

Zachary JC Tobias

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PROFESSIONAL APPOINTMENTS

Postdoctoral Scholar **May 2024 – present**
 Supervisor: Prof. Diana Rennison
 Department of Ecology, Behavior, and Evolution
 University of California - San Diego, La Jolla, CA

Lecturer II **January 2025 – present**
 Department of Biology
 University of San Diego, San Diego, CA

EDUCATION

PhD in Biological Oceanography **September 2018 – April 2024**
 MIT-Woods Hole Oceanographic Institution Joint Program
 Cambridge and Woods Hole, MA
 Dissertation: “Genomic and physiological adaptation to temperature in the invasive golden star tunicate, *Botryllus schlosseri*” [link](#)

Master of Science in Zoology **December 2015 – December 2016**
 University of Otago, Dunedin, New Zealand
 Thesis: “Evolutionary genetics of two host-parasite systems on New Zealand’s South Island” [link](#)
 Awarded with Distinction, Mark: A

Bachelor of Arts in Biology **September 2008 – May 2012**
 Lewis & Clark College, Portland, OR
 Overall GPA: 3.55 – Biology GPA: 3.73

RESEARCH EXPERIENCE

Postdoctoral Research **May 2024 – present**
 Department of Ecology, Behavior, and Evolution, Supervisor: Prof. Diana Rennison
 University of California - San Diego

- Investigate determinants of evolutionary parallelism in the threespine stickleback, *Gasterosteus aculeatus*, using genomic, transcriptomic, and morphometric approaches.

Doctoral Research **September 2018 – April 2024**
 Department of Biology, Advisor: Dr. Carolyn Tepolt
 Woods Hole Oceanographic Institution

- Investigate thermal adaptation and phenotypic plasticity in the invasive tunicate *Botryllus schlosseri* using population genomics and physiological experiments
- Study patterns of gene expression in response to parasite infection among closely related species of mud crabs

Lab Volunteer **February 2017 – June 2018**
 Funk Lab, Department of Biology
 Colorado State University

- Audit Landscape Genetics Distributed Graduate Seminar and work on collaborative research project modeling genetic connectivity of Arizona treefrog (*Hyla wrightorum*)
- Assist in tailed frog (*Ascaphus* spp.) local adaptation genomics project
- Assist with PhD student’s stream insect meta-barcoding project

Master's Research**December 2015 – December 2016**

Department of Zoology, Advisor: Prof. Robert Poulin
University of Otago

- Investigate phylogenies of NZ hairworms (Nematomorpha) and the mermithid nematode *Thaumamermis zealandica*
- Compare population genetics/phylogeography of host and parasite in both systems
- Identify and describe new species of hairworm

Microscopy Coordinator**November 2013 – June 2015**

Department of Biology
Lewis & Clark College

- Train students and researchers on wide-field fluorescence microscope, laser-scanning confocal fluorescence microscope, and Visionary Digital macro-photography system
- Perform routine maintenance and schedule servicing

Laboratory Technician**June 2012 – June 2015**

Weissman-Unni Lab, Department of Biology
Lewis & Clark College

- Conduct research on the development of the zebrafish hindbrain and zebrafish disease models
- Manage zebrafish colony, maintain inventory of lab supplies, repair equipment
- Act as teaching lab assistant for Prof. Weissman-Unni's neurobiology course
- Train undergraduates in zebrafish techniques and assist with theses

Summer Research Intern**May 2011 – August 2011**

Jaffe Lab, Marine Physics Laboratory
Scripps Institution of Oceanography, University of California San Diego

- Assist senior researchers (underwater instrument deployment, data collection/analysis)
- Classify zooplankton from image data and analyze abundances across oceanic transects
- Take part in week-long research cruise (net tows, instrument repair/deployment, data analysis)
- Present project results to program at end of summer

FELLOWSHIPS, GRANTS, AND AWARDS

North Pacific Research Board Core Program, <i>co-authored</i> "An evolving threat: thermal adaptation and the spread of an invasive biofouling tunicate in the Gulf of Alaska" Value = \$211,734 USD	2022-2024
Woods Hole Oceanographic Institution Grassle Fellowship Fund Value = \$7,500 USD	2022
American Philosophical Society Lewis and Clark Field Scholar Value = \$4,500 USD	2021
National Defense Science and Engineering Graduate Fellowship Est. value = \$333,950 USD	2020 – 2023
Woods Hole Oceanographic Institution Ocean Ventures Fund Value = \$6,000 USD	2019
University of Otago International Research Master's Scholarship Value = \$37,833 NZD	2016

