

# Tristram O'Brien Dodge

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## Profile

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Second-year Biology PhD student in the Schumer Lab at Stanford University. Interested in adaptation, hybridization, and conservation genomics. Graduate research integrates field research with genome sequencing to better understand the origin and maintenance of shared pigmentation polymorphisms in swordtail fishes (*Xiphophorus*).

## Education

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

## Publications

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- 2023 **Dodge, T.O.**, Farquharson, K.A., Ford, C., Cavanagh, L., Schubert, K., Schumer, M., Belov, K., and Hogg, C.J. (*in press*) Genomes of two Extinct-in-the-Wild reptiles from Christmas Island reveal distinct evolutionary histories and conservation insights. *Molecular Ecology Resources*. doi: 10.1111/1755-0998.13780.
- 2022 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.
- 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 Preising, G.A., Gunn, T.R., Baczenas, J.J., Pollock, A., Powell, D.L., **Dodge, T.O.**, Machin Kairuz, J.A., Savage, M.L., Lu, Y., Fitschen-Brown, M., Cummings, M., Thakur, S., Tobler, M., Ríos-Cardenas, O., Morris, M., and Schumer, M. (*in review*) Recurrent evolution of small body size and loss of the sword ornament in Northern Swordtail fish. *bioRxiv*. doi: 10.1101/2022.12.24.521833.

## Poster Presentations

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- 2022 **Dodge, T.O.**, Powell, D.L., Banerjee, S.M., Gunn, T.R., Baczenas, J.J., Preising, G.A., Rice, A., Jofre, G.I., Rosenthal, G.G., and Schumer, M. The genetic architecture of adaptive pigmentation traits in swordtail (*Xiphophorus*) fishes. HHMI Science Meeting, Chevy Chase, MD, December 2022.

- 2021 **Dodge, T.O.**, Powell, D.L., Jofre, G.I., Rosenthal, G.G., Schartl, M., and Schumer, M. The genetic architecture of a female mimicry trait in male swordtail fish. *SMBEv2021, Presented Virtually*, July 2021.
- 2019 **Dodge, T.O.**, LaScaleia, M.J., Richardson, L.K., and Wagenius, S. Little cost of reproduction in the long-lived perennial, *Echinacea angustifolia*. Midwest Ecology and Evolution Conference, Terre Haute, IN, April 2019.
- 2017 **Dodge, T.O.**, Faust, R., Harvey, C., Hoyt, A., Libby, K., Pruszenski, J., Hernández, D.L., and McKone, M.J. Mammalian herbivores differentially affect light availability and species richness in restored prairies. Carleton College Student Research Symposium, Northfield, MN, October 2017.

## Talks

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- 2022 The genetic architecture of sexual mimicry in swordtail (*Xiphophorus*) fishes. Bay Area Population Genomics (BAPG), Berkeley, CA.  
Genomes of endangered reptiles provide insights into evolution and conservation. Australian Society of Herpetologists, Adelaide, SA, Australia.  
Crossing the Pacific to develop insights into genomes, evolution, and conservation. SOLES Research Showcase, Sydney, NSW, Australia.  
*Awarded honorable mention for best talk*
- 2021 The genetic architecture of a female mimicry trait in male swordtail fish. Evolution, *Presented Virtually*.
- 2019 The curious case of the cane toad: identifying determinants of toxic trophic cascades. Carleton College Comprehensive Senior Exercise, Northfield, MN.

## Research Experience

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- 2021 – **Stanford University, PhD Student**  
Supervisor: Molly Schumer (PI)
- Study genetic architecture of pigmentation patterning and evolution of tissue-specific enhancers in swordtail fish.
  - Investigate the origin and maintenance of adaptive traits in swordtail fish, focusing on the roles of introgression and balancing selection.
- 2022 **University of Sydney, Fulbright Future Scholar**  
Supervisors: Carolyn Hogg (co-PI) and Katherine Belov (co-PI)
- Assemble and annotate reference genomes for two extinct-in-the-wild reptiles.
  - Reconstruct history of swordtail fish invasion of Australia by generating and analyzing whole-genome sequence data of feral and aquarium individuals.
- 2019 – 2021 **University of California, Berkeley, Staff Research Associate II**  
Supervisor: Benjamin Blackman (PI)
- Phenotyped sunflower mapping panel and built models to identify genetic and environmental controls on late-stage floral development timing.
  - Quantified constitutive gene expression differences to understand adaptation to serpentine adaptation in monkeyflowers.

- 2019 **Carleton College, Undergraduate Research Assistant**  
Supervisor: Jennifer Wolff (PI)
- Investigated nematode community structure in restored tallgrass prairies using metabarcoding sequence data.
- 2018 **Rocky Mountain Biological Laboratory, Summer Research Assistant**  
Supervisors: Lauren Carley & Thomas Mitchell-Olds (PI)
- Contributed phenotypic data to GWAS of survival, growth, chemical defense, and phenology of a rocky-mountain plant.
- 2017 **Carleton College, Summer Research Assistant**  
Supervisors: Daniel Hernández (co-PI) & Mark McKone (co-PI)
- Contributed plant census and phenology data to studies of herbivore exclusion effects in prairies.

## Teaching Experience

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- Stanford University Evolution (BIO 85) — Professor Molly Schumer
- Led weekly sections of 15 students – designed lecture to review class content and facilitated group problem solving.
- Genetics (BIO 82) — Professors Dominique Bergmann & Michael Simon
- Led 2 weekly sections of 20 students each – designed lecture to review class content and facilitated group problem solving.
- Carleton College Population Ecology (BIOL 352) — Professor Mark McKone
- Designed review problem sets, hosted practice sessions for students, graded weekly or biweekly homework assignments.

## Outreach and Service

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- 2022 Designed and implemented evolutionary biology activity called “spot the differences,” about identifying polymorphisms within species in collaboration with Deadly Science for primary school students in New South Wales Australia.
- 2021 – Stanford Biology Preview Program Peer mentor.
- 2021 Taught 2 AP Biology classes at Leland High School about my current research (The genetic architecture of a female mimicry trait in male swordtail fish), and what daily life looks like as a scientist.
- 2020 Taught 3 middle school class periods at Friendship Academy of the Arts in Minneapolis (over zoom) about the role of hybridization in nature (title: Hybrids, hybrids everywhere!).

## Additional Experience

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- 2020 – 2021 **Assistant Cross Country and Track Coach, The College Preparatory School**
- 2015 – 2019 **Cross Country and Track Captain, Carleton College**
- 2016 – 2019 **NCAA Student-Athlete Advisory Committee, Carleton College**

## Honors, Awards, and Memberships

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- 2022 National Science Foundation Graduate Research Fellowship, *\$138,000*
- 2020 Fulbright Future Scholarship  
National Science Foundation Graduate Research Fellowship, Honorable Mention
- 2019 Summa Cum Laude, Carleton College  
Phi Beta Kappa Honor Society, Elected Member  
Sigma Xi Research Honor Society, Elected Associate 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
- 2017 Towsley Endowment Support for Summer Research, *\$3,600*  
Annual Dean's List, Carleton College