Molly Schumer
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POSITIONS

Associate Professor, Stanford University, 9/2024 - present
Freeman Hrabowski Scholar, HHMI, 9/2023 - present
Assistant Professor, Stanford University, 9/2019 - 9/2024
Hanna H. Gray Fellow, HHMI, 9/2017 - 9/2023
Junior Fellow, Harvard Society of Fellows, 7/2016 - 8/2019
Postdoctoral researcher, Columbia University, 2/2016 - 1/2017

EDUCATION

BA (Phi Beta Kappa), Reed College, Portland, Oregon, 2005 - 2009.

PhD, Princeton University, Princeton, New Jersey, 2011 - 2016

AWARDS AND FELLOWSHIPS

2023	Early Academic Career Faculty Women's Forum Award, Stanford University
2023	Dean's Award for Distinguished Teaching in the School of Humanities and Science in the First Years, Stanford University
2022	Early Career Excellence Award, Society for Molecular Biology and Evolution
2021	Alfred P. Sloan Fellowship
2020	Alden H. and Winifred Brown Faculty Fellow, Stanford University
2019	Rosalind Franklin Young Investigator Award, Genetics Society of America
2018	Atwood colloquium: Rising Star in Evolutionary Biology
2017	Theodosius Dobzhansky Prize, Society for the Study of Evolution
2016	NSF Postdoctoral Research Fellowship in Biology (*declined*)
2015	Helen Hay Whitney Postdoctoral Fellowship (*declined*)
2013	Walbridge Award, Princeton Environmental Institute
2013	Student Research Award, Society for Animal Behavior
2013	Vern Parish Award, American Livebearer Association
2012	Graduate Research Award, Society for Systematic Biology
2012	Rosemary Grant Award, Society for the Study of Evolution
2011-2016	Centennial Fellowship in the Sciences and Engineering
2011-2014	National Science Foundation Graduate Research Fellowship
2009	Society for Integrative and Comparative Biology, Best Student Poster
2007	James F. and Marion L. Miller Foundation Research Award Recipient
2007	Goldwater Scholarship

FUNDED GRANTS

2025	National Science Foundation EDGE Functional Genomics - Revolutionizing the poeciliid model system for the genome editing age
2024	National Institutes of Health R35 (renewal) - The population genomics of hybridization: from genetic incompatibilities to genome evolution

2024 National Science Foundation EDGE Complex Multigenic Traits: Genetic and energetic basis of mitonuclear incompatibilities during speciation
2023 Freeman Hrabowski Scholars Award - Howard Hughes Medical Institute
2022 Stanford Tinker Seed Grant - Drivers of hybridization in rapidly changing freshwater ecosystems
2021 Pew Scholars Program - Unraveling the tangled web: the genetic consequences of hybridization
2021 Searle Scholars Program - Genetic collision: hybridization and its consequences
2020 Human Frontiers in Science Program Young Investigator Grant - Chance or curse? The consequences of hybridization in a changing world
2019 National Institutes of Health R35 - The population genomics of hybridization: from adaptation to genome evolution
2017 Hanna H. Gray Fellow - Howard Hughes Medical Institute
2017 Harvard University Milton Fund Awardee
2017 L'Oréal USA for Women in Science Fellow
2014-2016 National Science Foundation Doctoral Dissertation Improvement Grant

FUNDED GRANTS WITH SENIOR PERSONNEL ROLE

2021 Portuguese Foundation for Science and Technology - Genomics and proteomics of endemic Iberian freshwater fish (Senior Personnel)
2020 CPRIT High Risk Proposals for Cancer Research (Senior Personnel)
2018 ECR Catalyst grant - Linking deforestation to Schistosoma hybridization and low parasite clearance (Co-Investigator)

PUBLICATIONS

[+]Corresponding author
*Co-first authors
[§]Co-supervised work
Lab member

Pre-prints in review or revision

55. 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., Olmos-Santiago, N. S., Preising, G. A., Payne, C. Y., Cox, S. K. H., Hunnicutt, K. E., Madrzyk, M., Moran, B., Stigloher, C., Powell, D. L., Schartl, M., Gifford, C. A., Han, G.-Z., **Schumer, M.**[+] (2025). Insertion of an invading retrovirus regulates a novel color trait in swordtail fish. *bioRxiv*, doi: https://doi.org/10.1101/2025.11.07.687308. *In revision.*

54. Mikles, C.S., Pagniello, C.M.L.S., Bigal, E., Moran, B.M., Rooker, J.R., Ortega, A., de la Gándara, F., Maxwell, H., Schallert, R., Castleton, M.R., **Schumer, M.**, Stokesbury, M.J.W., Block, B. (2025). Ecological and evolutionary insights into the diversification of Atlantic bluefin tuna. *bioRxiv*. doi: https://doi.org/10.1101/2025.09.15.675172. *In revision*.

