

CURRICULUM VITAE: SCOTT L. NUISMER
December 2018

ADDRESS

Department of Biological Sciences
University of Idaho
Moscow, ID 83844

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EDUCATION

B.S. Biology 1996. University of Utah, Salt Lake City, UT, 84112
Ph.D. Biology 2000. Washington State University, Pullman, WA, 99164. Graduate
Advisors: John N. Thompson and Richard Gomulkiewicz

APPOINTMENTS

Professor. Department of Mathematics (Affiliate). University of Idaho. Moscow, ID
83844. May 2014-Present.
Professor. Department of Biological Sciences. University of Idaho. Moscow, ID 83844.
July 2013-Present.
Associate Professor. Department of Biological Sciences. University of Idaho. Moscow,
ID 83844. June 2008-June 2013.
Assistant Professor. Department of Biological Sciences. University of Idaho. Moscow,
ID 83844. June 2003-May 2008.
NIH Post-Doctoral Fellow with Mark Kirkpatrick. Section of Integrative Biology C0930,
University of Texas, Austin, TX 78712. March 2002 – June 2003.
Post-Doctoral Associate with Mark Kirkpatrick. Section of Integrative Biology C0930,
University of Texas, Austin, TX 78712. January 2001 – March 2002.

FEDERAL GRANTS/CONTRACTS

DARPA D18AC00028. October 2018-March 2022. Prediction of Spillover Potential and
Interventional En Masse Animal Vaccination to Prevent Emerging Pathogen
Threats in Current and Future Zones of US Military Operation. \$9,669,372. Co-
PI's (all equal): Peter Barry, Brian Bird, Michael Jarvis, and S.L. Nuismer.
NIH R01GM122079. August 2016-April 2020. Collaborative research: a mathematical
theory of transmissible vaccines. \$1,009,921.00. PI: Scott Nuismer.
NSF STC DBI 0939454. August 2015-July 2016. BEACON: An NSF Center for the
Study of Evolution in Action. \$20,862. PI: Jim Bull
NSF DEB 1450653. April 2015-March 2020. A Bayesian approach to inferring the
strength of coevolution. \$251,014. PI: Scott Nuismer.
NSF STC DBI 0939454. June 2014-June 2015. BEACON: An NSF Center for the Study
of Evolution in Action. \$12,000. PI: Jim Bull
NSF DEB 1118947. September 2011-August 2015. MPS BIO: Developing a multivariate
theory of phenotypic coevolution. \$246,717. PI: Scott Nuismer.

- NSF DMS 0540392. July 2006-June 2014. Collaborative Research: A unified theoretical approach to community coevolution. \$725,000. PI: Scott Nuismer.
- NSF DEB 0343023. April 2004-March 2007. General genetic models of the geographic mosaic theory of coevolution. \$236,601. PI: Scott Nuismer.
- NSF DEB 0808281. April 2008-March 2010. Dissertation Research: The role of pathogen resistance in the establishment and persistence of polyploid lineages. \$8,980. PI: Scott Nuismer.
- NIH F32 GM65620-01. Gene flow and the coevolution of parasite range. March 2002-June 2003. \$43,278.

