Tristram O'Brien Dodge

Email: tododge@stanford.edu
Website: www.tododge.com

Profile

Fifth-year Ph.D. candidate in the Schumer Lab at Stanford University. Interested in adaptation, hybridization, conservation, structural variation, and genome evolution. Dissertation research integrates long-read sequencing, functional genomics, fieldwork, and behavioral experiments to understand the origin and maintenance of pigmentation polymorphisms in *Xiphophorus* fishes.

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.
- Investigate genetic architecture and maintenance of pigmentation traits, focusing on roles of introgression and balancing selection.
- Generate and analyze genomic resources, focusing on sex chromosomes and other structurally complex regions.

2022 **Fulbright Future Scholar**, University of Sydney
Supervisors: Carolyn Hogg, Ph.D. & Katherine Belov, Ph.D.
- Assembled and analyzed reference genomes for two extinct-in-the-wild reptile species.

2019 **Staff Research Associate II**, University of California, Berkeley
Supervisor: Benjamin Blackman, Ph.D.
- Phenotyped sunflower association mapping panel to identify genetic and environmental controls on floral development timing.
- Quantified constitutive gene expression differences to understand adaptation to serpentine soils in monkeyflowers.

2019 **Undergraduate Research Assistant**, Carleton College
Supervisor: Jennifer Wolff, Ph.D.
- Investigated nematode community structure in restored tallgrass prairies using sequence metabarcoding data.

2018 **Summer Research Assistant**, Rocky Mountain Biological Laboratory
Supervisors: Lauren Carley & Thomas Mitchell-Olds, Ph.D.
- Contributed phenotypic data to GWAS of survival, growth, chemical defense, and phenology of a rocky-mountain plant.

2017 **Summer Research Assistant**, Carleton College
Supervisors: Daniel Hernández, Ph.D. & Mark McKone, Ph.D.
- Contributed plant census and phenology data to studies of herbivore exclusion effects in prairies.

Publications

8. 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.

7. **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., Schartl, 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.

6. 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., Schartl, 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.

5. 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 Schartl, 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.

4. 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., Schartl, 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.

3. **Dodge, T.O.**, Farquharson, K.A., Ford, C., Cavanagh, L., Schubert, K., Schumer, M., Belov, K., and Hogg, C.J. (2023). 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.

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.2022.4.

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.

Unpublished

2. Ernst, M.[†], **Dodge, T.O.**[†], Oliver, P., and Blom, M.P.K. (*in revision*) 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., Schartl, 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.

Oral & Poster Presentations

2026 **Plant and Animal Genomes (PAG33)**, San Diego, C.A., United States
Presentation title: Turnover and introgression shape the dynamic evolution of a sexual mimicry polymorphism shared across the genus *Xiphophorus*.

2025 **UC Berkeley CTEG Seminar**, Berkeley, C.A., United States
Presentation title: Turnover and introgression contribute to the maintenance of a sexual mimicry trans-species polymorphism.

Society for Molecular Biology and Evolution (SMBE2025), Beijing, China
Presentation title: Origin and maintenance of a shared sexual mimicry polymorphism. (Presented virtually)

Biology of Genomes (BOG39), Cold Spring Harbor, N.Y., United States
Poster title: Origin and maintenance of a shared sexual mimicry polymorphism.

2024 **Bay Area Population Genomics (BAPG XXIII)**, Berkeley, C.A., United States
Poster title: Origin and maintenance of a shared sexual mimicry polymorphism.

Society for Molecular Biology and Evolution (SMBE2024), Puerto Vallarta, Mexico
Presentation title: Intergenic structural variation and ancient gene duplication underpin pigmentation diversification in swordtail fish.

The Allied Genetics Conference (TAGC24), Washington, D.C., United States
Poster title: 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 title: The genetic architecture of adaptive pigmentation traits in swordtail (*Xiphophorus*) fishes.

2022 **HHMI Science Meeting**, Chevy Chase, M.D., United States
Poster title: The genetic architecture of adaptive pigmentation traits in swordtail (*Xiphophorus*) fishes.