53. Moran, B.M.[+], Ramírez-Duarte, W.F., Powell, D.L., Yang, T.T.L., Gunn, T.R., Jofre-Rodríguez, G.I., Payne, C.Y., Iverson, E.N.K., Preising, G.E., Banerjee, S.M., Donny, A.E., Sood, R., Baczenas, J.J.,Vázquez Adame, G.M., Gutiérrez-Rodríguez, C.,

Rochman, C.M., **Schumer, M.**[§], Rosenthal, G.G.R.[§] (2025). Increased rates of hybridization swordtail fish are associated with water pollution. *bioRxiv*. doi: https://doi.org/10.1101/2025.04.22.649978. *In revision.*

Accepted peer-reviewed publications

52. Payne, C.[+], Ly, D., Rodriguez-Soto, R., Powell, D.L., Robles, N., Gunn, T.R., Baczenas, J.J., Bergman, A., Delclos, P., Pollock, A., Moran, B., Baker, J., Reznick, D., **Schumer, M.**[+] (2025). Recent evolution of large offspring size and post-fertilization nutrient provisioning in swordtails. *Proceedings of the Royal Society*, in press. Pre-print available at: *bioRxiv*. doi: https://doi.org/10.1101/2023.12.15.571831.

51. Kuster, S.A., **Schumer, M.**, Havird, J.C., and Sloan, D.B. (2025). Sensitivity of genome-wide tests for mitonuclear genetic incompatibilities. *Philosophical Transactions of the Royal Society B*, in press. Pre-print available at: *bioRxiv*. doi: https://doi.org/10.1101/2025.06.30.662443.

50. Haba, Y., Aardema, M. L., Afonso, M. O., [208 additional co-authors], Lawniczak, M. K. N., **Schumer, M.**, Rose, N., McBride, C. S. (2025). Ancient origin of an urban underground mosquito. *Science*. doi: 10.1126/science.ady4515.

49. Frayer, M.E., Robles, N.V., Rodríguez Barrera, M.J., Coughlan, J.M., **Schumer, M.**[+] (2025). The molecular evolutionary basis of species formation revisited. *Trends in Genetics*. doi: https://doi.org/10.1016/j.tig.2025.07.003.

48. Robles, N.V., Moran, B.M.M., Rodríguez Barrera, M.J., Jofre, G.I., Gunn, T., Iverson, E.N.K., Beskid, S., Baczenas, J.J., Sedghifar, A., Andolfatto, P., Brandvain, J., Havird, J.C., Rosenthal, G.G., **Schumer, M.**[+] (2025). Admixture mapping reveals evidence for multiple mitonuclear incompatibilities in swordtail fish hybrids. *Molecular Ecology*. doi: https://doi.org/10.1111/mec.70106.

47. Aguillon, S.M., Haase Cox, S.K., Langdon, Q.K., Gunn, T.R., Baczenas, J.J., Banerjee, S.M., Donny, A.E., Moran, B.M., Gutiérrez-Rodriguez, C., Ríos-Cárdenas, O., Morris, M.R., Powell, D.L.[+], **Schumer, M.**[+] (2025). Pervasive gene flow despite strong and varied reproductive barriers in swordtails. *Nature Ecology & Evolution*. doi: https://doi.org/10.1038/s41559-025-02669-9.

    Nature Ecology & Evolution Briefing - Hybridization contributes to reproductive isolation. doi: https://doi.org/10.1038/s41559-025-02654-2.

46. Dodge, T.O., Kim B.Y., Baczenas, J.J., Banerjee, S.M., Gunn, T.R., Donny, A.E., Given, L.A., 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-Rodriguez, C., Ríos-Cárdenas, O., Morris, M.R., Schartl, M., Powell, D.L.[+], **Schumer, M.**[+] (2024). Structural genomic variation and behavioral interactions underpin a balanced sexual mimicry polymorphism. *Current Biology*. doi: https://doi.org/10.1016/j.cub.2024.08.053.

    Current Biology perspective piece highlight - Evolution: A kit for fooling your rivals. doi: https://doi.org/10.1016/j.cub.2024.09.024.

45. Preising, G.A., Gunn, T.R., Baczenas, J.J., Pollock, A., Powell, D.L., Dodge, T., Machin

Kairuz, J.A., Savage, M., Lu, Y., Cummings, M., Thakur, S., Ríos-Cardenas, O., Morris, M., **Schumer, M.**$^{+}$ (2024). Recurrent evolution of small body size and loss of the sword ornament in Northern Swordtail fish. *Evolution*. doi: https://doi.org/10.1093/evolut/qpae124.

44. Langdon, Q., Groh, J., Aguillon, S., Powell, D.L., Gunn, T.R., Payne, C., Baczenas, J.J., Donny, A., Dodge, T.O., Du, K., Schartl, M., Ríos-Cárdenas, O., Gutiérrez-Rodriguez, C., Morris, M., **Schumer, M.**$^{+}$ (2024). Swordtail fish hybrids reveal that genome evolution is surprisingly predictable after initial hybridization. *PLoS Biology*. doi: https://doi.org/10.1371/journal.pbio.3002742.

