Dr. William R. Thomas

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Education and Honors

STONY BROOK UNIVERSITY — STONY BROOK, NY
Ph.D. in Ecology and Evolution — **August 2018-October 2023**

- Adviser: Dr. Liliana Dávalos
- Committee: Dr. Krishna Veeramah, Dr. Dina Dechmann, Dr. Josh Rest

UNIVERSITY AT ALBANY — ALBANY, NY
Bachelor of Science in Biology, Minor in Neuroscience — **August 2011-May 2015**

- Magna Cum Laude
- Presidential Scholarship Recipient
- Dean's List

Research Experience

Stony Brook University — Stony Brook, NY
Postdoctoral Research Associate — **October 2023-Present**

- Researching genetic population structure between phenotypically divergent populations of *Sorex araneus* by correlating population demography, environmental variation, and genetic structuring.

Stony Brook University — Stony Brook, NY
Research Assistant — **July 2019- October 2023**

- Performing and analyzing RNA-sequencing of a unique wintering strategy in *Sorex araneus* to observe temporal differential gene expression in several tissues involved in metabolic performance.
- Testing coding regions in Sorex araneus genome for metabolic genes under positive selection and comparing to genes associated with alternative wintering strategies.
- Identifying selective processes acting on mammalian brain expression using comparative transcriptomics.

Marine Biological Laboratories — Woods Hole, MA
Research Assistant — **September 2015- July 2018**

- Aid in the development of *Xenopus* as a model organism for disease modeling through project that creates mutants for the community in association with the National *Xenopus* Resource, specifically using the CRISPR-Cas system.
- Research project investigating the dynamic regulatory network driving pancreas beta cell specification. Specifically, overexpression of the downstream transcription factors of Neurogenin 3 to reprogram cells and promote ectopic beta cell fates.
- Assist in collaboration researching sex-related genes DM-W and DMRT1 in *Xenopus* with Dr. Evans using genetic knock-outs.

Grants and Awards

March 2022 American Genetics Association EECG Research Award **($4065)**
January 2022 Society for the Study of Evolution GREG Rosemary Grant Advanced Award **($3198)**
May 2021 Society of Systematic Biologists Graduate Student Research Award **($3000)**
June 2020 Sigma Xi Grants in Aid of Research Award **($978)**
May 2020 American Society of Mammalogists Grants-In-Aid of Research Award **($1500)**
March 2020 Stony Brook University George Williams Research Award **($500)**
March 2020 Stony Brook University Student Excellence Award **($450)**
March 2019 Stony Brook University Student Excellence Award **($500)**

Publications

First Author

W. R. Thomas†, D. K. N. Dechmann, J. Nieland, C. Baldoni, D. Carlson, D. von Elverfeldt, J. Holm-Jacobsen, M. Muturi, A. Corthals, L. M. Dávalos. Molecular mechanisms of seasonal brain shrinkage and regrowth in Sorex araneus. *bioRxiv* preprint.

C. Baldoni†, **W. R. Thomas**†, D. von Elverfeldt, M. Reisert, J. Làzaro, M. Muturi, L. M. Dávalos, J. D. Nieland, D. K. N. Dechmann, Histological and MRI brain atlas of the common shrew, Sorex araneus, with brain region-specific gene expression profiles. *Front. Neuroanat.* 17, 1–9 (2023).

Coauthor

M. A. Bedoya Duque†, **W. R. Thomas**, D. K. N. Dechmann, J. Nieland, C. Baldoni, D. von Elverfeldt, M. Muturi, A. Corthals, L. M. Dávalos. Large captivity effect based on gene expression comparisons between captive and wild shrew brains. *bioRxiv* preprint (in revision *Physiological Genomics*).

T. R. Lewis†, S. Phan, C. M. Castillo, K. Kim, K. Coppenrath, **W. R. Thomas**, Y. Hao, N. P. Skiba, M. E. Horb, M. H. Ellisman, V. Y. Arshavsky, Photoreceptor disc incisures form as an adaptive mechanism ensuring the completion of disc enclosure. *Elife*. 12, 1–20 (2023).

J. D. Steimle†, S. A. Rankin, C. E. Slagle, J. Bekeny, A. B. Rydeen, S. S. K. Chan, J. Kweon, X. H. Yang, K. Ikegami, R. D. Nadadur, M. Rowton, A. D. Hoffmann, S. Lazarevic, **W. R. Thomas**, E. A. T. Boyle Anderson, M. E. Horb, L. Luna-Zurita, R. K. Ho, M. Kyba, B. Jensen, A. M. Zorn, F. L. Conlon, I. P. Moskowitz, Evolutionarily conserved Tbx5-Wnt2/2b pathway orchestrates cardiopulmonary development. *Proc. Natl. Acad. Sci. U. S. A.* 115, E10615–E10624 (2018).

