
Stephanie S.L. Birnbaum
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Professional Appointments

Visiting Assistant Professor Occidental College, Biology Department	2022 – present
Postdoctoral Fellow Vanderbilt University, Biological Sciences Department, PI: Dr. Ann Tate	2019 – 2022

Education

Vanderbilt University Ph.D., Biological Sciences Department, PI: Dr. Patrick Abbot	2014 – 2019
Emory University B.S. Biology, Highest Honors in Biology	2008 – 2010
Oxford College of Emory University A.A. Arts and Sciences	2006 – 2008

Teaching Experience

Visiting Assistant Professor, Occidental College	2022 – present
- Introductory Biology: Biodiversity, Ecology, & Evolution (Bio 110)	
- General Zoology (Bio 115)	
- Evolutionary Biology (Bio 280)	
- Microbial Symbiosis Lab (Bio 350L)	
- Senior Seminar (Bio 490)	
- First Year Seminar: Science, Society, and You (FYS 75)	
Co-instructor, Summer Academy at Vanderbilt for the Young (SAVY)	2018
- ‘Land, Air, and Sea: Field Ecology and the Natural World’	

Fellowships, Grants, and Scholarships

NIFA Postdoctoral Fellowship U.S. Department of Agriculture, Award No. 2019-67012-29659	2019 – 2021
Graduate Research Fellowship National Science Foundation	2014 – 2019
SIRE Fellowship Scholarly Inquiry and Research at Emory University	2009 – 2010
Dean’s Scholar Scholarship Emory University	2006 – 2010

Peer-Reviewed Publications

Schulz NKE, Asgari D, Liu S, **Birnbaum SSL**, Williams AM, Prakash A, Tate AT. 2025. Resources Modulate Developmental Shifts but Not Infection Tolerance Upon Co-Infection in an Insect System. *Molecular Ecology*, 20:e17726.

Birnbaum, S.S.L. and Abbot, P. 2020. Gene expression and diet breadth in plant-feeding insects: summarizing trends. *Trends in Ecology and Evolution*, 35(3): 259-277.

Birnbaum, S.S.L., Rinker D.C., and P. Abbot. 2018. Efficient Methods for Maintaining Biological Cultures and Measuring Gene Expression in *Aphis nerii*: A Non-Model System for Plant-Insect Interactions. *Journal of Visualized Experiments*, (138), e58044.

Birnbaum, S.S.L. and Abbot, P. 2018. Insect adaptations towards plant toxins in milkweed-herbivores systems. *Entomologia Experimentalis et Applicata*, <https://doi.org/10.1111/eea.12659>.

Birnbaum, S.S.L., Rinker D.C., Gerardo N.M., and P. Abbot. 2017. Transcriptional profile and differential fitness across a toxicity gradient in a specialist milkweed insect. *Molecular Ecology*, 26(23): 6742-6761.

Birnbaum, S.S.L. and Gerardo, N. 2016. Patterns of specificity of the pathogen *Escovopsis* across the fungus-growing ant symbiosis. *The American Naturalist*, 188(1): 52-65.

de Man, T.J.B., Stajich J.E., Kubicek C.P., Teiling C., Chenthamara K., Atanasova L., Druzhinina I.S., Levenkova N., **Birnbaum S.S.L.**, Barrièreau S.M., Bozick B.A., Suen G., Currie C.R., and N.M. Gerardo. 2016. Small genome of the fungus *Escovopsis weberi*, a specialized disease agent of ant agriculture. *PNAS* 113(13): 3567-3572.

Searle, C.L., Housley Ochs, J., Caceres, C.E., **Chiang, S.S.L.**, Gerardo, N.M., Hall, S.R., and M.A. Duffy. 2015. Plasticity, not genetic variation, drives infection success of a fungal parasite. *Parasitology* 142: 839-848.

Garcia, J., Laughton, A., Malik, Z., Parker, B., Trincot, C., **Chiang, S.S.L.**, Chung, E., and N.M. Gerardo. 2014. Partner associations across sympatric broad-headed bug species and their environmentally acquired bacterial symbionts. *Molecular Ecology* 23: 1333-1347.

Pre-print Manuscripts

Birnbaum, S.S.L., Schulz N.K.E, A.T. Tate. 2023. Interactions between evolved pesticide resistance and pesticide exposure influence immunity against pathogens. *In revision*, bioRxiv, <https://doi.org/10.1101/2022.02.04.479151>.

Birnbaum, S.S.L., Schulz N.K.E., Garrett D.S., A.T. Tate. 2021. Experimental evolution of insect resistance to two pesticide classes reveals mechanistic diversity and context-dependent fitness costs. *In revision*, bioRxiv, <https://doi.org/10.1101/2021.09.03.458899>.

Birnbaum, S.S.L. and Abbot, P. 2020. Trans-generational transcriptomic response to natural variation in host plant toxicity and insecticides in a specialist insect. *In revision*, bioRxiv, <https://doi.org/10.1101/541904>.

