Samantha Standring

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Research Interests

Insect genetics, evolution of silk proteins, silk gland cell structure, gene expression in polyploid cells, evolution of assassin bug venom, salivary gland gene expression

Education

June 2023 — PhD, Entomology
University of California, Riverside
Advisor: Dr. Christiane Weirauch
Dissertation: Systematics and Evolution of True Bugs (Heteroptera) and Thread-Legged Assassin Bugs (Emesinae: Reduviidae)

August 2017 — B.Sc., Biology
Brigham Young University
Major Professor: Dr. Seth Bybee
3.93 GPA, *Magna Cum Laude*

Professional Experience

2024-current — **Assistant Professor,** Brigham Young University
2023-2024 — **Postdoctoral Fellow,** Brigham Young University
2017–2023 — **Research Assistant,** University of California, Riverside
2015–2017 — **Undergraduate Lab Assistant,** Brigham Young University
2012–2014 — **Undergraduate Lab Assistant**, Brigham Young University

Peer-reviewed Publications

9. **Standring, S.,** Heckenhauer, J., Stewart, R.J., Frandsen, P. (2025). Unraveling the genetics of underwater caddisfly silk. *Trends in Genetics.* https://doi.org/10.1016/j.tig.2025.01.004
8. Jijon, G., Errigo, I., Ríos, B., Wicks, J., Nyborg, N., Buck, L., Davis, D., **Standring, S.,** Frandsen, P. (2025). Comparing DNA and morphological bioassessment methodologies for macroinvertebrates in Neotropical streams: a case study from Ecuador. *Metabarcoding and Metagenomics.*
7. Jarvis, D., Stevens, M., Carter, P., Fei Lin, Y., Jaggi, E., Jijon, G., Kalt, T., Calixto, J., **Standring, S**., Torres, K., Stephensen, K., Mangelson, H., Williams, N., Wessinger, C., Maughan, P., Frandsen, P. (2024). Whole-genome assembly and annotation of the firecracker penstemon (*Penstemon eatonii*). *Journal of Heredity.* https://doi.org/10.1093/jhered/esae058
6. Masonick, P., Knyshov, A., Gordon, E., Forero, D. Hwang, W. S., Hoey-Chamberlain, R., Bush, T., Castillo, S., Hernandez, M., Ramirez, J., **Standring, S.**, Zhang, J., Weirauch, C. (2024). A revised classification of the assassin bugs (Hemiptera: Heteroptera: Reduviidae) based on combined analysis of phylogenomic and morphological data. *Systematic Entomology*, https://doi.org/10.1111/syen.12646
5. **Standring, S**., Forero, D., & Weirauch, C. (2024). Untangling the web: Phylogeny and classification of the spider-associated Emesine complex (Hemiptera: Reduviidae), *Systematic Entomology*, https://doi.org/10.1111/syen.12603
4. Knyshov, A., Gordon, E. R., Masonick, P., Castillo, S., Forero, D., Hoey-Chamberlain, R., Hwang, W. S., Johnson, K., Lemmon, A., Lemmon, E., **Standring, S**., Zhang, J., Weirauch, C. (2023). Chromosome-Aware Phylogenomics of Assassin Bugs (Hemiptera: Reduvioidea) Elucidates Ancient Gene Conflict, *Molecular Biology and Evolution,* https://doi.org/10.1093/molbev/msad168
3. **Standring, S**., M. Sanchez, R. Guillermo-Ferreira, J. Ware, Y. Vega-Sánchez, R. Clement, J.P. Drury, G. Grether, A. González-Rodríguez, L. Mendoza-Cuenca, C. Bota-Sierra, S.M. Bybee (2022). Evolution and biogeographic history of rubyspot damselflies (Hetaerininae: Calopterygidae: Odonata), *Diversity*

2. Clement, R.A., Saxton, N., **Standring, S.**, Arnold, P., Johnson, K., Bybee, D., Bybee, S. (2021). Phylogeny, migration and geographic range size evolution of *Anax* dragonflies (Anisoptera: Aeshnidae). *Zoological Journal of the Linnean Society,* https://doi.org/10.1093/zoolinnean/zlab046

1. **Smith*, S.**, Hwang, W. S., & Weirauch, C. (2019). Synonymy of *Mangabea* and *Stenorhamphus*, with the description of two new species (Hemiptera: Reduviidae: Emesinae: Collartidini). *Raffles Bulletin of Zoology*, https://doi.org/10.26107/RBZ-2019-0011

Science communication publications

Smith*, S., C.R. Nelson. (2016). Assessment of biodiversity on Mount Timpanogos with a focus on flies, Diptera: Agromyzidae. BYU Journal of Undergraduate Research.

Smith*, S. S.M. Bybee. (2018). Phylogeny of *Hetaerina* (Odonata: Calopterygidae). BYU Journal of Undergraduate Research.

Smith*, S. (2019). Assassins in the jungles of Gabon. Entomology Graduate Student Association at University of California, Riverside. Blog post.

