Sarah Budischak
Postdoctoral Research Fellow
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Appointments

Writing in Science and Engineering Teaching Fellow. Princeton University. Princeton Writing Program. February 2016 - present.

Postdoctoral Research Associate. Princeton University. Department of Ecology and Evolutionary Biology. March 2015 - present.

Postdoctoral Research Associate. The University of Georgia. Odum School of Ecology. August 2014 - February 2015

Education

Ph.D. **University of Georgia.** *With Honors.* 2014.
Odum School of Ecology. *The causes and consequences of parasite co-infection: insights from community ecology.*
University of Montana. Transferred to UGA with advisor's lab in 2010.
Division of Biological Sciences, Organismal Biology and Ecology Program.

M.S. **Virginia Polytechnic Institute and State University.** 2007.
Department of Fish and Wildlife Conservation. *The reciprocal effects of trematode parasites and malathion on developing pickerel frogs (Rana palustris).*

B.S. **Davidson College**. Biology Major, Chemistry Minor. *cum laude*, 2005.

Peer-reviewed Publications

1. **Budischak, S.A.**, D. O'Neal, A.E. Jolles, and V.O. Ezenwa. Differential host responses to parasitism shape divergent fitness costs of infection. *Functional Ecology*. In Press.
2. Austin, L.V.*, **S.A. Budischak**[1], J. Ramadhin*, E.P. Hoberg, A. Abrams, A.E. Jolles, and V.O. Ezenwa. 2017. A comparison of two methods for quantifying parasitic nematode fecundity. *Parasitology Research* 116:1597-1602.
3. Henley, W., J.J. Schmerfeld, **S.A. Budischak**, C.M. Hall, R.J. Neves, S. Ciparis, and J.W. Jones. 2016. Freshwater mussel (Unionidae) abundance and diversity upstream and downstream of a superfund site on the North Fork Holston River, Saltville, Virginia. *Journal of Shellfish Research*, 35:875-883.
4. **Budischak, S.A.**, A. Abrams, E. Hoberg, A.E. Jolles, and V.O. Ezenwa. 2016. Experimental insight into the process of parasite community assembly. *Journal of Animal Ecology*, 85:1222-1233.
5. P.R. Stephens, S. Altizer, K.F. Smith, A.A. Aguirre, J.H. Brown, **S.A. Budischak**, J.E. Byers, J.T. Davies, J.M. Drake, V.O. Ezenwa, M.J. Farrell, J.L. Gittleman, B.A. Han, S. Huang, R.A. Hutchinson, P.T. Johnson, C.L. Nunn, D. Onstad, A. Park, G.M. Vazquez-Prokopec, J.P. Schmidt, and R. Poulin. 2016. The macroecology of infectious diseases: a new perspective on global-scale drivers of pathogen distributions and impacts. *Ecology Letters* 19:1159-1171.
6. **Budischak, S.A.**, Art Abrams, Eric Hoberg, A.E. Jolles, and V.O. Ezenwa. 2015. A combined parasitological molecular approach for noninvasive characterization of parasitic nematode communities in wild hosts. *Molecular Ecology Resources* 15:1112-1119.
7. **Budischak, S.A.**, K. Sakamoto, L.C. Megow*, K.R. Cummings, J.F. Urban, Jr, and V.O. Ezenwa. 2015. Resource limitation alters the consequences of co-infection for hosts and parasites. *International Journal for Parasitology* 45:455-463.
8. **Budischak, S.A.**, A.E. Jolles, and V.O. Ezenwa. 2013. Direct and indirect costs of co-infection in the wild: linking GI parasite communities, host hematology, and immune function. *International Journal for Parasitology: Parasites and Wildlife* 1:2-12.
9. Hopkins, W.A., C. Bodinof, **S.A. Budischak**, and C. Perkins. 2013. Nondestructive indices of mercury exposure in three species of turtles occupying different trophic niches downstream from a former chloralkali facility. *Ecotoxicology* 22:22-32.

