STEPHEN J GAUGHRAN

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CURRENT EMPLOYMENT

Assistant Adjunct Professor 01/2025 – Present
Department of Integrative Biology
University of California, Berkeley, Berkeley, CA

EDUCATION

PhD in Ecology & Evolutionary Biology 2021
Yale University
Dissertation: "The effects of demography and selection on genome evolution in pinnipeds"
Advisors: Gisella Caccone & Jeffrey Powell

MRes in Marine Mammal Science 2013
University of St Andrews – Scottish Oceans Institute
Dissertation: "Variability at MHC class I genes in the Cap Blanc population of the critically endangered Mediterranean monk seal" (with distinction)
Advisor: Ailsa Hall

BA in Environmental Biology 2011
Columbia University
Thesis: "Identifying the origins of loggerhead turtles by-caught by the Spanish fishing fleet"
Advisor: Lluís Cardona (University of Barcelona)

EMPLOYMENT AND RESEARCH EXPERIENCE

NSF Postdoctoral Research Fellow 03/2021 – 12/2024
Department of Ecology & Evolutionary Biology
Princeton University, Princeton, NJ

Program Manager 09/2013 – 08/2015
American Museum of Natural History, New York, NY
Sackler Institute for Comparative Genomics

PUBLICATIONS

PRE-SUBMISSION

1. **Gaughran SJ**, Downie AE, Ripley-Dunlap K[†], Loke K[†], Hansen C, Yu E[†], Whitmer ER, Field CL, Duignan P, Martinez ME, Beltran R, vonHoldt B, Gulland F, Graham AL. Population genetic origins of a severe immunopathology in northern elephant seals.
2. Downie AE, Beltran R, vonHoldt B, Graham AL, **Gaughran SJ**. Early life immunological sex differences in an extremely dimorphic mammal.

IN REVIEW

3. **Gaughran SJ**, Karamanlidis A, Dendrinos P, vonHoldt B, Caccone A, Amato G. Climate change and human interactions drove the long-term decline of the Mediterranean monk seal. (submitted)
4. Yu E[†], DeCandia A, Graham AL, Whitmer E, Field C, vonHoldt B, **Gaughran SJ**. Sexual dimorphism and host genetics shape the gut microbiome of northern elephant seal pups. (in revision at *Environmental Microbiology Reports*)
5. Ghaffari N, Roy P, vonHoldt BM, **Gaughran SJ.** Identifying genome-wide methylation patterns and distinguishing among seal species using machine learning. (in revision at *IJMS*)
6. Townsend JP, **Gaughran SJ**, Hassler, HB, Fisk JN, Nagib M, Wu Y, Yaning W, Zheng W, Galvani

AP & Dornburg A. 2023. Purifying selection and adaptive evolution proximate to the zoonosis of SARS-CoV-1 and SARS-CoV-2. *bioRxiv*, 2023-08. (in revision at *Genome Biology & Evolution*)