43. Ramirez-Duarte, W., Moran, B., Powell, D.L., Bank, C., Sousa, V., Rosenthal, G.G., **Schumer, M.**, Rochman, C. (2024). Hybridization in the Anthropocene – how pollution and climate change disrupt mate selection in freshwater fish. *Biological Reviews*. doi: https://doi.org/10.1111/brv.13126.

42. Du, K., Lu, Y., Garcia-Olazabal, M., Walter, R.B., Warren, W.C., Dodge, T., **Schumer, M.**, Park, H., Meyer, A., Schartl, M. (2024). Phylogenomics analyses of all species of Swordtails (Genus Xiphophorus) highlights hybridization precedes speciation. *Nature Communication*s. doi: https://doi.org/10.1038/s41467-024-50852-6.

41. Hoge, C.R., de Manuel, M., Mahgoub, M., Okami, N., Fuller, Z.L., Banerjee, S., Baker, Z., Mcnulty, M., Andolfatto, P., Macfarlan, T.S., **Schumer, M.**, Tzika, A.C., Przeworski, M. (2024). Patterns of recombination in snakes reveal a tug of war between PRDM9 and promoter-like features. *Science*. doi: 10.1126/science.adj7026.

40. Moran, B.M.$^{+}$, Payne, C.Y., Powell, D.L., Iverson, E.N.K., Donny, A.E., Banerjee, S.M., Langdon, Q.K., Gunn, T., Rodriguez-Soto, R.A., Madero, A., Baczenas, J.J., Kleczko, K.M., Liu, F., Matney, R., Singhal, K., Leib, R.D., Hernandez-Perez, O., Corbett-Detig, R., Frydman, J., Gifford, C., Schartl, M., Havird, J.D., **Schumer, M.**$^{+}$ (2024). A Lethal Mitonuclear Incompatibility in Complex I of Natural Hybrids. *Nature*. doi: https://doi.org/10.1038/s41586-023-06895-8.

    Nature Briefing - Deadly mismatch between nuclear and mitochondrial genes in swordtail fish hybrids. doi: https://doi.org/10.1038/d41586-023-03842-5.

39. Thompson, K.A.$^{+}$, Brandvain, Y., Coughlan, J.M., Delmore, K.E., Justen, H., Linnen, C.E., Ortiz-Barrientos, D., Schneemann, H., **Schumer, M.**, Stelkens, R. (2024). The ecology of hybrid incompatibilities. *Cold Spring Harbor Perspectives on Speciation.* doi: 0.1101/cshperspect.a041440.

38. Dodge, T.O., Farquharson, K.A., Ford, C., Cavanagh, L., **Schumer, M.**, Belov, K., Hogg, C.J. (2023). Reference genomes of two extinct-in-the-wild reptiles from Christmas Island reveal distinct evolutionary histories and conservation insights. *Molecular Ecology Resources.* doi: https://doi.org/10.1111/1755-0998.13780.

37. Banerjee, S.M.$^{+}$, Powell, D.L., Moran, B.M., Ramírez-Duarte, W.F., Langdon, Q.K., Gunn, T.R., Vazquez, G., Rochman, C., **Schumer, M.**$^{+}$ (2023). Complex hybridization between deeply diverged fish species in a disturbed ecosystem. *Evolution.* doi: https://doi.org/10.1093/evolut/qpad019.

36. Zhang, J., Preising, G.A., **Schumer, M.**, Palacios J.A. (2023). CRP-Tree: A phylogenetic

association test for binary traits. *Journal of the Royal Statistical Society*: *Series C.* doi: https://doi.org/10.1093/jrsssc/qlad098.

35. Aguillon, S.M., Dodge, T.O., Preising, G.A., **Schumer, M.** (2022). Primer: Introgression. *Current Biology*. doi: https://doi.org/10.1016/j.cub.2022.07.004.

34. Payne, C.[+], Bovio, S., Powell, D., Gunn, T., Banerjee, S.M., Grant, V., Rosenthal, G.G., **Schumer, M**.[+] (2022). Genomic insights into variation in thermotolerance between hybridizing swordtail fishes. *Molecular Ecology.* doi: https://doi.org/10.1111/mec.16489.

    Editor's choice for "From the Cover"

33. Li, J., **Schumer, M.**, Bank, C. (2022). Inferring inter- and intrachromosomal Dobzhansky-Muller incompatibilities from imbalanced segregation of recombinant haplotypes in hybrid populations. *PLoS Genetics.* doi: https://doi.org/10.1371/journal.pgen.1010120.

32. *One of 25 papers republished in theme issue "Women in Speciation Research" for the 75th anniversary of the Society for the Study of Evolution.* **Schumer, M.**[+], Rosenthal, G., Andolfatto, P. (2022). How common is homoploid hybrid speciation? *Evolution.* doi: https://doi.org/10.1111/evo.12399.

31. Langdon, Q.K.[+], Powell, D.L., Kim, B., Banerjee, S.M., Payne, C., Dodge, T.O., Moran, B., Fascinetto-Zago, P., **Schumer, M.**[+] (2022). Predictability and parallelism in the contemporary evolution of hybrid genomes. *PLoS Genetics.* doi: https://doi.org/10.1371/journal.pgen.1009914.