Bay Area Population Genomics (BAPGXX), Berkeley, C.A., United States
Presentation title: The genetic architecture of sexual mimicry in swordtail (*Xiphophorus*) fishes.

Australian Society of Herpetologists, Adelaide, Australia
Presentation title: Genomes of endangered reptiles provide insights into evolution and conservation.

SOLES Research Showcase, Sydney, Australia
Presentation title: Crossing the Pacific to develop insights into genomes, evolution, and conservation.
Received honorable mention for best talk.

2021 **Society for Molecular Biology and Evolution (SMBEv2021)**, Online conference
Poster title: The genetic architecture of adaptive pigmentation traits in swordtail (*Xiphophorus*) fishes. (Presented virtually)

Evolution, Online conference
Presentation title: the genetic architecture of a female mimicry trait in male swordtail fish. (Presented virtually)

2019 **Midwest Ecology and Evolution Conference**, Terre Haute, I.N., United States
Poster title: Little cost of reproduction in the long-lived perennial, *Echinacea angustifolia*.

2017 **Carleton College Student Research Symposium**, Northfield, M.N., United States
Poster title: Mammalian herbivores differentially affect light availability and species richness in restored prairies.

Teaching Experience

Stanford University

Structural Genomic Variation (BIOS 424) — Instructor
- Designed and taught 3-week minicourse including lecture and laboratory components.

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

Reviews provided: Genome Biology & Evolution (2026), Molecular Biology & Evolution (2025), Journal of Heredity (2025), Ecology & Evolution (2025), Current Biology (2024)

2023 – Stanford Biology Preview Program (BPP) organizer. Create and organize programming for Stanford BPP, a program aiming to demystify Ph.D. application process, particularly for students historically underrepresented in science.

2023, 2025 Stanford Biology Summer Undergraduate Research Program (BSURP) mentor. Supervised first- and second-year students from Stanford in full-time summer research program.

2022 –	Building Up Developing Scientists in Biology (BioBUDS) mentor. Designed and taught class on the biology of pigmentation. Supervised first- and second-year students from Stanford in evolutionary biology research.
2022	Designed and implemented evolution activity called "spot the differences," about identifying phenotypic polymorphisms in collaboration with non-profit organization Deadly Science for primary school students in New South Wales, Australia.
2021 –	Stanford Biology Preview Program (BPP) mentor. Workshop and provide feedback on graduate school personal statements and CVs.
2021	Taught 2 AP Biology classes at Leland High School about current research and what daily life looks like for a scientist.
2020	Taught 3 middle school classes at Friendship Academy of the Arts in Minneapolis about the role of hybridization in nature (title: Hybrids, hybrids everywhere!).

Honors, Awards, & Grants

2025	Society of Systematic Biologists Graduate Student Research Award, *$2,765*
	Society for Molecular Biology and Evolution Young Investigator Travel Award
	Society for the Study of Evolution Rosemary Grant Advanced Award, *$3,395*
2024	American Society of Naturalists Student Research Award, *$2,000*
	Genetics Society of America Early Career Poster Award
	Society for Integrative Biology Grant in Aid of Research, *$1,000*
	Stanford Ecology and Evolution Travel Grant
2023	Excellence in Teaching Award, Stanford University Department of Biology
2022	National Science Foundation Graduate Research Fellowship, *$138,000*
2020	Fulbright Future Scholarship
2019	National Science Foundation Graduate Research Fellowship, Honorable Mention
	Summa Cum Laude, Carleton College
	Phi Beta Kappa Honor Society, Elected Member
	All-American, NCAA Division III Outdoor Track & Field
	Dean of the College Student Academic Travel Grant, *$460*
	Academic All-American, NCAA Division III Cross Country and Track & Field
	Elite 22 Academic Award, Minnesota Intercollegiate Athletic Conference Indoor Track & Field
2018	Cross Country Athlete of the Year, NCAA Division III Central Region
	Annual Dean's List, Carleton College
	William S. and Mary Agnes Kelly Memorial Award
	Towsley Endowment Support for Summer Research, *$3,600*
2017	Annual Dean's List, Carleton College