PUBLISHED

7. vonHoldt BM, James M, **Gaughran SJ**, DeCandia AL, Koepfli KP, Flores D, Songsasen N, Brzeski KE, Jensen EL. Evolving conservation: The role of unconventional approaches to restore contemporary vertebrate population and genomic biodiversity. (in review at *Journal of Heredity*)
8. Amaral AR, **Gaughran SJ**, Giakoumis MI, Willson A, Minton G, Baldwin R, Sarrouf Wilson M, Al Harthi S, Al Jabri A, Collins T, Van Waerebeek K, Rosenbaum HC. 2026. A whale apart: further evidence for genetic isolation of Arabian Sea humpback whales from other recognized subspecies. *Frontiers in Marine Science*, *13*, 1735173.
9. Marshall CA, Halo J, Van Why K, Loera Y, Tennenbaum SR, Burton C, Di Landro A, Dominguez D, Duncan D, Machado M, Posada C, **Gaughran SJ**, Lichak M, Brzeski K, Heppenheimer E, vonHoldt B. 2026. Signatures of the Anthropocene: Population Genomic Structure Detected in Pennsylvania Coyotes. *Ecology and Evolution*, *16*(3), e73216.
10. Ochoa A, **Gaughran SJ**, Gray R, Fusco NA, Weston JN, Conrad CN, Poulakakis N, Miller JM, Caccone A, Jensen EL. 2026. Integration of ultra-low coverage whole-genome sequences for reconstructing the evolutionary history of Galapagos giant tortoises. *Royal Society of London. Proceedings B. Biological Sciences*, *293*.
11. **Gaughran SJ**, Gray R, Jones M, Fusco N, Ochoa A, Miller JM, Poulakakis N, de Queiroz K, Caccone A & Jensen EL. 2025. Whole-genome sequencing confirms multiple species of Galapagos giant tortoises. *Evolution* 79(2):296-308.
12. **Gaughran SJ**, vonHoldt B. 2022. Pleistocene parades of carnivores into North America. *Molecular Ecology* 31(24):6387-6389.
13. Caragiulo A, **Gaughran SJ**, Duncan N, Nagy C, Weckel M, vonHoldt B. 2022. Coyotes in New York City carry variable genomic dog ancestry and influence their interactions with humans. *Genes* 13(9):1661.
14. Mohr DW, **Gaughran SJ**, Paschall J, Naguib A, Pang AW, Dudchenko O, Aiden EL, Church DM, Scott AF. 2022. A Chromosome-Length Assembly of the Hawaiian Monk Seal (*Neomonachus schauinslandi*): A History of "Genetic Purging" and Genomic Stability. *Genes* 13(7):1270.
15. Jensen EL*, **Gaughran SJ***, Fusco NA, Poulakakis N, Tapia W, Sevilla C, Málaga J, Mariani C, Gibbs JP, Caccone A. 2022. The Galapagos giant tortoise *Chelonoidis phantasticus* is not extinct. *Communications Biology* 5(1):546.
16. Jensen EL, **Gaughran SJ**, Garrick RC, Russello MA, & Caccone A. 2021. Demographic history and patterns of molecular evolution from whole genome sequencing in the radiation of Galapagos giant tortoises. *Molecular Ecology 30*(23):6325-6339.
17. Karamanlidis AA, Skrbinšek T, Amato G, Dendrinos P, **Gaughran SJ**, Kasapidis P, Kopatz A, Stronen AV. 2021. Genetic and demographic history define a conservation strategy for earth's most endangered pinniped, the Mediterranean monk seal. *Scientific Reports 11*(1):1-10.
18. Quesada V, Freitas-Rodríguez S, … **Gaughran SJ**, … Caccone A, López-Otín C. 2019. Giant tortoise genomes provide insights into longevity and age-related disease. *Nature Ecology & Evolution* 3(1):87-95.
19. **Gaughran SJ**, Quinzin M, Miller JM, Garrick R, Edwards D, Russello M, Poulakakis N, Ciofi C, Beheregaray L, Caccone A. 2017. Theory, practice and the conservation in the age of genomics: the Galápagos giant tortoise as a case study. *Evolutionary Applications* 11(7): 1084-1093.
20. **Gaughran SJ***, Pless E*, Stearns SC. 2016. How elephants beat cancer. *eLife* 5: e21864
21. Karamanlidis AA*, **Gaughran SJ***, Aguilar A, Dendrinos P, Huber D, Pires R, Schultz J, Skrbinsek T, Amato G. 2016. Shaping species conservation strategies using mtDNA analysis: The case of the elusive Mediterranean monk seal (*Monachus monachus*). *Biological Conservation* 193:71-79
22. DeCandia A[†], **Gaughran SJ**, Caragiulo A, Amato G. 2016. A novel molecular method for noninvasive sex identification of order Carnivora. *Conservation Genetics Resources* 8(2):119-121

23. Clusa M, Carreras C, Pascual M, **Gaughran SJ**, Piovano S, Avolio D, Ollano G, Fernández G, Tomás J, Raga JA, Aguilar A, Cardona L. 2016. Potential bycatch impact on distinct sea turtle populations is dependent on fishing ground rather than gear type in the Mediterranean Sea. *Marine Biology* 163(5):1-10
24. Clusa M, Carreras C, Pascual M, **Gaughran SJ**, Piovano S, Giacoma C, Fernández G, Levy Y, Tomás J, Raga JA, Maffucci F, Hochscheid S, Aguilar A, Cardona L. 2014. Fine-scale distribution of juvenile Atlantic and Mediterranean loggerhead turtles (*Caretta caretta*) in the Mediterranean Sea. *Marine Biology* 161:509-519
25. Naro-Maciel E, **Gaughran SJ**, Putman NF, Amato GA, Arengo F, Dutton PH, McFadden KW, Vintinner EC, Sterling EJ. 2014. Predicting connectivity of green turtles at Palmyra Atoll, Central Pacific: a focus on mtDNA and dispersal modelling. *Journal of the Royal Society Interface* 11:20130888

(**Co-first authors;* †*undergraduate trainee*)

