

Gabriel A. Preising

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 Palo Alto, CA

Research Interests: structural variation, sex chromosomes, evolutionary genomics, computational biology

Education

Sept 2021–present **Ph.D. Biology – Stanford University** Stanford, CA
 PI: Dr. Molly Schumer. Expected graduation spring 2027.
 May 2020 **B.A. Biology – Reed College** Portland, OR
 PIs: Dr. Suzy Renn & Dr. Anna Ritz

Experience

Sept 2021–Present **PhD Candidate**, Stanford University, Stanford, CA
 May 2020–Aug 2021 **Post-Baccalaureate Research Assistant**, Reed College, Portland, OR
 Aug 2019–May 2020 **Animal Care Technician**, Reed College, Portland, OR
 May 2019–Aug 2019 **Bioinformatics Research Fellow** Reed College, Portland, OR
 May 2018–Aug 2018 **Undergraduate Research Assistant** Reed College, Portland OR
 Aug 2017–May 2020 **Biology Stockroom Worker**, Reed College, Portland, OR

Publications and Presentations

In Prep

1. **G.A. Preising**, T.O. Dodge, D.L. Powell, J.J. Baczenas, T.R. Gunn, A.E. Donny, R. Sood, P. Fascinetto-Zago, R. Cross, S.M. Mason, E.P. Alexander, A.J. Harris, K. Du, C. Gutiérrez-Rodríguez, O. Rios-Cardenas, M.R. Morris, M. Schumer (*in prep*). Y-chromosome structural variants underlie reproductive morphs in swordtail fishes.

Publications

[†] *Co-first authors*

1. L.A. Given, L. Gozashti, J.J. Baczenas, R. Sood, N.B. Haghani, K.E. Hunnicutt, T.R. Gunn, **G.A. Preising**, P.H. Sudmant, D.L. Powell, T.O. Dodge, M. Schumer (2026). Two melanic pigment patterns associated with a sex chromosome-linked oncogene in the Mountain swordtail *Xiphophorus nezahualcoyotl*. **bioRxiv**.
2. B.M. Moran, W.F. Ramírez-Duarte, D.L. Powell, T.T.L. Yang, T.R. Gunn, G.I. Jofre-Rodríguez, C.Y. Payne, E.N.K. Iverson, **G.A. Preising**, S.M. Banerjee, A.E. Donny, R. Sood, J.J. Baczenas, G.M. Vázquez Adame, C. Gutiérrez-Rodríguez, C.M. Rochman, M. Schumer, G.G. Rosenthal (2026). Increased rates of hybridization in swordtail fish are associated with water pollution. **Current Biology**.

3. N.B. Haghani, T.O. Dodge, J.J. Baczenas, T.R. Gunn, Q. He, W. Pangburn, R. Sood, P. Fascinetto-Zago, S. Dougan, N.S. Olmos-Santiago, T.T.L. Yang, **G.A. Preising**, Z. Ou, S.K. Haase Cox, K. Hunnicutt, M. Madrzyk, A. Kaatmann, B. Moran, K. Du, A. Moyaho-Martinez, D.L. Powell, M. Scharl, C. Gifford, G. Han, M. Schumer (2025). Insertion of an active retrovirus regulates a novel reflectance trait in swordtail fish. *bioRxiv*.
4. L. Leventhal, M.R. Ruffley, **Carnegie Field Consortium**, M. Exposito-Alonso (2025). Simulated climate change magnifies genetic vulnerabilities from mutation load and maladaptation. *bioRxiv*.
5. **G.A. Preising**, T. Gunn, J.J. Baczenas, D.L. Powell, T.O. Dodge, S.T. Sewell, A.C. Pollock, J. Machin Kairuz, M. Savage, Y. Lu, M. Fitschen-Brown, A. Meyer, M. Scharl, M. Cummings, S. Thakur, C.M. Inmam, O. Rios-Cardenas, M.R. Morris, M. Tobler, M. Schumer (2024). Recurrent evolution of small body size and loss of the sword ornament in Northern swordtail fish. *Evolution*.
6. J. Zhang, **G.A. Preising**, M. Schumer, J.A. Palacios (2023). CRP-Tree: a phylogenetic association test for binary traits. *Journal of the Royal Statistical Society Series C: Applied Statistics*.
7. S.M. Aguillón, T.O. Dodge, **G.A. Preising**, M. Schumer (2022). Primer: Introgression. *Current Biology*.
8. H. Zeng, J. Zhang, **G.A. Preising**, T. Rubel, P. Singh, A. Ritz (2021). Graphery: interactive tutorials for biological network algorithms. *Nucleic Acids Research*.
9. [†]**G.A. Preising**, [†]J.J. Faber-Hammond, and S.C.P. Renn (2021). Correspondence of aCGH and long-read genome assembly for detection of copy number differences: a proof-of-concept with cichlid genomes. *PLOS ONE*.