30. Alves Cavassim, M.I., Baker, Z., Hoge, C., Schierup, M., **Schumer, M.**, Przeworski, M. (2022). PRDM9 losses in vertebrates are coupled to the loss of at least three other meiotic genes. *PNAS.* doi: https://doi.org/10.1073/pnas.2114401119.

29. Thompson, K.A., Peichel, C.L., Rennison, D.J., McGee, M.D., Albert, A.Y.K., Vines, T.H., Greenwood, A.K., Wark, A.R., Brandvain, Y., **Schumer, M.**, Schluter, D. (2022). Analysis of ancestry heterozygosity suggests that hybrid incompatibilities in threespine stickleback are environment dependent. *PLoS Biology.* doi: https://doi.org/10.1371/journal.pbio.3001469.

    PLoS Biology perspective piece highlight - One fish, two fish, red fish, dead fish. doi: https://doi.org/10.1371/journal.pbio.3001504

28. Powell, D., Payne, C.P., Banerjee, S., Keegan, M., Bashkirova, E., Cui, R., Andolfatto, P., Rosenthal, G.[§], **Schumer, M.** [§+] (2021). The Genetic Architecture of Variation in the Sexually Selected Sword Ornament and Its Evolution in Hybrid Populations. *Current Biology.* doi: https://doi.org/10.1016/j.cub.2020.12.049. [§]co-supervised

    Current Biology perspective piece highlight - Sexual Selection: A Cross–Sword Puzzle. doi: https://doi.org/10.1016/j.cub.2021.01.084.

27. Moran, B.*, Payne, C.*, Langdon, Q., Powell, D., Brandvain, Y., **Schumer, M.**[+] (2021). The genomic consequences of hybridization. *eLife*. doi: https://doi.org/10.7554/eLife.69016.

    F1000 recommended article

26. Powell, D.[+], Moran, B., Kim, B., Banerjee, S., Aguillon, S.M., Fascinetto-Zago, P.,

Langdon, Q., **Schumer, M.**$^{+}$ (2021). Two new hybrid populations expand the swordtail hybridization model system. *Evolution*. doi: https://doi.org/10.1111/evo.14337.

25. Powell, D., Garcia, M., Keegan, M., Reilly, P., Du, K., Diaz-Loyo, A., Banerjee, S., Blakkan, D., Reich, D., Andolfatto, P., Rosenthal, G., Schartl, M., **Schumer, M**.$^{+}$ (2020). Natural hybridization reveals incompatible alleles causing melanoma in swordtail fish. *Science.* doi:10.1126/science.aba5216.

    Science perspective piece highlight - Incompatibilities between emerging species. doi: 10.1126/science.abb8066

24. **Schumer, M.**$^{+}$, Powell, D., Corbett-Detig, R.$^{+}$ (2020). Versatile simulations of admixture and accurate local ancestry inference with mixnmatch and ancestryinfer. *Molecular Ecology Resources*. doi: https://doi.org/10.1111/1755-0998.13175.

23. Mateos M, Du K, Klopp C, Parrinello H, Garcia M, **Schumer, M.**, Jue N, Guiguen Y, Schartl M. (2019). Draft genome assembly and annotation of the Gila topminnow *Poeciliopsis occidentalis*. *Frontiers in Ecology & Evolution.* doi: https://doi.org/10.3389/fevo.2019.00404.

22. **Schumer, M.**$^{+}$, Xu, C., Powell, D., Durvasula, A., Skov, L., Holland, C., Blazier, J.C., Sankararaman, S., Andolfatto, P., Rosenthal, G.G.R, Przeworski, M.$^{+}$ (2018). Natural selection interacts with recombination to shape the evolution of hybrid genomes. *Science.* doi: 10.1126/science.aar3684.

    F1000 recommended article

21. Rosenthal, G.G.R, **Schumer, M.**, Andolfatto, P. (2018). Letter: How the manakin got its crown: A novel trait that is unlikely to cause speciation. *PNAS.* doi: https://doi.org/10.1073/pnas.1804061115.

20. **Schumer, M.**$^{+}$, Rosenthal, G.G.R., Andolfatto, P. (2017). What do we mean when we talk about hybrid speciation? *Heredity.* doi: https://doi.org/10.1038/s41437-017-0036-z.

    2018 Editor's choice

19. **Schumer, M.**$^{+}$, Powell, D., Cui, R., Delclos, P., Squire, M., Andolfatto, P., Rosenthal, G. (2017). Assortative mating and persistent reproductive isolation in hybrids. *PNAS.* doi: https://doi.org/10.1073/pnas.1711238114.

18. Baker, Z.*, **Schumer, M.***, Haba, Y., Holland, C., Rosenthal, G., Przeworski, M. (2017). Repeated losses of PRDM9-directed recombination despite the conservation of PRDM9 across vertebrates. *eLife.* doi: https://doi.org/10.7554/eLife.24133. *co-first authorship

17. Cui, R., Delclos, P., **Schumer, M.**, Rosenthal, G. (2017). Early social learning triggers neurogenomic expression changes in a swordtail fish. *Proceedings Royal Society B.* doi: https://doi.org/10.1098/rspb.2017.0701.