10. Bergeron, C.M., K.M. Bodinof, **S.A. Budischak,** H. Wada, J.M. Unrine, and W.A. Hopkins. 2011. Counterbalancing effects of maternal mercury exposure during different stages of early ontogeny in American toads. *Science of the Total Environment* 409:4746-4752.
11. **Budischak, S.A.**, L.K. Belden, and W.A. Hopkins. 2009. Relative toxicity of malathion to trematode-infected and noninfected *Rana palustris* tadpoles. *Archives of Environmental Contamination and Toxicology* 56:123-128.
12. **Budischak, S.A.**, L.K. Belden, and W.A. Hopkins. 2008. The effects of malathion on embryonic development and latent susceptibility to trematode parasites in ranid tadpoles. *Environmental Toxicology and Chemistry* 27:2496-2500.
13. Hester, J. M., **S.A. Budischak**, and M.E. Dorcas. 2008. The Davidson College Box Turtle Mark-Recapture Program: Urban Herpetological Research Made Possible by Citizen Scientists. *In* R. E. Jung and J. C. Mitchell (eds.), Urban Herpetology. Herpetological Conservation V.3, Society for the Study of Amphibians and Reptiles. Salt Lake City, UT.
14. **Budischak, S.A.**, J.M. Hester, S.J. Price, and M.E. Dorcas. 2006. Natural history of *Terrapene carolina* (box turtles) in an urbanized landscape. *Southeastern Naturalist* 5:191-204.
15. Ripperton, J.G., P.A. Peroni, and **S.A. Budischak**. 2006. Effects of burial on seed germination and seedling performance in white campion (*Silene latifolia*). *Journal of the North Carolina Academy of Science* 122:29-38.

Manuscripts in Review, Submission and Preparation (available upon request)

1. Beechler, B.R., A.E. Jolles, S.A. Budischak, P.L.A.M. Corstjens, V.O. Ezenwa, M. Smith, R. Spaan, G. van Dam, and M. Steinauer. Natural history of schistosome infection in a free-living mammalian host population. (In Review)
2. **Budischak, S.A.**, A.E. Wiria, F. Hamid, L.J. Wammes, L. van Lieshout, E. Sartono, T. Supali, M. Yazdanbakhsh, and A.L. Graham. Resource competition drives infection severity in human malaria-hookworm co-infections. (Submitted)
3. Ezenwa, V.O., A.E. Jolles, **S.A. Budischak**, B.R. Beechler, and E. Gorsich. Causes and consequences of parasite interactions in African buffalo. Wildlife Disease Ecology: Linking Theory to Data and Application. Eds: K. Wilson, A. Fenton, and D. Tompkins. (book chapter, submitted)
4. van Leeuwen, A., A.L. Graham, C. Cressler, and **S.A. Budischak**. A dynamic energy budget model of host-parasite interactions and the emergence of bi-stable acute and chronic infections.
5. Leung, J.M., C. Hansen, **S.A. Budischak**, R. Neill*, R. Bowcutt, H.T. Chung, M. Shellman*, E.C. Cope, E. Gould, P. Loke, and A.L. Graham. The shock of the new: Rapid environmental effects on gut communities and systemic physiology of re-wilded mice.
6. **S. A. Budischak**, C. Hansen, A. Salamatian*, D. Navarrete*, H. Priddy*, and A. L. Graham. Complex interactions among nutrition, condition and immunity during *Trichuris muris* infection.

* co-authors are undergraduate mentees [1]corresponding author

Grants and Funding

NSF Research Coordination Network: Infectious Disease Evolution Across Scales Research Exchange. Cressler Lab, University of Nebraska. 2016.

NSF Research Coordination Network: Infectious Disease Evolution Across Scales Travel Award. 2015.

NSF Research Coordination Network: Ecoimmunology Graduate Travel Award. 2014.

NSF EEID Travel Award – EcoHealth conference in Kunming, China. October 2012.

Odum School of Ecology Small Grant. 2011. ($1,500)

NSF Doctoral Dissertation Improvement Grant. 2010. ($14,923)

Burroughs Wellcome Ecology and Evolution Travel Scholarship. 2010.

SICB Annual Meeting 2010 Student Travel Support. 2010.

Montana Ecology of Infectious Diseases IGERT Small Grant. 2009. ($2,500)

Ecology and Evolution of Infectious Diseases Graduate Travel Award. 2009, 2010.

David C. Grant Travel Award. 2005.

Fellowships

Writing in Science and Engineering Teaching Fellowship. Princeton University. 2016 - present.

NSF Integrative Graduate Education & Research Traineeship (IGERT) Fellowship. Montana-Ecology of Infectious Diseases. University of Montana. 2008-2010.

NSF Research Experience for Undergraduates (REU) Fellowship. University of Florida. 2004.

NSF Research Experience for Undergraduates (REU) Fellowship. Davidson College. 2003.

Awards

University of Georgia Robert C. Anderson Memorial Award. For alumna research excellence. 2016.

Woods Hole Immunoparasitology Meeting Presentation Award. April 2015.

University of Georgia Award of Excellence. Honor for top 1% of graduating class. 2014.