Smith*, S. (2020). Barro Colorado collecting trip. Friends of the Entomology Research Museum. Newsletter.

*Last name changed from Smith to Standring in 2020

Fellowships

2019–2023	Graduate Research Fellowship Program (GRFP)	**$138,000**
2017–2019	Provost Research Fellowship, UC Riverside	**$50,000**
2017–2020	NICE NRT Fellow, National Science Foundation	**$153,570**

Grants and awards

2024	Interdisciplinary Research Award, PI (Samantha Standring, John Sproul, Scott Weber) *Evolution of Polyploid cells in Caddisfly Silk Glands*	**$30,000**
2024	International Congress of Entomology, Women in Science talk competition	
2023	Dr. Mir S. Mulla & Leila Mulla Endowed Scholarship Fund	**$11,800**
2022	International Heteropterists' Society: Student talk competition	**2nd Place**
2022	Dr. Mir S. Mulla & Leila Mulla Endowed Scholarship Fund	**$10,700**
2022	ESA SysEB: Phylogenetics and Phylogenomics student talk competition	**2nd Place**
2020	UCR Inclusive Excellence Travel Fund	**$500**
2019	NatGeo Research grant *Predators become prey: untangling spider-associated behavior and morphology within true bugs (Heteroptera)*	**$27, 505**
2019	CNAS Dr. Janet M. Boyce Memorial Endowed Fund	**$2,000**
2018	SysEB travel grant *Life in the web: tracing the evolution of spider associated thread-legged assassin bugs*	**$1,025**
2017	Robert M. Squires Evolution Fellowship 2017	**$2,200**
2016	ORCA grant– *Phylogeny of Hetaerina (Odonata: Calopterygidae)*	**$1,500**
2015	ORCA grant– *Assessment of biodiversity on Mount Timpanogos with a focus on flies, Diptera: Agromyzida*e	**$1,500**

Invited talks

Oral Presentation, "Allelic diversity of the silk protein *H-fibroin* across Lepidoptera", International Congress of Entomology, Kyoto 2024

Oral Presentation, "Unraveling the Web: Systematics and Evolution of Thread-Legged Assassin Bugs (Emesinae: Reduviidae)", BYU Undergraduate Alumni Symposium, 2023

Oral Presentation, "Combining transcriptomes and genomes to resolve relationships within Heteroptera", True Bug Tuesday Series, 2022

Oral Presentation, "Phylogenomics of True Bugs (Heteroptera)", International Congress of Entomology, Helsinki 2022

Oral Presentation, "Phylogenomics of True Bugs (Heteroptera)", Pacific Branch of ESA, Spokane WA 2020 – cancelled due to Covid-19

Oral Presentation, "Evolution of spiderweb association in thread-legged assassin bugs", ENTM 250 Series Webinar, UC Riverside 2020

Oral Presentation, "Dragons of the Jungle", Friends of the Entomology Research Museum (FERM), UC Riverside, 2018

Presentations

Oral Presentation, "Using HiFi sequencing to recover allelic diversity of silk proteins across Lepidoptera", Entomological Society of America, Phoenix 2024

Oral Presentation, "Phylogenomics of True Bugs (Heteroptera)", Entomological Society of America, Vancouver 2022

Oral Presentation, "Evolutionary history and biogeography of thread-legged assassin bugs (Reduviidae: Emesinae)", International Heteropterists' Society, Barcelona 2022

Oral Presentation, "Evolutionary history and biogeography of thread-legged assassin bugs (Reduviidae: Emesinae)", Entomological Society of America, Denver 2021

Oral Presentation, "Untangling the correlation of unique foreleg morphology and spiderweb association in thread-legged assassin bugs (Emesinae: Reduviidae)", Evolution, Providence Rhode Island 2019

Oral Presentation, "Life in the web: tracing the evolution of spider associated thread-legged assassin bugs (Emesinae: Reduviidae)", Entomological Society of America, Vancouver Canada 2018

Oral Presentation, "Unraveling the evolution of thread-legged assassin bugs (Emesinae: Reduviidae) and their spider-associated morphology", Student Seminar Day, UC Riverside 2018

Oral Presentation, "Solving the rubyspot mystery, a phylogeny of *Hetaerina* and *Mnesarete* (Odonata: Calopterygidae)", Entomological Society of America, Denver Colorado 2017

Oral Presentation, "Interspecific Competition in Hetaerina Damselflies", II BecInt, II Behavioral Ecology and Conservation Symposium at Uberlandia, Brazil 2017

Oral Presentation, "Phylogeny of Hetaerina, Rubyspotted Damselflies", Dragonfly Association of the Americas 2016

Poster, "Evolution of thread-legged assassin bugs", Student Seminar Day, UC Riverside September 2021

Poster, "Life in the web: tracing the evolution of spider associated thread-legged assassin bugs (Emesinae: Reduviidae)", Student Seminar Day, UC Riverside September 2019

Poster, Martin, G., C. Bills, R.A. Clement, **S. Smith*,** S.M. Bybee. "Using citizen science to illuminate firefly (Coleoptera: Lampyridae) localities in Utah", Entomology Society of America, Denver, CO 2017