Presentations

Thomas, W., Dechmann, D., Nieland, J., Baldoni, C., Corthals, A., Elverfeldt, D., Muturi, M., Holm-Jacobsen, JN., Dávalos, L. Comparative transcriptomics reveal life history tradeoffs associated with the evolution of a seasonal size plasticity in shrews. Presentation 2023 Evolution, Albuquerque.

Thomas, W., Dechmann, D., Nieland, J., Baldoni, C., Corthals, A., Elverfeldt, D., Muturi, M., Holm-Jacobsen, JN., Dávalos, L. The pivotal role of the spleen in metabolic fluctuations underlying reversible size changes. Poster Presentation 2022 Human Frontiers in Science Program Awardees Meeting, France.

Thomas, W., Dechmann, D., Nieland, J., Baldoni, C., Corthals, A., Elverfeldt, D., Muturi, M., Holm-Jacobsen, JN., Dávalos, L. Shrinking Shrews: evolution of a unique wintering strategy. Presentation at 2022 Evolution, Cleveland.

Thomas, **W**. Shrinking Shrew Brains: evolution of a unique wintering strategy. Presentation at 2022 Ecology and Evolution Departmental Retreat, Stony Brook.

Thomas, **W**. Using evolutionary models to understand the genetic mechanisms of a unique wintering strategy. Presentation at 2021 Institute of Advance Computation Science Student Seminar Series, Stony Brook.

Thomas, W., Nieland, J., Baldoni, C., Corthals, A., Muturi, M., Oklinski, M., Elverfeldt, D., Dechmann. D., & Dávalos, L. Evolution of gene function, regulation and expression in a unique wintering strategy. Poster Presentation 2021 Human Frontiers in Science Program Awardees Meeting, Online.

Thomas, **W.,** Shaidana, N., Collins, C., Peshkin, L., & Horb, M. Developing *Xenopus* models of human disease. Poster Presentation at 2017 Latin American Society of Developmental Biology Meeting, Medellin.

Thomas, W., McNamara, S., Shaidani, N., Winzla, M., & Horb, M. National *Xenopus* Resource. Poster Presentation at 2017 Latin American SDB Meeting, Medellin.

Workshops and Courses

University of Washington Summer in Statistical Genetics — Online
Student — **July 2020**

- Completion of 4 modules in gene expression profiling, pathway and network analysis of "-omics" data, multivariate analysis of genetic data, and statistical genetics

OTS, Tropical Biology: An Ecological Approach — Costa Rica
Student — **June 2019**

- Gained extensive experience designing and conducting research in tropical ecosystems with emphasize on research design, statistical analyses, analytical tools, scientific communication and public outreach.

Xenopus Bioinformatics Workshops — Woods Hole, MA
Student — **May 2018**

- Computational analysis and visualization of RNA-seq and ChIP-seq data for gene enrichment experiments in both R and MATLAB

Advanced Imaging Workshop in *Xenopus* — Woods Hole, MA
Student — **October 2015**

- Techniques in fluorescent microscopy for screening, time-lapsed imaging and video processing developed
- Practiced proper techniques when using a confocal microscope needed for attaining high resolution images
- Proficient image processing skills and image representation ethics in various software forma

Teaching and Mentorship

Teaching Assistant

- Comparative Anatomy of the Chordates (Spring 2019)
- Fundamentals of Biology, Organisms to Ecosystems (Fall 2018)
- Advanced Imaging Workshop in *Xenopus* (Fall 2016)

Student Mentoring

- Maria Alejandra Bedoya, Universidad Icesi Undergraduate (Summer 2022-present)
- Clara Tucker, Stony Brook University Undergraduate 2020 (Received M.Sc at Stony Brook University 2022)
- Anthony Rodriguez-Vargas, MBL REU Summer 2016 (now PhD student at UC Berkeley)
- Katie Fisher, MBL REU Summer 2016 (now PhD student at University of Oregon)

Leadership and Outreach Experience

- Ecology and Evolution – Departmental Service Award (Spring 2023)
- Ecology and Evolution – Preliminary Exam Committee (January 2022 – April 2022)
- Ecology and Evolution – First Year Student Mentor (August 2021 – June 2022)
- Stony Brook University – College of Arts and Sciences Curriculum Committee (October 2020-August 2022)
- Stony Brook University – College of Arts and Sciences Senate Executive Council (October 2020-May 2022)
- Stony Brook University - Graduate Student Organization Senator (August 2019-present)
- Stony Brook University – GSO Emergency COVID Relief Committee (September 2020-May 2021)
- Ecology and Evolution - COVID-19 Grad Affairs Committee (July 2020 – March 2021)
- Ecology and Evolution – Program Retreat Committee (September 2019-March 2021)
- Cape Cod School Districts – Regional Science Fair Judge (March 2017-April 2018)

Wet Lab and Computer Programming Skills

- CRISPR-Cas genome editing, animal husbandry, DNA/RNA extractions, gel electrophoresis, PCR, RNA-seq, single cell sequencing, Sanger sequencing, genome annotations
- R, Python, bash