Conference Presentations/Posters

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| Jun 2026 | Long-read sequencing reveals the genomic architecture of alternative reproductive tactics in swordtail fishes. <i>Society for Molecular Biology and Evolution</i> , Copenhagen, DK (flash talk) |
| Jun 2026 | Evolution and genomic architecture of male reproductive strategies in swordtail fishes. <i>Population, Evolutionary, and Quantitative Genetics</i> , Pacific Grove, CA (talk) |
| May 2026 | Long-read sequencing reveals the genomic architecture of alternative reproductive tactics in swordtails fishes. <i>Biology of Genomes</i> , Cold Spring Harbor, NY (talk) |
| Jan 2026 | Y-Chromosome Structural Variation Underlies Reproductive Morphs in <i>Xiphophorus</i> . <i>The Plant and Animal Genome Conference</i> , San Diego, CA (talk) |
| Jun 2025 | Evolution and Genomic Architecture of Varied Reproductive Strategies in <i>Xiphophorus</i> . <i>Evolution</i> , Athens, GA (talk) |
| Nov 2024 | Genomic Architecture of a Body Size Polymorphism in <i>Xiphophorus</i> . <i>Bay Area Population Genetics</i> , Berkeley, CA (poster) |
| Jul 2024 | Genomic and Transcriptomic Signatures of Alternative Reproductive Tactics in a Mexican Poeciliid. <i>Society for Molecular Biology and Evolution</i> , Puerto Vallarta, MX (poster) |
| Jun 2023 | Evolution of Body Size and Reproductive Tactics in Northern Swordtail Fish. <i>Evolution</i> , Albuquerque, NM (poster) |
| Jul 2022 | Genomic Architecture of Alternative Reproductive Tactics in Swordtail Fish (<i>Xiphophorus</i>). <i>American Genetics Association</i> , Bainbridge Island, WA (poster) |
| Sept 2020 | A Protein-Protein Interactome for an African Cichlid. <i>ACM Conference on Bioinformatics, Computational Biology, and Health Informatics</i> (virtual presentation due to COVID-19) |
| Jan 2020 | aCGH Detects Copy Number Variation with Similar Resolution to PacBio Sequencing Approaches. <i>Society for Integrative and Comparative Biology</i> , Austin, TX (poster) |

Jan 2019 Optimization of Cresyl-Stained Brain Micropunch Technique: Investigating the Genetic Regulation of Behavior in *Astatotilapia burtoni*. *Society for Integrative and Comparative Biology*, Tampa, FL (poster)

Grants and Fellowships

May 2026 **Center for Computational, Evolutionary, and Human Genomics Predoctoral Fellowship** Stanford University (\$20,561)

Mar 2026 **Young Investigator Travel Award** For travel, attendance, and presentation at the Society for Molecular Biology and Evolution (\$3,000)

Dec 2025 **Rosemary Grant Advanced Award** Society for the Study of Evolution (\$2,307)