Poster, "Phylogeny of Rubyspot Damselflies (Calopterygidae: *Hetaerina*)", Brigham Young University 2017

Professional Service

Reviewer for Systematic Entomology, Annales de la Société Entomologique de France, Proceedings of the Entomological Society of Washington, Zootaxa, Biological Journal of the Linnean Society, Austral Entomology, Biological Journal of the Linnean Society, Journal of Systematics and Evolution, Cladistics, Biology

Fall 2024	PWS Conclave judge CURA review panel
Winter 2025	Roger and Victoria Sant Endowment for a Sustainable Environment review panel

Outreach/Volunteer Work

Spring 2023	**Riverside insect fair chair**
Winter 2022	**Skype a Scientist**
Spring 2021	**Riverside virtual insect fair participant**
Fall 2020	**GRFP workshop and mock panel**
Summer 2019	**Thread-legged assassin bug spider associations in Cameroon**
Summer 2019	**Little Entomologist Summer Camp Volunteer**

Summer 2019	**Summer camp science volunteer**
Summer 2018	**Little Entomologist Summer Camp Volunteer**
Spring 2018	**Riverside insect fair participant**

Teaching Experience

Winter 2025	**PWS 340: Genetics** Mendelian genetics, extensions and modifications of basic principles
Summer 2024	**SPIN Workshop Instructor** Genome annotation pipeline Transposable Element annotation pipeline
Summer 2022	**Short Course Instructor** Biodiversity of True Bugs (Hemiptera: Heteroptera)
Winter 2022	**Teaching assistant** ENTM202: Insect Biodiversity and Evolution
Winter 2021	**Teaching assistant** ENTM050: The Evidence for Evolution UC Riverside Developed and graded worksheets and final essay Presented guest lecture on systematics
Fall 2015	**Teaching assistant** Bio230: Plant Diversity Brigham Young University Taught lab once a week Graded quizzes and lab reports
Winter 2015	**Teaching assistant** Bio220A: Animal Diversity Brigham Young University Graded reports; held reviews
Fall 2014	**Teaching assistant** Bio100: Intro to Biology Graded research papers Tutored students Led labs and presented mini lectures

International fieldwork

Fall 2019	**Panama** Barro Colorado Island Research Station
Summer 2019	**Cameroon** Bouamir research station
Winter 2019	**Gabon** Lope national park, Ivindo national park, Crystal mountain
Summer 2017	**Cameroon** Bouamir research station
Summer 2017	**Brazil** Manaus, Belem, São Paulo
Spring 2016	**Brazil** Ubatuba

Mentorship

Thomas Harper, undergraduate, Brigham Young University 2026-present: evolution of polyploid cells in caddisflies
Isaac Britt, undergraduate, Brigham Young University 2026-present: evolution of polyploid cells in caddisflies
Melanie Mowers, undergraduate, Brigham Young University 2026-present: evolution of polyploid cells in caddisflies
Julia Fordham, undergraduate, Brigham Young University 2025-present: analyzing Emesinae gut metabarcoding sequences
Joshua Metge, undergraduate, Brigham Young University 2025-present: evolution of polyploid cells in caddisflies
Janey Cress, undergraduate, Brigham Young University 2024-present: caddisfly rearing and transcriptomics
Lillian Davis, undergraduate, Brigham Young University 2024: silk gene expression in Embioptera silk glands, funded CURA
Heidi Snyder, undergraduate, Brigham Young University 2024: distribution of different morphs of the Mormon Fritillary across the Wasatch Front, funded CURA
Gabriela Jijon, PhD student, Brigham Young University 2024: manuscript preparation
Danyon Gedris, undergraduate, Brigham Young University 2024: silk gene extraction across Lepidoptera
Esra Suleiman, undergraduate, UC Riverside 2021: Science communication
Ryan Culhane, undergraduate, UC Riverside 2020-2021: Evolution of Harpactorinae egg diversity
Michael Anyakora, undergraduate, UC Riverside, 2018: Methods in systematics
Alan Myrup, High School Teacher, Mountain View High School, UT, 2016: DNA extraction and PCR
Nathan Geary, High School Student, Mountain View High School, UT, 2016: DNA extraction and PCR

Workshops attended

December 2019 **Reduviidae Workshop**
UC Riverside
Seven-day workshop
Studied Reduviidae morphology

May 2019 **Applied Phylogenetics Workshop**
Bodega Bay, California
Eight-day workshop
Trained in Bayesian phylogenetics theory and methods

October 2018 **aTRAM2 Workshop**
Champaign, Illinois
Quality trimming raw read files
Library construction and locus assembly
Post processing

July 2018 **Molecular Evolution Workshop**
Marine Biological Laboratory, Woods Hole, Massachusetts
Ten-day workshop
Trained in latest systematics software, principles of molecular evolution

*Last name changed from Smith to Standring in 2020
Publications, presentations, mentoring, grants and teaching since starting position as Assistant Professor at BYU highlighted in blue