PEER REVIEWED PUBLICATIONS

1. Nuismer, S.L., Bob Week, M. Aizen. Coevolution slows the disassembly of mutualistic communities. *The American Naturalist*. In press.
2. Nuismer, S.L., May R, Basinski A, Remien C.H. 2018. Controlling epidemics with transmissible vaccines. *PLoS ONE* 13(5): e0196978.
3. MacPherson, A., S.P. Otto, and S.L. Nuismer. 2018. Keeping pace with the Red Queen: identifying the genetic basis of susceptibility to infectious disease. *Genetics*. 208:779-789.
4. Basinski, A.J. T.J. Varrelman, M.W. Smithson, R.H. May, C.H. Remien, and S.L. Nuismer. 2017. Evaluating the promise of recombinant transmissible vaccines. *Vaccine*. 36:675-682.
5. Bull, J.J., M.W. Smithson, and S.L. Nuismer. 2017. Transmissible viral vaccines. *Trends in Microbiology*. 26:6-15.
6. Nuismer, S.L. 2017. Rethinking conventional wisdom: are locally adapted parasites ahead in the coevolutionary race? *The American Naturalist*. 190:584-593.
7. Nuismer, S.L., C.E. Jenkins, and M.F. Dybdahl. 2017. Identifying coevolving loci using interspecific genetic correlations. *Ecology and Evolution*. <https://doi.org/10.1002/ece3.3107>.
8. MacPherson, A. and S.L. Nuismer. 2017. The probability of parallel genetic evolution from standing genetic variation. *Journal of Evolutionary Biology*. 30:326-337.
9. Nuismer S.L. 2016. Eradicating infectious disease using weakly transmissible vaccines. *Proceedings of the Royal Society of London Series B-Biological Sciences*. 283:20161903.
10. Paff, M.L., S.L. Nuismer, A.D. Ellington, I.J. Molineux, R. May, J.J. Bull. 2016. Design and engineering of a transmissible antiviral defense. *Journal of Biological Engineering*. doi: 10.1186/s13036-016-0033-4
11. Paff, M.L., S.L. Nuismer, A. Ellington, I.J. Molineux, J.J. Bull. 2016. Virus wars: using one virus to block the spread of another. *PeerJ*. 4:e2166 <https://doi.org/10.7717/peerj.2166>
12. Nuismer S.L. and M.F. Dybdahl. 2016. Quantifying the coevolutionary potential of multi-step immune defenses. *Evolution*. 70: 282-295.
13. MacPherson, A., P.A. Hohenlohe, and S.L. Nuismer. 2015. Trait dimensionality explains widespread variation in local adaptation. *Proceedings of the Royal*

- Society of London Series B-Biological Sciences*. Volume 282. doi: 10.1098/rspb.2014.1570
14. Nuismer, S.L. and L.J. Harmon. 2015. Predicting rates of interspecific interactions from phylogenetic trees. *Ecology Letters*. 18:17-27.
 15. Heath, K. and S.L. Nuismer. 2014. Connecting functional and statistical definitions of genotype by genotype interactions in coevolutionary studies. *Frontiers in genetics*. 7:77
 16. Dybdahl, M.F., C.E. Jenkins, and S.L. Nuismer. 2014. Identifying the molecular basis of host-parasite coevolution: merging models and mechanisms. *The American Naturalist*. 184:1-13.
 17. Debarre, F., S.L. Nuismer, and M. Doebeli. 2014. Multidimensional (Co)evolutionary stability. *The American Naturalist*. 184:158-171.
 18. Ridenhour, B.J. and S.L. Nuismer. 2014. A quantitative genetic approach for predicting ecological change in biological communities. *Theoretical Ecology*. 7:137-148.
 19. Jones, E., S.L. Nuismer, and R. Gomulkiewicz. 2013. Revisiting Darwin's conundrum reveals a twist on the relationship between phylogenetic distance and invasibility. *PNAS*. 110:20627-20632.
 20. Blanquart, F., O. Kaltz, S.L. Nuismer, and S. Gandon. 2013. A practical guide to measuring local adaptation. *Ecology Letters*. 16:1195-1205.
 21. Nuismer, S.L., Bascompte, J., and Jordano, P. 2013. Coevolution and the architecture of mutualistic networks. *Evolution*. 67:338-354.
 22. Nuismer, S.L., A. MacPherson, and E.B. Rosenblum, 2012. Crossing the threshold: gene flow, dominance, and the critical level of standing genetic variation required for adaptation to novel environments. *Journal of Evolutionary Biology*. 25:2665-2671.
 23. Poullain, V. and S.L. Nuismer. 2012. Infection genetics and the likelihood of host shifts in coevolving host-parasite interactions. *The American Naturalist*. 180: 618-628.
 24. Blanquart, F., S. Gandon, and S.L. Nuismer. 2012. The effects of migration and drift on local adaptation to a heterogeneous environment. *Journal of Evolutionary Biology*. 25:1351-1363.
 25. Gilman, RT, and D.C. Jhwueng, and S.L. Nuismer. 2012. Coevolution in multidimensional trait space favors escape from parasites and pathogens. *Nature*. 483:328-330
 26. Oswald, B. and S.L. Nuismer. 2011. A unified model of autoployploid establishment and evolution. *The American Naturalist*. 178: 687-700.
 27. Oswald, B. and S.L. Nuismer. 2011. Neopolyploidy and diversification in *Heuchera grossulariifolia*. *Evolution*. 65:1667-1679.
 28. Yoder J.B. and S.L. Nuismer. 2010. When does coevolution promote diversification? *The American Naturalist*. 176: 802-817.
 29. Gomulkiewicz, R., R. Holt, M. Barfield, S.L. Nuismer. 2010. *Evolutionary Applications*. 3:97-108.
 30. Nuismer, S.L., R. Gomulkiewicz, and B.J. Ridenhour. 2010. When is correlation coevolution? *The American Naturalist*. 175: 525-537.

