.
SOLES Research Showcase, Sydney, Australia
Oral presentation: Crossing the Pacific to develop insights into genomes, evolution, and conservation.
Received honorable mention for best talk.
- 2021 **Society for Molecular Biology and Evolution (SMBE2021)**, Online conference
Poster: The genetic architecture of adaptive pigmentation traits in swordtail (*Xiphophorus*) fishes. (Presented virtually)
Evolution, Online conference
Oral presentation: The genetic architecture of a female mimicry trait in male swordtail fish. (Presented virtually)
- 2019 **Midwest Ecology and Evolution Conference**, Terre Haute, IN, United States
Poster: Little cost of reproduction in the long-lived perennial, *Echinacea angustifolia*.
- 2017 **Carleton College Student Research Symposium**, Northfield, MN, United States
Poster: Mammalian herbivores differentially affect light availability and species richness in restored prairies.

Teaching Experience

- Stanford University Long-read Sequencing and Structural Variation (BIOS 424) — Instructor
- Designed and co-taught 3-week minicourse for graduate students, including lecture and laboratory components. Taught for 3 years.
- Evolution (BIO 85) — TA for Prof. Molly Schumer
- Led weekly sections of 15 students, designed lecture to review class content, and graded assignments/exams.
Received Departmental Excellence in Teaching Award.
- Genetics (BIO 82) — TA for Profs. Dominique Bergmann & Michael Simon
- Led two weekly sections of 20 students each, designed lecture to review class content, and facilitated group problem solving.
- Carleton College Population Ecology (BIOL 352) — Grader for Prof. Mark McKone
- Designed review problem sets, hosted review sessions for students, and graded assignments.

Service & Outreach

Research Mentorship

Primary mentor to seven early-career researchers in the Schumer Lab and through structured research training programs during the summer. [§]*Undergraduate co-author* on published manuscript.

Students supervised, listed with past affiliations and project topic:

- 2026 – María José Rodríguez-Barrera — National Autonomous University of Mexico, Undergrad and PostBac in Schumer Lab, *bioinformatics and behavior*
- 2026 Alfred Boniphace Lazaro — Ifakara Health Institute, MERIT, *bioinformatics*
- 2025 Anthony Sifuentes — Stanford, BSURP, *behavior and molecular techniques*
- 2023 – Lyle Given[§] — Stanford, BSURP, HHMI SURP, and Undergrad in Schumer Lab, *behavior, molecular techniques, phenotyping, and bioinformatics*
- 2023 Jalena Wouters — UC Davis, MARC, *bioinformatics*
- 2023 Angel Ochoa Rodriguez — Stanford, BioBUDS, *phenotyping*
- 2021 – 2023 Andreas Rice[§] — Cañada College, Undergrad in Schumer Lab, *phenotyping*

Mentorship program acronyms: BSURP—Stanford Biology Summer Undergraduate Research Program; HHMI SURP—Howard Hughes Medical Institute Summer Undergraduate Research Program; MARC—UC Davis Maximizing Access to Research Careers; BioBUDS—Stanford Building Up Developing Scientists in Biology; MERIT—Mentorship and Research Individualized Training program.

Graduate Admissions Mentorship

- 2023 – Stanford Biology Preview Program (BPP) organizing team member. Design and implement programming aiming to clarify biology Ph.D. application process.
- 2022 – Stanford BPP mentor. Advise mentees on graduate school application process and provide feedback on personal statements and CVs.

BPP mentees, listed with current affiliations:

- 2025 Nathan Ng — Ph.D. student, UC Berkeley
- 2024 Kaz Davila — M.S. student, San Francisco State University
- 2023 Daniel Knapp — Ph.D. student, UC Irvine
- 2022 Nemo Robles — Ph.D. student, Stanford University
- 2022 Frederick Purnell Jr. — Ph.D. student, University of Pennsylvania

Educational Outreach

- 2022 – Guest lecturer for Stanford BioBUDS. Teach course on the genetics of pigmentation for first- and second-year undergraduates interested in biology research.
- 2022 Taught primary-school lesson entitled “Spot the Differences” on detecting phenotypic variation in nature (New South Wales, Australia).
- 2021 Taught two AP Biology classes on my current research and daily life as a scientist (Leland High School, San Jose, CA).
- 2020 Taught three middle-school classes entitled “Hybrids, Hybrids Everywhere!” on hybridization in nature (Friendship Academy of the Arts, Minneapolis, MN).

Professional Service

- 2025 – Stanford Biology Ph.D. Admissions Committee student member. Review and evaluate applications to the doctoral program.
- 2024 – Peer reviewer: Molecular Biology & Evolution (2×), Genome Biology & Evolution, Journal of Heredity, Ecology & Evolution, Current Biology.