16. **Schumer, M.**, Brandvain, Y. (2016). Determining epistatic selection in admixed populations. *Molecular Ecology.* doi: https://doi.org/10.1111/mec.13641.

15. **Schumer, M.**$^{+}$, Cui, R., Powell, D., Rosenthal, G., Andolfatto, P. (2016). Ancient hybridization and genomic stabilization in a swordtail fish. *Molecular Ecology.* doi: https://doi.org/10.1111/mec.13602.

14. Cui, R., **Schumer, M.**, Rosenthal, G. (2016). Admix'em: A flexible framework for forward-time simulations of hybrid populations with selection and mate choice. *Bioinformatics.* doi: https://doi.org/10.1093/bioinformatics/btv700.

13. **Schumer, M**.*+, Cui, R.*, Rosenthal, G., Andolfatto, P. (2015). simMSG: an experimental design tool for high-throughput genotyping of hybrids. *Molecular Ecology Resources.* doi: https://doi.org/10.1111/1755-0998.12434. *co-first authorship

12. Ghosh, R., Bloom, J.S., Mohammadi, A., **Schumer, M.**, Andolfatto, P., Ryu, W., Kruglyak, L. (2015). Genetics of Intra-Species Variation in Avoidance Behavior Induced by a Thermal Stimulus in Caenorhabditis elegans. *Genetics.* doi: https://doi.org/10.1534/genetics.115.178491.

11. **Schumer, M.**+, Cui, R., Rosenthal, G., Andolfatto, P. (2015). Reproductive isolation of hybrid populations driven by genetic incompatibilities. *PLoS Genetics.* doi: https://doi.org/10.1371/journal.pgen.1005041.

10. **Schumer, M.**+, Cui, R., Powell, D., Dresner, R., Rosenthal, G., Andolfatto, P. (2014). High-resolution Mapping Reveals Hundreds of Genetic Incompatibilities in Hybridizing Fish Species. *eLife.* doi: http://dx.doi.org/10.7554/eLife.02535.

9. **Schumer, M.**+, Rosenthal, G., Andolfatto, P. (2014). How common is homoploid hybrid speciation? *Evolution.* doi: https://doi.org/10.1111/evo.12399.

8. Culumber, Z. W., **Schumer M**., Monks S., Tobler M. (2014). Environmental heterogeneity generates opposite gene-by-environment interactions for two fitness-related traits within a population. *Evolution.* doi: https://doi.org/10.1111/evo.12574.

7. Cui, R., **Schumer, M.**, Kruesi, K., Walter, R., Andolfatto, P., Rosenthal, G. (2013). Phylogenomics reveals extensive reticulate evolution in *Xiphophorus* fishes. *Evolution.* doi: https://doi.org/10.1111/evo.12099.

6. Renn, S.C.P. and **Schumer, M.** (2013). Genetic accommodation and behavioral evolution: insights from genomic studies. *Animal Behavior.* doi: https://doi.org/10.1016/j.anbehav.2013.02.012.

   F1000 recommended article

5. **Schumer, M.**+, Cui, R., Boussau, B., Walter, W., Rosenthal, G., Andolfatto, P. (2012). An evaluation of the hybrid speciation hypothesis for *Xiphophorus clemenciae* based on whole genome sequences. *Evolution.* doi: https://doi.org/10.1111/evo.12009.

4. Zhen, Y., Aardema, M.L., Medina, E.M., **Schumer, M.**, Andolfatto, P. (2012). Parallel molecular evolution in a herbivore community. *Science.* doi: 10.1126/science.1226630.

3. **Schumer, M.**+*, Birger, R.+*, Tantipathananandh, C., Aurisano, J., Maggioni, M., Mwangi, P. (2012). Infestation by a Common Parasite is Correlated with Ant Symbiont Identity in a Plant-Ant Mutualism. *Biotropica.* doi: https://doi.org/10.1111/btp.12038. *co-first authorship

2. **Schumer, M.**, Krishnakant, K., Renn, S.C.P. (2011). Comparative gene expression profiles for highly similar aggressive phenotypes in male and female cichlid fishes (*Julidochromis*). *Journal of Experimental Biology.* doi: https://doi.org/10.1242/jeb.055467.

1. Spengler, M., Kuropatwinski, K., **Schumer, M.**, Antoch, M. (2009). A serine cluster mediates BMAL1-dependent CLOCK phosphorylation and degradation. *Cell Cycle.* doi: 10.4161/cc.8.24.10273.

INVITED TALKS AND SEMINARS

2025 From molecular mechanism to evolution in nature: insights from swordtail fish. **NYU**. Department of Biology Seminar Series.

2025 From molecular mechanism to evolution in nature: insights from swordtail fish. **Brown University**. Center for Computational Molecular Biology Seminar Series.

2025 From molecular mechanism to evolution in nature: insights from swordtail fish. **Broad Institute**. Keynote speaker: Boston Evolution Supergroup Retreat.