Nov 2025 **Stanford EcoEvo Travel Award** For travel, attendance, and presentation at The Plant and Animal Genome Conference (\$750)

Jun 2025 **W. D. Hamilton Award – Finalist** Society for the Study of Evolution (\$500)

Jun 2021 **ADVANCE Scholar** Stanford Biosciences (\$5,900)

Jun 2020 **NIH Diversity Supplement to R15 GM129857** Reed College (funding for 14 months)

May 2020 **Helen Stafford Post-Baccalaureate Research Fellowship** Reed College (\$5,300)

Oct 2019 **Reed College Opportunity Grant** For travel, attendance, and presentation at the Society for Integrative and Comparative Biology 2020 (\$1,110)

Nov 2018 **Reed College Opportunity Grant** For travel, attendance, and presentation at the Society for Integrative and Comparative Biology 2019 (\$1,309)

Nov 2018 **Biology Undergraduate Student Travel Award** For travel to the Society for Integrative and Comparative Biology 2019 (\$500)

Honors and Awards

Jun 2023 **Excellence in Teaching Award** Stanford Biology Department

Apr 2022 **NSF Graduate Research Fellowship – Honorable Mention**

Mar 2021 **NSF Graduate Research Fellowship – Honorable Mention**

May 2020 **Commended for Excellence in Scholarship** Reed College (senior year)

Teaching Experience

Jan 2026–Mar 2026 **Course Coordinator – BIO 85: Evolution** Stanford University

Jan 2023–Mar 2023 **Teaching Assistant – BIO 85: Evolution** Stanford University

Jan 2022–Mar 2022 **Teaching Assistant – BIO 82: Genetics** Stanford University

Aug 2019–Dec 2019 **Lab Teaching Assistant – BIOL 342: Animal Behavior** Reed College

Mentorship

Aug 2025-Jan 2026 **Biology Preview Program - Mentor** Advised a prospective applicant to PhD programs on writing their CV and personal statement, applying to graduate programs, and interviewing. This student was successfully admitted to multiple PhD programs.

Jun 2024-Aug 2024 **Biology Summer Undergraduate Research Program** Mentored and worked alongside an undergraduate student on a project analyzing sperm morphology and motility in swordtail fishes. Taught this student how to code, collect data in a reproducible manner, basic microscopy, and science communication.

Professional Service

Nov 2025 **Reviewer** Journal of Heredity

Oct 2023 **Reviewer** Molecular Biology and Evolution

Sept 2023-2025 **Surf 'n' Turf Committee – Co-chair** Applied for and received \$6,700 in program funding over the course of two years to organize a cross-departmental symposium between Stanford Biology and Oceans departments. Managed multiple teams and coordinated logistics, budgeting, and marketing for the event.

Sept 2022-2023 **Surf 'n' Turf Committee – Member** Coordinated budgeting and catering logistics for a cross-departmental symposium between Stanford Biology and Oceans departments.

Mar 2022 **Reviewer** Proceedings of the Royal Society B: Biological Sciences

Sept 2021-2022 **Social Committee – Member** Organized social events for the Stanford Biology Department.

Skills

Bioinformatics Python (pandas, numpy, matplotlib), R/RStudio (tidyverse, tidymodels), Unix/BASH, experienced with HPC clusters and slurm; Genomic read processing and sequence alignment (seqkit, Cutadapt, FastQC, BLAST, minimap2, mummer, Cactus, Trimmomatic, HISAT2); long-read genome assembly (hifiasm); RNA-seq data analysis (kallisto, StringTie, DESeq2, Ballgown); Phylogenomics (RAxML, IQTree); GWAS (bcftools, PLINK).

Molecular biology High-molecular weight DNA extraction; DNA sequencing library preparation; RNA sequencing library preparation; cryosectioning, histology, and brain punch microdissection; qRT-PCR and primer optimization; ELISA; sterile technique and experience working with RNA.