Solitary Glove Service Award, Odum School of Ecology. April 2014

UGA Graduate School Emerging Leaders Program. 2013.

NSF Innovation in Graduate Education Challenge. Second Place Winning team. 2013.
Retaining Women in STEM Careers: Graduate Students as the Building Blocks of Change.

Odum School of Ecology Frank Golley Memorial Scholarship. For leadership and academics. 2013.

Odum School of Ecology Best Student Paper Award. 2013.

Ecohealth Best Student Presentation Award. 2012.

Environmental Toxicology & Chemistry Best Student Paper Award. 2008.

Richard L. Hoffman Award. Virginia Herpetological Society best student presentation award. 2007

BBB – Biological Honor Society. 2002-2005.

ODK - National Leadership Honor Society. Member 2005 - Present.

Teaching Experience

Princeton University

- Instructor for grad/postdoc writing seminars: *Writing an Effective Scientific Research Article*. 2016.
- Mentor to 5 Senior Thesis students, one independent research student, and one REU student.

University of Georgia

- Co-Instructor and course designer. *Infectious films: Separating Fact from Fiction*. 2013.
- Independent research mentor for 3 REU students, one UGA veterinary student, and 12 UGA undergraduates, including serving as a Senior Thesis committee member for one.
- EcoReach instructor and curriculum development. Outreach in local K-12 schools. 2011-2014.
- Introduction to Ecoimmunology. *Physiological Ecology*. Guest lecturer. 2014.
- Climate Change and Disease. *Global Climate Change*. Guest lecturer. 2013, 2014.
- Quantifying Animal Behavior. *Animal Behavior*. Guest lecturer. 2013, 2014.

University of Montana

- *Statistical Thinking* - Designed and taught active learning experiment in Animal Physiology. 2010.
- Independent research mentor for an REU student

Virginia Tech

- *Conservation Biology*. Teaching Assistant. 2007.
- *Vertebrate Field Biology*. Teaching Assistant. 2006, 2007.
- *Vertebrate Physiological Ecology*. Teaching Assistant. 2006.
- *Pedagogy in Natural Resources*. Teaching Assistant. 2006.
- *Principals of Fisheries and Wildlife Management*. Teaching Assistant. 2005.
- Independent research mentor for 2 undergraduate students.

Davidson College

- Chemistry Department. Laboratory Teaching Assistant. Fall 2004 - Spring 2005.
- Biology Department. Laboratory Teaching Assistant. Fall 2002 - Spring 2005.
- Chemistry Tutor. Davidson College. Fall 2003 – Spring 2005.

Invited Talks

Context dependent costs of co-infection. University of Florida, Whitney Laboratory for Marine Bioscience. Distinguished REU Alumna Speaker. 2015.

Parasitism from the savanna to Savannah. Colorado College, Department of Biology. 2014.

Consequences of parasite co-infection. University of California Davis, School of Veterinary Medicine. 2014.

Consequences of parasite co-infection. Princeton University, Dept. of Ecology & Evolutionary Biology. 2014.

Professional Meetings

Woods Hole Immunoparasitology Meeting, 2016.
S. A. Budischak, C. Hansen, A. Salamatian, D. Navarrete, H. Priddy, and A. L. Graham. Complex interactions among nutrition, condition and immunity during *Trichuris muris* infection. (poster)

Ecology and Evolution of Infectious Diseases, Annual Conference, 2016.
S.A. Budischak, A.E. Wiria, F. Hamid, L.J. Wammes, L. van Lieshout, E. Sartono, T. Supali, M. Yazdanbakhsh, A.L. Graham. Resource competition drives infection severity in human malaria-hookworm co-infections. (talk)

Ecology and Evolution of Infectious Diseases, Annual Conference, 2015.
S.A. Budischak, A.E. Jolles, V.O. Ezenwa. Host responses shape the divergent fitness costs of infection. (poster)

Woods Hole Immunoparasitology Meeting, 2015.
S.A. Budischak, A.E. Jolles, V.O. Ezenwa. Experimental and longitudinal evidence for fitness costs of helminth infection in African buffalo. (talk)

Ecological Society of America, Annual Meeting, 2014.
S. A. Budischak, A.E. Jolles, V.O. Ezenwa. A tale of two worms: parasite species identity determines fitness cost of infection. (poster)

Research Coordination Network – Ecoimmunology Annual Meeting, 2014.
S.A. Budischak, K. Sakamoto, L.C. Megow, K. Cummings, J.F. Urban, V.O. Ezenwa. Resources influence immune-mediated interactions among co-infecting parasites. (talk)