31. Gandon, S. and S.L. Nuismer. 2009. Interactions between genetic drift, gene flow and selection mosaics drive parasite local adaptation. *The American Naturalist*. 173: 212-224
32. Nuismer, S. L., S. P. Otto, and F. Blanquart. 2008. When do host-parasite interactions drive the evolution of non-random mating? *Ecology Letters*. 11:937-946.
33. Nuismer, S.L. and S. Gandon. 2008. Moving beyond common garden and transplant designs: insights into the causes of local adaptation in species interactions. *The American Naturalist*. 171:658-668.
34. Nuismer, S.L. and B.J. Ridenhour. 2008. The contribution of parasitism on floral traits in *Heuchera grossulariifolia*. *Journal of Evolutionary Biology*. 21:958-965.
35. Otto, S.P., M.R. Servedio, S.L. Nuismer. 2008. Frequency-dependent selection and the evolution of assortative mating. *Genetics*. 179:2091-2112.
36. Oswald, B. and S.L. Nuismer. 2007. Neopolyploidy and pathogen resistance. 2007. *Proceedings of the Royal Society of London Series B-Biological Sciences*. 274:2393-2397
37. Nuismer, S.L., B.J. Ridenhour, B. Oswald. 2007. Antagonistic coevolution mediated by phenotypic differences between quantitative traits. *Evolution*. 61:1823-1834.
38. Ridenhour, B.J. and S.L. Nuismer. 2007. Polygenic traits and parasite local adaptation. *Evolution*. 61:368-376.
39. Gomulkiewicz, R., D.M. Drown, M.E. Dybdahl, W. Godsoe, S.L. Nuismer, K.M. Pepin, B.J. Ridenhour, C.I. Smith, J.B. Yoder. 2007. Dos and don'ts of testing the geographic mosaic theory of coevolution. *Heredity*. 98(5):249
40. Nuismer, S.L. and J.N. Thompson. 2006. Coevolutionary alternation in antagonistic interactions. *Evolution*. 60:2207-2217.
41. Nuismer, S.L. 2006. Parasite local adaptation in a geographic mosaic. *Evolution*. 60:24-30.
42. Nuismer, S.L., and S.P. Otto. 2005. Host-parasite interactions and the evolution of gene expression. *PLoS Biology*. 3(7):1283-1288.
43. Nuismer, S.L. and B.M. Cunningham. 2005. Selection for phenotypic divergence between diploid and autotetraploid *Heuchera grossulariifolia*. *Evolution*. 59:1928-1935.
44. Nuismer, S.L., M. Doebeli, and D. Browning. 2005. The coevolutionary dynamics of antagonistic interactions mediated by quantitative traits with evolving variances. *Evolution*. 59:2073-2082.
45. Nuismer, S. L., and S. P. Otto. 2004. Host-parasite interactions and the evolution of ploidy. *PNAS* 101:11036-11039. (Editor's choice; Science)
46. Otto, S. P., and S. L. Nuismer. 2004. Species interactions and the evolution of sex. *Science*. 304:1018-1020.
47. Nuismer, S. L., and M. Doebeli. 2004. Genetic correlations and the coevolution of three species systems. *Evolution* 58:1165-1177.
48. Kirkpatrick, M., and S. L. Nuismer. 2004. Sexual selection can constrain sympatric speciation. *Proceedings of the Royal Society of London Series B-Biological Sciences* 271:687-693.