University of Otago Department of Zoology Conference Grant Value = \$300 NZD	2016
New Zealand Society of Parasitology Student Travel Grant Value = \$500 NZD	2016
Aquanearing Art of Science Imaging Contest, 1 st Place Winner. Value = \$1,000 USD	2015
Lewis & Clark College Dean's Scholarship Value = \$12,000 USD (\$3,000 per annum)	2008 – 2012

MENTORING EXPERIENCE

Mikenna Pruette, San Diego State University, STARS Student	Summer 2025
Gareth Miller, Western Washington University, WHOI Guest Student	Summer/Fall 2023
Junke “Kelly” Lin, Falmouth Academy, State Science Fair Finalist	Fall 2022
James Heiser, University of Tampa, WHOI Summer Student Fellow	Summer 2022

TEACHING EXPERIENCE

Lecturer II, Genomes and Evolution Lab, University of San Diego	Spring 2026
Lecturer, Organismic and Evolutionary Biology, UC San Diego	Summer 2025
Lecturer II, Genomes and Evolution Lab, University of San Diego	Spring 2025
Teaching Assistant, Biological Oceanography, MIT-WHOI Joint Program	Spring 2020
Demonstrator, Behavioural and Evolutionary Ecology, University of Otago	Fall 2016
Demonstrator, Freshwater Ecology, University of Otago	Spring 2016
Exam Reader/Writer, Disability Information and Support, U. of Otago	Fall/Spring 2016
Acting Teaching Lab Assistant, Neurobiology, Lewis & Clark College	Spring 2013 – 2015

OUTREACH, CONSERVATION, AND SERVICE

Science Fair Mentor Falmouth Academy	September 2022 – February 2023
Treasurer and Biological Oceanography Representative MIT-WHOI Joint Program Student Organization	October 2020 – September 2021
Trails Technician Larimer County Department of Natural Resources, CO	March – June 2018
Conservation Easement Monitor and Outreach Specialist Larimer County Department of Natural Resources, CO	April – October 2017

POSTERS AND PRESENTATIONS

ZJC Tobias and DJ Rennison. Exploring parallelism of gene expression across ecotypes of the threespine stickleback (*Gasterosteus aculeatus*) Western Society of Naturalists. November 9th, 2025. Oral presentation.

ZJC Tobias. Exploring the molecular basis of parallel evolution in tunicates and stickleback. UCSD Ecology, Behavior, and Evolution Seminar. November 22nd, 2024. Oral presentation.

ZJC Tobias, G Miller, CK Tepolt. Plasticity and adaptation shape geographic variation of thermal tolerance in the invasive golden star tunicate, *Botryllus schlosseri*. Western Society of Naturalists. November 8th, 2024. Oral presentation.

ZJC Tobias and CK Tepolt. Population genomics of an invasive tunicate reveals limited parallelism during local adaptation to temperature across both coasts of North America. The Evolution Meeting. June 28th, 2024. Oral presentation.

ZJC Tobias, G Miller, CK Tepolt. Differentiation of thermal tolerance in the invasive golden star tunicate, *Botryllus schlosseri*. Alaska Marine Science Symposium. January 29th, 2024. Poster presentation.

ZJC Tobias. Geography and developmental plasticity shape post-larval thermal tolerance in the golden star tunicate, *Botryllus schlosseri*. WHOI BioSeminar. August 17th, 2023. Oral presentation.

ZJC Tobias and CK Tepolt. Whole-genome data reveal extremely fine-scale population structure in *Botryllus schlosseri*. International Conference on Marine Bioinvasions XI. May 19th, 2023. Oral presentation. (*Presented by CKT, as I was on paternity leave*).

CK Tepolt and **ZJC Tobias**. Understanding marine invasive species with genomics and ecophysiology. Alaska Invasive Species Partnership. October 11th, 2022. Oral presentation.

ZJC Tobias. Low-coverage whole genome sequencing reveals multiple introductions of a highly invasive tunicate to the west coast. NDSEG Conference. July 28th, 2022. Oral presentation.

ZJC Tobias. How to make a zombie: coordinated changes in gene expression in response to a body-snatching parasite. WHOI Student BioSeminars. February 27th, 2020. Oral presentation.

ZJC Tobias, GM Ruiz, and CK Tepolt. Assessing the transcriptional response to an invasive body-snatching parasite in the mud crab *Rhithropanopeus harrisi*. The Evolution Meeting, June 22nd, 2019. Poster presentation.

ZJC Tobias and R Poulin. Evolutionary genetics of New Zealand hairworms (Nematomorpha), *Thaumamermis zealandica* (Mermithidae), and their hosts. University of Otago Zoology Postgraduate Symposium, November 11th, 2016. Oral presentation.