Ecological Society of America, Annual Meeting, 2013.
S.A. Budischak, K. Sakamoto, J.F. Urban Jr., V.O. Ezenwa. Consequences of co-infection for hosts and parasites: importance of host nutrition and parasite species identity. (talk)

Ecology and Evolution of Infectious Diseases Annual Conference, 2013.
S.A. Budischak, K. Sakamoto, J.F. Urban Jr., V.O. Ezenwa. Resource limitation alters the consequences of coinfection for both hosts and parasites. (poster)

NSF/NIH Ecology and Evolution of Infectious Disease PI Meeting, 2013.
S.A. Budischak, K. Sakamoto, J.F. Urban Jr., V.O. Ezenwa. Resource limitation alters the consequences of coinfection for both hosts and parasites. (poster)

One Health Symposium: Breaking Barriers and Crossing Scales, 2013.
S.A. Budischak, K. Sakamoto, J.F. Urban Jr., V.O. Ezenwa. Resource limitation alters the consequences of coinfection for both hosts and parasites. (poster)

EcoHealth, 4th Biennial Conference, 2012.
S.A. Budischak, K. Sakamoto, J.F. Urban Jr., V.O. Ezenwa. Causes and consequences of parasite community composition. (talk)

Society for Integrative and Comparative Biology Annual Meeting, 2011.
S.A. Budischak, A.E. Jolles, V.O. Ezenwa. Untangling GI parasite communities: the importance of species identity and richness. (talk)

NSF/NIH Ecology of Infectious Diseases PI Meeting, 2010.
S.A. Budischak, A.E. Jolles, V.O. Ezenwa. Direct and indirect costs of co-infection in the wild: linking GI parasite communities, host hematology, and immune function. (talk)

Ecology and Evolution of Infectious Diseases Annual Conference, 2009.
S.A. Budischak, A.E. Jolles, V.O. Ezenwa. Untangling GI parasite communities: the importance of species identity and richness. (poster)

Ecological Society of America Annual Meeting, 2008.
Budischak, S.A., L.K. Belden, W.A. Hopkins. Effects of embryonic exposure to malathion on embryonic development and latent susceptibility to parasites. (talk)

Virginia Herpetological Society Fall Symposium, 2007.

Budischak, S.A., L.K. Belden, W.A. Hopkins. Effects of embryonic exposure to malathion on hatching success and latent susceptibility to parasites. (talk)

Introduction to Wildlife Diseases in the Mid-Atlantic Region, 2006.
Annual Summer Workshop of the Virginia Chapter of The Wildlife Society.

Ecological Society of America and International Congress of Ecology, 2005.
Budischak, S.A., J.G. Ripperton, P.A. Peroni. The effects of seed age on viability, germination, and seedling performance in white campion (*Silene latifolia*). (talk by Dr. Peroni)

Association of Southeastern Biologists, 2005.
Budischak, S.A., J.G. Ripperton, P.A. Peroni. The effects of seed age on viability, germination, and seedling performance in white campion (*Silene latifolia*). (poster)
Budischak, S.A., J.M. Hester, S.J. Price, M.E. Dorcas. Natural history of *Terrapene carolina* (box turtles) in an urbanized landscape. (poster)

Professional Service

Ecological Society of America – Disease Ecology Section Secretary-Treasurer. 2016- present.

EcoReach President. UGA Ecology outreach organization for K-12 science education. 2012-2014.

Reviewer for: Biology Letters, Journal of Animal Ecology, American Naturalist, PLOS One, Evolution, Canadian Journal of Zoology, Royal Society Open Science, International Journal for Parasitology, Veterinary Pathology, Pathogens, Environmental Toxicology & Chemistry

Professional Development

Infectious Disease Evolution Across Scales - Research Coordination Network. 2015-Present.
Network facilitating cross-scale disease research, including my collaboration with Dr. Cressler.

Macroecology of Infectious Diseases - Research Coordination Network. 2014-Present.
Collaborative research investigating global patterns of parasite infection and disease emergence.

***Entering Mentoring* participant.** NSF sponsored training course for REU mentors. 2013.

ESA Introductory and Advanced Structural Equation Modeling Workshops. 2013.

Ecology and Evolution of Infectious Diseases Workshops. 2009, 2010. Three-day workshops focused on developing skills to model and analyze ecological and evolutionary data.

Pathways to Scientific Teaching Workshop. 2009. Three-day workshop on developing learner-centered curricula and teaching interdisciplinary science courses.

References

Dr. Andrea Graham
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Dr. Sonia Altizer
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Dr. Clay Cressler
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