2025 From molecular mechanism to evolution in nature. **UC Berkeley**. Integrative Biology Seminar Series.

2025 The evolution of mitonuclear incompatibilities in swordtail fish. Symposium Speaker, **Gordon Research Conference Speciation Meeting**.

2025 From molecular mechanism to evolution in nature. **University of Utah**. Department of Biology Seminar Series.

2024 Unraveling the tangled web: the impacts of hybridization in natural populations. **University of Montana**. Ecology & Evolution Seminar Series.

2024 Unraveling the tangled web: the impacts of hybridization in natural populations. **University of Chicago**. Ecology & Evolution Program Seminar Series.

2024 Unraveling the tangled web: the impacts of hybridization in natural populations. **Columbia University**. Biology Department Seminar Series.

2024 Unraveling the tangled web: the impacts of hybridization in natural populations. **University of British Columbia**. Zoology Department Seminar Series.

2023 Genetic and evolutionary mechanisms of pigmentation diversity in swordtail fish. **EMBO workshop: The Evolution of Animal Genomes**.

2023 The evolutionary origin of hybrid incompatibilities. Symposium Speaker: The Dark Side of Introgression. **Society for Molecular Biology and Evolution Annual Meeting**.

2023 The genetic architecture and mechanism of a lethal hybrid incompatibility. **UC Davis**. Integrative Genetics and Genomics Seminar Series.

2023 The evolution of reproductive isolation: insights from swordtail fish. **Harvard TH Chan School of Public Health**. Program in Quantitative Genomics Seminar Series.

2023 The evolution of reproductive isolation: insights from swordtail fish. **University of Cambridge.** Zoology Department Seminar Series.

2023 The genetic architecture of reproductive isolation: insights from swordtail fish. **University of Illinois, Urbana-Champaign**. Program in Ecology, Evolution, and Conservation Seminar Series.

2023 The genetic architecture of hybrid incompatibilities: insights from swordtail fish. **University of Georgia**. Genetics Seminar Series.

2022 The evolutionary origin of hybrid incompatibilities. **University of Oregon**. Biology Department Seminar.

2022 The evolutionary origin of hybrid incompatibilities. **UC Irvine**. Evolution Seminar Series.

2022 The mitochondria plays a large role in the evolution of hybrid incompatibilities. **Iowa State University**. Biology Department Seminar.

2022 Hybridization across scales – from gene interactions to population evolution. **Reed College**. Biology Department Seminar.

2022 Unraveling the tangled web: the evolutionary impact of hybridization. **Society for Molecular Biology and Evolution Awards Symposium**.

2022 Hybridization across a tree: learning from comparative systems in swordtail fish. **John Hopkins**. Biology Department Seminar.

2022 The evolution and development of a lethal hybrid incompatibility. **University of Wyoming**. Department of Botany Seminar.

2022 The evolution and development of a lethal hybrid incompatibility. **University of Missouri**. Biology Department Seminar. *Graduate Student selected speaker.*

2022 The evolution and development of a lethal hybrid incompatibility. **University of Colorado Boulder**. Ecology & Evolution Department Seminar.

2021 Hybridization across a tree: learning from comparative systems in swordtail fish. **UC Berkeley**. Speciation Group seminar series.

2021 The tangled tree of life: examining the genetic consequences of hybridization**. University of Basel**. Zoology and Evolution seminar series.

2021 The genetic architecture of a lethal hybrid incompatibility. **University of California Riverside**, Department of Evolution, Ecology and Organismal Biology.

2021 The genetic architecture of two naturally occurring hybrid incompatibilities. **University of Washington**, Department of Genome Sciences.

2021 Unraveling the tangled web: the evolutionary impact of hybridization. **University of Chicago**, Department of Ecology & Evolutionary Biology.

2021 The tangled tree of life: examining the genetic consequences of hybridization. **Cornell University**, Department of Ecology & Evolutionary Biology.

2021 The genetic basis of a lethal incompatibility between hybridizing swordtail species. Keynote speaker: **Behavior, Ecology, and Evolution of Poeciliid Fishes**.

2020 The tangled tree of life: examining the genetic consequences of hybridization. **Colorado State University**, Biology Department Seminar.

2020 Ecological and genetic drivers of hybrid incompatibility. **University of Texas at Austin**, Integrative Biology Department Seminar.

2020 Genetic architecture of a naturally occurring hybrid incompatibility. Center for Evolutionary and Human Genomics Symposium, **Stanford University**.

2020 Genetic architecture of a naturally occurring hybrid incompatibility. **Hopkins Marine Station**.

2020 Ecological and genetic drivers of hybrid incompatibility. **University of California at Santa Cruz**, Ecology & Evolution Department Seminar.

2019 Genetic architecture of a naturally occurring hybrid incompatibility. **University of California at Berkeley**, Computational Biology Seminar.

2019 Unraveling the tangled web: the evolutionary impact of hybridization. **University of California at Berkeley**, Museum of Vertebrate Zoology Department Seminar.

2019 Genetic architecture of a naturally occurring hybrid incompatibility. **University of Michigan**, Department of Ecology and Evolution Seminar.