ZJC Tobias and R Poulin. Comparative population genetics in two host-parasite systems of New Zealand's South Island. New Zealand Society of Parasitology Annual Meeting, October 27th, 2016. Oral presentation.

ZJC Tobias, YA Pan, and TA Weissman. Multicolor lineage tracing of neuronal progenitors in the larval zebrafish hindbrain. Society for Neuroscience Oregon Chapter Meeting, April 5th, 2014. Poster presentation.

PUBLICATIONS (* signifies equal contribution)

ZJC Tobias and CK Tepolt. (in prep). Population genomics reveals invasion dynamics of the golden star tunicate (*Botryllus schlosseri*) in North America.

ZJC Tobias and CK Tepolt. (in prep). Limited genomic parallelism during local adaptation to temperature in an invasive tunicate.

ZJC Tobias, G Miller, CK Tepolt. (2025). Variation of thermal tolerance during northward range expansion in the invasive golden star tunicate, *Botryllus schlosseri*. Conservation Physiology. **13**, coaf018. [link](#)

ZJC Tobias, AR Solow, CK Tepolt. (2024). Geography and developmental plasticity shape post-larval thermal tolerance in the golden star tunicate, *Botryllus schlosseri*. *Journal of Thermal Biology*. **119**, 103763. [link](#)

ZJC Tobias, AE Fowler, AMH Blakeslee, JA Darling, ME Torchin, AW Miller, GM Ruiz, CK Tepolt. (2021). Invasion history shapes host transcriptomic response to a body-snatching parasite. *Molecular Ecology*. **30**, 4321–4337. [link](#)

L Weston, Z Cook, T Stackhouse, M Sal, B Schultz, **ZJC Tobias**, VR Osterberg, N Brockway, S Pizano, G Glover, VK Unni, and TA Weissman. (2021). In vivo aggregation of presynaptic alpha-synuclein is not influenced by its phosphorylation at serine-129. **152**, 105291. *Neurobiology of Disease*. [link](#)

MB Parsley, ML Torres, S Banerjee, **ZJC Tobias**, CS Goldberg, MA Murphy, and MC Mims. (2020). Multiple lines of genetic inquiry reveal effects of local and landscape factors on an amphibian metapopulation. *Landscape Ecology*. **35**, 319–335. [link](#)

NL Brockway*, ZT Cook*, M O’Gallagher*, **ZJC Tobias***, M Gedi, KM Carey, YA Pan, MR Metz, and TA Weissman. (2019). Multicolor lineage tracing using *in vivo* time-lapse imaging reveals coordinated death of clonally related cells in the developing vertebrate brain. *Developmental Biology*. **453**, 130-140. [link](#)

ZT Cook, NL Brockway, **ZJC Tobias**, J Pajarla, IS Boardman, H Ippolito, S Nkombo-Nkoula, and TA Weissman. (2019). Combining near-infrared fluorescence with Brainbow to identify specific genes within a multicolor context. *Molecular Biology of the Cell*. **30**, 491-505. [link](#)

AK Yadav, **ZJC Tobias**, and A Schmidt-Rhaesa. (2018). *Gordionus maori* (Nematomorpha, Gordiida), a new species of horsehair worm from New Zealand. *New Zealand Journal of Zoology*. **45**, 29-42. [link](#)

ZJC Tobias, AK Yadav, A Schmidt-Rhaesa, and R Poulin. (2017). Intra- and interspecific genetic diversity of New Zealand hairworms (Nematomorpha). *Parasitology*. **144**, 1026-1040. [link](#)

ZJC Tobias, F Jorge, and R Poulin. (2017). Life at the beach: comparative phylogeography of a sandhopper and its nematode parasite reveals extreme lack of parasite mtDNA variation. *Biological Journal of the Linnean Society*. **122**, 113-132. [link](#)

M Marra, **ZJC Tobias**, HR Cohen, G Glover, and TA Weissman. (2015). *In vivo* time-lapse imaging in the zebrafish lateral line: a flexible, open-ended research project for an undergraduate neurobiology lab course. *The Journal of Undergraduate Neuroscience Education*. **13**, 215-224. [link](#)

KR Hamling, **ZJC Tobias**, and TA Weissman. (2015). Mapping the development of cerebellar Purkinje cells in zebrafish. *Developmental Neurobiology*. **75**, 1174-1188. [link](#)

REVIEWER

Molecular Ecology (2x), *Ecography* (2x), *Philosophical Transactions of the Royal Society B*, *Journal of Parasitology*, *Annals of Applied Biology*, *Biological Invasions* (2x), *Zootaxa*, Graduate Women in Science Fellowship, *Diversity and Distributions*, *Journal of Helminthology*, *Biological Bulletin*

REFERENCES

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