INVITED TALKS

"Immunogenetic consequences of a population bottleneck in northern elephant seals"
Comparative Physiology | American Physiology Summit 2025
"Immunological adaptations to aquatic life in marine mammals"
Princeton University Developmental Biology Colloquium | December 15, 2023
"Temporal genomic insights into extinction and survival"
American Museum of Natural History Techniques Tuesday | November 14, 2023
"Molecular insights into the evolution of deep-diving seals"
Fordham Biological Sciences Department Colloquium Series | December 7, 2022

PRESENTATIONS

"Origins and consequences of the long-term decline of the Mediterranean monk seal" (Talk)
Society for Marine Mammalogy Biennial Conference 2026, San Juan, Puerto Rico
"Building species-wide genomic resources for the endangered Hawaiian monk seal" (Talk)
Hawai'i Conservation Conference 2026, Honolulu, Hawai'i
"Temporal genomics of a population bottleneck in northern elephant seals" (Talk*)
**Awarded Best Postdoc Talk*
SMBE Satellite Meeting on Ancient DNA 2024, Dublin, Ireland
"Genomic lessons on extinction from the Caribbean monk seal" (Poster)
Gordon Research Conference: Ecological & Evolutionary Genomics 2023, Smithfield, RI
"Immunogenomic adaptations to deep diving in marine mammals" (Poster)
Society for Molecular Biology and Evolution 2023, Ferrara, Italy
"Molecular adaptations to deep diving and aquatic life in phocid seals" (Talk)
Society for Marine Mammalogy Biennial Conference 2022, Virtual
"Uncovering historical declines in endangered monk seals" (Talk)
Society for Marine Mammalogy Biennial Conference 2019, Barcelona, Spain
"Measuring mutation accumulation in endangered and abundant pinnipeds" (Workshop talk)
Society for Marine Mammalogy Biennial Conference 2019, Barcelona, Spain
"Applying population genomic modelling in conservation" (Talk)
Student Conference on Conservation Science – New York 2019, New York, NY
"Mutation accumulation in endangered and abundant seals" (Talk)
Evolution 2019, Providence, RI
"Relating mutation rate and pattern to demography in seals" (Talk)
Molecular Ecology and Fisheries Group Meeting, Bangor University, Wales (2019)
"Genetic load in endangered and abundant seals" (Talk)

Graduate Student Symposium 2019 – Ecology & Evolutionary Biology, New Haven, CT

"Mutation accumulation in endangered monk seals" (Talk)

Graduate Research in Ecology, Evolution and Behavior Meeting 2019, Princeton, NJ

"Old and new population declines in the endangered monk seals" (Talk – *Awarded "Best Talk"*)

Graduate Student Symposium 2018 – Ecology & Evolutionary Biology, New Haven, CT

"When does population size matter? An empirical test of mutation accumulation in seals" (Poster)

Evolution 2018, Montpellier, France

"Conserving tortoises, conserving genomes" (Talk)

Student Conference on Conservation Science – New York 2017, New York, NY

"Evidence of selection in extant and extinct monk seals" (Poster)

Evolution 2017, Portland, OR

"Diversity of immune-related MHC class I genes in the Mediterranean monk seal" (Talk)

Society for Marine Mammalogy Biennial Conference 2015, San Francisco, CA

"Age-related variation in pattern and coloration of green turtles foraging at Palmyra Atoll" (Poster)

International Sea Turtle Symposium 2014, New Orleans, LA

"Genetic analysis reveals diverse natal origins of green turtles foraging at Palmyra Atoll" (Talk)

Student Conference on Conservation Science 2013, Cambridge, UK

"DNA barcodes and population distribution of green turtles foraging at Palmyra Atoll" (Poster)

Student Conference on Conservation Science 2012, New York, NY

FELLOWSHIPS, AWARDS AND HONORS (TOTAL: $384,185)

Princeton Catalysis Initiative Award (co-PI; 2023)	$120,000
Society for Molecular Biology and Evolution Satellite Conference Award (2023)	$35,300
National Science Foundation Postdoctoral Research Fellowship in Biology (2021)	$207,000
Theodore Roosevelt Memorial Fund – AMNH (2020)	$1400
Yale Graduate School of Arts and Sciences Dean's Fund for Colloquia (2019)	$395
Yale Institute for Biospheric Studies Doctoral Dissertation Improvement Grant (2019)	$5000
Lerner Gray Fund for Marine Research – AMNH (2018)	$2000
Yale Institute for Biospheric Studies Doctoral Pilot Grant (2017)	$2600
Yale Ecology and Evolutionary Biology Chair's Fund (2016)	$1300
Scotland's Saltire Scholarship (2012)	£2000
National Science Foundation Research Experience for Undergraduates Award (2009)	$6000