2019 Genetic architecture of a naturally occurring hybrid incompatibility. **University of California at Davis**, Population Biology Department Seminar.

2019 Hybridization and evolution: from genes to genomes. **Instituto Gulbenkian de Ciencia** Departmental Seminar, Lisbon, Portugal.

2019 The origin and evolution of a hybrid incompatibility. From mutation to speciation. **Collége de France**, Paris, France.
2019 Evolution of the hybrid genome: insights from swordtail fish. **University of Rochester**, Biology Departmental Seminar.
2019 Natural selection on hybrid genomes: insights from swordtail fish. **Duke University**, Biology Departmental Seminar. *Graduate student selected speaker*.
2019 The origin and evolution of a hybrid incompatibility. **Speciation Gordon Research Conference**, Ventura, California (Invited speaker - Along the speciation continuum symposium)
2019 Genome evolution in replicated hybrid zones. **Yale University**, Ecology & Evolution Departmental Seminar.
2019 Evolution of the hybrid genome: insights from swordtail fish. **University of Maryland**, Biology Departmental Seminar.
2018 Selection shapes the hybrid genome. **Texas A&M University**, Biology Departmental Seminar.
2018 Evolution and reproductive isolation in hybrid populations. **Texas A&M University**, Ecology & Evolution Departmental Seminar.
2018 The evolution of hybrid genomes and populations: insights from swordtail fish. **Evolution 2018**, Montpellier, France (Invited speaker – Hybridization symposium).
2018 The evolution of hybrid genomes and populations: insights from swordtail fish. **University of Toronto**, Atwood Colloquium series.
2017 Hybridization shapes the evolution of genomes and species: insights from swordtail fish. Dobzhansky award talk, **Evolution 2017**.
2017 Selection shapes hybrid genome evolution: insights from swordtail fish. **Gordon Research Conference 2017**.
2017 Natural selection and local recombination rates shape the genome evolution of swordtail hybrids. **Biology of Genomes 2017**.
2016 Hybridization shapes the contemporary evolution of swordtail fish. **University of British Columbia**, Biodiversity seminar series.
2016 Hybridization shapes the evolutionary history of swordtail fish. **Brooklyn College**, Biology department seminar.
2015 Hybridization, selection, and speciation in swordtail fish. **University of California at Davis**, Center for Population Biology seminar.
2015 Reproductive isolation of hybrid populations driven by genetic incompatibilities. **New York Area Population Genomics Workshop 2015**.
2014 The role of hybrid incompatibilities in hybrid zone structure. **Evolution 2014**.
2014 High-resolution mapping reveals hundreds of genetic incompatibilities in hybridizing fish species. **Biology of Genomes 2014**.
2013 Genome-wide analysis of replicate hybrid zones between the swordtail fish *Xiphophorus birchmanni* and *X. malinche*. **Evolution 2013**.
2011 Comparative gene expression profiles for highly similar aggressive phenotypes in male and female cichlid fishes. **Behavior 2011**.

TEACHING

Biology 85 – Evolution: 2021-present. Introductory Evolution course for Stanford undergraduates.

Building Up Developing Scientists (bioBUDS): 2021-present. Course co-organized with graduate students focused on working with undergraduates to navigate their first research experiences in Biology and build skill sets necessary for research careers.

Biology 233 – Genetics, Development, and Evolution of Pigmentation: 2022. Advanced integrative biology course for Stanford undergraduates.

PROFESSIONAL SERVICE

Biology of Genomes Population Genetics Session co-chair: 2017
NSF DEB Evolutionary Processes Review Panel: 2018
Scientific Advisory Board CICHAZ field station: 2019-present
Genetics Society of America Allied Genetics Conference Session chair: 2020
Genetics Society of America James Crow Award Committee: 2020
NIH discussant – Validation of Animal Models for Biomedical Research: 2020
National Academy of Sciences Red Wolf Strategy Meeting: 2020
NSF DEB ad hoc reviewer: 2020, 2021
Society for the Study of Evolution – Graduate Research Excellence Grants Reviewer: 2021
Hanna Gray Fellows Career Panel: 2021
Reviewing: *Science, eLife, PLoS Genetics, Nature Ecology & Evolution, Nature Communications, Cell, Current Biology, PNAS, Evolution, Evolution Letters, Molecular Ecology, Journal of Evolutionary Biology, Trends in Ecology & Evolution*
HHMI Transparent and Accountable Peer Review Program: 2023-2024
Clubes de Ciencia Bioinformatics course leader: 2025

DEPARTMENT AND UNIVERSITY SERVICE

Co-organizer Biology Preview Program (see below): 2020-present
Department Seminar Committee: 2020-2023
Graduate Admissions Committee (EcoEvo): 2019-2020, 2022-2023
Biology First Year Facilitator: 2019-2023
Return to Research Committee: 2020-2021
Graduate Studies Committee: 2020-2021
Stanford Center for Evolutionary and Human Genomics fellowship review committee: 2020
Stanford FAST program faculty support: 2020
Stanford ADVANCE program mentor: Summer 2020, Summer 2021, Summer 2023
Stanford Biology Ambassador at ABRCMS 2022
Stanford Animal Care and Use Committee 2025-present

OUTREACH

Biology Preview Program: Co-organizer, 2020-present. Developed a new workshop focused on increasing representation of underrepresented groups in science in Stanford's Biology PhD program. This program invites prospective students from diverse backgrounds to participate in a two-day workshop on navigating the application process, connecting with faculty, communicating their research, among other topics. We have worked with 288 students over the past four years. Approximately 20% of admitted students to Stanford Biology in the past three years have been preview participants. In 2023, we secured funding to offer longer-term mentorship to Biology Preview Program participants.