Students Mentored and Departmental Service Positions

- Occidental College, 2023-present
 - Zoe Bush, Milan Coleman, Andrew Levy, Marielle Mandeville, Emma McLaughlin, Olivia Plumb, Richter Faculty-led Research in Costa Rica, Summer 2025
 - Emma McLaughlin, Multi-site Research Project (RESCUE-Net), Spring 2024
 - Mari Pokorny, Summer Research Program 2023
- Occidental College, 2023-present
 - Biology Club Faculty Advisor

Honors and Awards

Oral Presentation Award	2019
International Society of Chemical Ecology	
Ann Bernard Martin Award for Excellence in Graduate Research	2017
Vanderbilt Biological Sciences Department	
Best Poster Award	2015
Vanderbilt Biological Sciences Department	
Outstanding Candidate Award	2014
Vanderbilt Biological Sciences Program	
Highest Honors in Biology	2010
Emory University	
Honorable Mention Award	2010
SIRE Poster Session, Emory University	
Dean's List	2007 – 2010
Emory University	

Selected Presentations

Birnbaum, S.S.L. Evolution under chemical warfare: Lessons learned from insect systems. *Biology Seminars*: Occidental College, Los Angeles, CA. February 7, 2023.

Birnbaum, S.S.L. and A.T. Tate. Evolution under chemical warfare: Variation in combat strategies. *Evolution at Vanderbilt Seminar Series*: Vanderbilt University, Nashville, TN. March 3, 2021. <https://www.youtube.com/watch?v=yFoTQH2jHao>

Birnbaum, S.S.L. and P. Abbot. Aphid transcriptional profiles converge after exposure to toxic host plants and insecticides. *International Society of Chemical Ecology Conference*: Atlanta, GA. June 6, 2019.

Birnbaum, S.S.L. and P. Abbot. Trans-generational transcriptomic response to natural variation in host plant toxicity and insecticides in a specialist insect. *Gordon Research Conference: Plant-Herbivore Interactions*: Ventura, CA. March 25, 2019. (Poster)

Selected Presentations

Birnbaum, S.S.L. and P. Abbot. Trans-generational transcriptomic response to increased toxicity host plants and xenobiotic chemicals. *Evolution Conference*: Montpellier, France. August 19, 2019. (Poster)

Birnbaum, S.S.L. Effects of increased host plant toxicity in a specialist milkweed insect. *Department of Biological Sciences Seminar Series*: Vanderbilt University, Nashville, TN. October 9, 2017.

Birnbaum, S.S.L. Effects of increased host plant toxicity in a specialist milkweed insect. *Ecology and Evolution of Species Interactions at Emory Seminar Series*: Emory University, Atlanta, GA. September 15, 2017. (Invited Seminar)

Birnbaum, S.S.L., Rinker D.C., Gerardo N.M., and P. Abbot. Transcriptional profile and differential fitness across a toxicity gradient in a specialist milkweed insect. *Ecological Society of America Conference*: Portland, OR. August 11, 2017. (Poster)

Chiang, Stephanie S.L. and Gerardo, N.M. Non-immunological defenses in milkweed aphids against a fungal pathogen. *Evolution*: Snowbird, Utah, USA. June 23, 2013.

Chiang, Stephanie S.L. and Gerardo, N.M. Specificity of the parasite *Escovopsis* among two sympatric species of *Cyphomyrmex* fungus-growing ants. *First Joint Congress on Evolutionary Biology*: Ottawa, Ontario, Canada. July 7, 2012.

Training Workshops

- At-Risk Mental Health for Faculty & Staff Course. Kognito. 2023.
- Online Teaching Specialization Course. Center for Teaching, Vanderbilt University, Nashville, TN. 2020
- Certificate in College Teaching. Center for Teaching, Vanderbilt University, Nashville, TN. 2018
- Workshop on Genomics. Cesky Krumlov, Czech Republic, January 8-20, 2017

Invited Peer Review

- *Molecular Ecology*
- *Functional Ecology*
- *Philosophical Transactions B*
- *Journal of Insect Physiology*
- *Plos One*
- *Journal of Economic Entomology*
- *Myrmecological Review*

Selected Service to the Community

- Monday at the Mission, Union Rescue Mission, 2023 – present
- Advisory Council, Boundless Brilliance, 2022 – 2024
- Leader of “Solving a Disease Outbreak with the BCDC”, Tennessee Women in Science, Technology, Engineering, and Research (TWISTER), JFK Middle School, Antioch, TN, November 2019
- Interview a Scientist, JC Mitchell Elementary Schools, Boca Raton, FL, November 2019
- Co-leader of “It’s a Bug’s World”, MegaMicrobes, Vanderbilt University, Nashville, TN, October 2019
- Speaker, “What we can learn from the evolution of toxic plant-insect interactions”, Nashville Science Club, Nashville, TN, July 2019
- Co-leader of “The Mycrobes Around You”, MegaMicrobes, Vanderbilt University, Nashville, TN, October 2018
- Co-leader of “The Evolutionary Tree of Life”, TWISTER, Adventure Science Center, Nashville, TN, February 2017 & 2018
- Leader of “The Mycrobes Around You”, MegaMicrobes, Vanderbilt University, Nashville, TN, October 2017
- Leader for “Animal Habitats” badge for Girl Scouts Troop # 1347, Nashville, TN, September 2017