TEACHING EXPERIENCE

University of California, Berkeley Courses

Evolutionary Medicine | *IB169*

Undergraduate Research Apprentice Program | *UGIS 192*

Yale University (Teaching Assistant)

Introduction to Ecology & Evolution | BIOL104

Evolution and Medicine | EEB235

Ecology & Evolution of Infectious Disease | EEB228

Conservation Biology | EEB115

Yale University (Course organizer)

Colloquium on Molecular Evolution at Yale (GSAS-Funded Colloquium)

Workshops (Leader)

Applications of museum genomics to biodiversity conservation

Student Conference on Conservation Science | *New York, NY (2022)*

Population Genomics for Conservation Science

Student Conference on Conservation Science | New York, NY (2019)
Designing, Applying, and Interpreting Conservation Genetics Studies
Student Conference on Conservation Science | New York, NY (2017, 2018)

Yale Center for Teaching and Learning Training Workshops (Participant)
Fundamentals of Teaching in the Sciences – Series (Fall 2015)
Workshop for Writing Course Teaching Fellows (Fall 2016)
Advanced Teaching Workshops:
Preparing & Delivering a Lecture (Fall 2016)
Teaching and Mentoring in the Lab (Fall 2018)
Inclusive Assessment Practices (Fall 2018)

Guest Lectures
"Extinction: a microevolutionary perspective" (December 1, 2025)
UC Berkeley IB C160, Evolution
"Vignettes from evolutionary immunology" (March 12, 2025 | November 12, 2025)
UC Berkeley IB77, Integrative Human Biology
"Eco-evolutionary thinking in comparative immunology" (December 4, 2023 | November 18, 2024)
Princeton EEB327, Immune Systems: From Molecules to Populations
"Molecular adaptations to deep diving in marine mammals" (May 4, 2022 | April 24, 2023)
UC Santa Cruz BIOE126, Biology of Large Marine Vertebrates
"Infectious disease, evolution, and conservation" (November 8, 2022)
Princeton EEB309, Evolutionary Biology
"Evolutionary genomics" (April 19, 2021)
Princeton EEB331, Molecular Ecology
"Problems of Small Populations" (October 23, 2017 | October 21, 2019)
Yale EEB115, Conservation Biology
"The Role of Infectious Disease in Wildlife Conservation" (April 10, 2017)
Yale EEB228, Ecology and Evolution of Infectious Diseases

Additional Experiences
Conservation Biology Collections Tours | Peabody Museum (Fall 2017, Fall 2018, Fall 2019)

SERVICE

UC Berkeley IB Seminar Committee
Seminar coordinator (2025-Present)
UC Berkeley IB Community and Safety Committee
Faculty representative (2025-Present)
Princeton EEB Departmental Climate Committee
Postdoc representative (2021-2022)
Yale Graduate Student Assembly
Chair (2018-2019)
Chair of Academic & Professional Development Committee (2017-2018)
Department Representative (2016-2019)
Yale Graduate School of Arts and Sciences Executive Committee
Graduate Student Member (2018-2019)
Yale Graduate Student oSTEM
Treasurer | LGBTQ+ Advocacy (2016-2021)
Yale Student Life – Student Advisory Committee
Graduate Student Advisor (2017-2018)
Columbia University Earth Institute Advisory Council
Student Advisory Board Member (2008-2009)

SCIENCE OUTREACH

Princeton University Molecular Biology Outreach Program (2024)
Invited talk: "Oceanic Lifelines: the biology of survival, adaptation, and extinction in marine mammals"
Princeton University | Princeton, NJ

California Academy of Sciences "Night School" (2023)
Invited talk: "Genetic rediscovery of the Fernandina Galapagos giant tortoise"
California Academy of Sciences | Virtual

Skype a Scientist (2020)
Invited talk: "Evolutionary genetics in conservation and society"
Southington High School | Southington, CT

Yale Evolution Outreach Group (2018-2020)
Yale University | New Haven, CT

Seacoast Science Center Educator Workshop (2019)
Invited talk: "Using Genes and Genomes to Guide Marine Mammal Conservation"
Seacoast Science Center | Rye, NH

YIBS Research Photo Exhibit (2018)
Yale School of Forestry | New Haven, CT

Milstein Science Series: Sea Turtles (2015)
American Museum of Natural History | New York, NY