Aspiring Student Program: Science program instructor, 2018-2019. Developing lab-based activities for high school students and implementing them in Spanish at a language center with students from East Boston High School. These activities included dissecting owl pellets, testing herbicide resistance in wild type and round-up resistant soybeans, tracking the *Drosophila* life cycle, and culturing bacteria from swabs taken around the center.

Prison Teaching Initiative: Instructor and course leader, 2012-2016. This program offers college-level courses to prison inmates to help them earn their associate's degree while in prison. Courses taught include environmental science (four semesters, two semesters as course leader) and plant ecology and evolution (three semesters).

Teach for America: 6th grade science teacher in Clarksdale, MS, 2009-2011.

MENTORING

Undergraduate student mentoring:

Mackenzie Keegan, Northeastern 2019
Joseph Lim, Stanford 2019-2020
Jose Angel Machin Kairuz, Stanford 2021-2022
Alexa Pollock, Stanford 2021-2025
Sophia Haase Cox, Stanford 2022-2025
Rebecca Ann Rodriguez Soto, Stanford 2022-2025
Jalena Wouters, UC Davis 2023-2024
Terrance Yang, Stanford 2023-2025
Lyle Given, Stanford 2023-present
Marta Pambukhchyan, Stanford 2024
Anthony Sifuentes, Stanford 2025
Madison Murata, Stanford 2025-present

Graduate student mentoring:

Cheyenne Payne, Stanford University PhD student, 2019-2023. Current position: Postdoctoral scholar at UCSC.
Ben Moran, Stanford University PhD student, 2019-2024. *NSF GRFP & Knight-Hennessy fellow.* Current position: Postdoctoral scholar at UC Davis.
Tris Dodge, Stanford University PhD student, 2020-present. *NSF GRFP fellow.*
Victoria Grant (co-advisor), Stanford University PhD student, 2020-present. *NSF GRFP Fellow, NIH training grant recipient, & Stanford DARE Fellow.*
Gabe Preising, Stanford University PhD student, 2021-present. *NSF GRFP honorable mention.*
Nadia Haghani, Stanford University PhD student, 2023-present. *NSF GRFP Fellow & NIH training grant recipient.*
Nim Robles, Stanford University PhD student, 2023-present. *NSF GRFP Fellow & HHMI Gilliam Fellow.*
Robert Hall (co-advisor), Stanford University PhD student, 2024-present. *NSF GRFP Fellow.*
Will Pangburn, Stanford University PhD student, 2024-present.
Sophia Haase Cox, Stanford University PhD student, 2025-present. *NSF GRFP honorable mention.*

Postdoctoral scholar mentoring:

Dr. Quinn Langdon, 2019-2023. *NSF Rules of Life Postdoctoral Fellow & CEHG Postdoctoral fellow.* Current position: Staff Scientist at UCSF.

Dr. Daniel Powell, 2019-2024. Current position: Assistant Professor at LSU.
Dr. Stepfanie Aguillon, 2021-2024. *Stanford Science Fellow.* Current position: Assistant Professor at UCLA.
Dr. Ken Thompson, 2021-2024. *Human Frontiers in Science Program Postdoctoral Fellow.* Current position: Mitacs Elevate Fellow.
Dr. Kelsie Hunnicutt, 2024-present.
Dr. Paola Fascinetto-Zago, 2025-present.

Graduate student dissertation committees: Ellie Armstrong (Stanford), Erik Iverson (Univeristy of Texas at Austin), Matthew Clark Farnitano (University of Georgia at Athens), Mateo Garcia (Texas A&M University), Lisa Couper (Stanford), Julia Harencar (UC Santa Cruz), Margaret Antonio (Stanford), Chloe Mikles (Stanford), Anastasia Lyulina (Stanford), Laura Leventhal (Stanford), G. Adam Reeves (Stanford), Zhiru Liu (Stanford), Sofia Beskid (Stanford), James Hemker (Stanford), Mila Pamplona Barbosa (Stanford), Julie Zhu (Stanford), Chloe Mikles (Stanford & Hopkins Marine Station), Zhen Zhen Ma (Stanford), Austin Katzer (Stanford), Raksha Doddabele (Stanford), Georgia Mies (University of Pennsylvania).

Undergraduate major advisees: Erin Epp, Diego Rafael Perez, Rebecca Ann Rodriguez Soto, David Candes, Sydney Metz, Lauren Taylor, Emma Klemperer, Lyle Given.