49. Thompson, J.N., S.L. Nuismer, K.F. Merg. 2004. Plant polyploidy and the evolutionary ecology of plant/animal interactions. *Biological Journal of the Linnean Society*. 82:511-519.
50. Gomulkiewicz, R., Nuismer, S.L., and J.N. Thompson. 2003. Coevolution when a mutualism is not always a mutualism. *The American Naturalist*. 162: S80-S93
51. Nuismer, S. L., J. N. Thompson, and R. Gomulkiewicz. 2003. Coevolution between hosts and parasites with partially overlapping geographic ranges. *Journal of Evolutionary Biology*. 16: 1337-1345
52. Nuismer, S.L., R. Gomulkiewicz, and M. Morgan. 2003. Coevolution in temporally variable environments. *The American Naturalist*. 162: 195-204.
53. Nuismer, S. L., and M. Kirkpatrick. 2003. Gene flow and the coevolution of parasite range. *Evolution*. 57:746-754.
54. Thompson, J. N., S. L. Nuismer, and R. Gomulkiewicz. 2002. Coevolution and maladaptation. *Integrative and Comparative Biology* 42:381-387.
55. Nuismer, S.L. and J.N. Thompson. 2001. Plant polyploidy and non-uniform effects on insect herbivores. *Proceedings of the Royal Society of London B*. 268: 1937-1940.
56. Gomulkiewicz, R., J.N. Thompson, R.D. Holt, S.L. Nuismer and M.E. Hochberg. 2000. Hot spots, cold spots, and the geographic mosaic theory of coevolution. *The American Naturalist*. 156: 156-174.
57. Nuismer, S.L., J.N. Thompson and R. Gomulkiewicz. 2000. Coevolutionary clines across selection mosaics. *Evolution* 54: 1102-1115.
58. Nuismer, S. L., J. N. Thompson and R. Gomulkiewicz. 1999. Gene flow and geographically structured coevolution. *Proceedings of the Royal Society of London B*. 266: 605-609.
59. Alder, N. N., W. T. Pockman, J. S. Sperry and S. Nuismer. 1997. Use of centrifugal force in the study of xylem cavitation. *Journal of Experimental Botany* 48: 665-674.

BOOK CHAPTERS

Ridenhour, B.J. and S.L. Nuismer. Trait-mediated indirect interactions and the coevolutionary process. In Ohgushi, T., Schmitz, O.J. & Holt, R.D. (In press) Interaction, Richness and Complexity: Ecological and Evolutionary Aspects of Trait-Mediated Indirect Interactions, Cambridge University Press, Cambridge, UK.

BOOKS

Introduction to Coevolutionary Theory. 2017. W.H. Freeman and Company. New York.

INVITED TALKS

Evo WIBO plenary address. From tales of coevolution to a coevolutionary synthesis.
April 2018.

University of Tennessee. Evaluating the promise of a transmissible vaccine. November 2017.

University of Toronto. Evaluating the promise of a transmissible vaccine. October 2017.

Canadian Ecology and Evolution meetings. May 2017.
 Ohio St. University. November 2015. Integrating coevolution into the tree of life.
 CNRS, Montpellier, France. June 2014. Coevolution in two-step systems.
 University of Illinois, Champagne, Illinois. May 2013. Coevolution and the architecture of mutualistic networks.
 Portland State University, Portland, Oregon. November 2012. The dimensionality of local adaptation
 University of Arizona. Tucson, Arizona. February 2012. Plant polyploidy and species interactions
 Indiana University. Bloomington, Indiana. November 2011. The coevolution of mutualistic networks.
 Ohio St. University. Mathematical Biosciences Institute. April 2011. What can studies of local adaptation and trait matching tell us about coevolution?
 CNRS. Montpellier, France. January, 2010. When is correlation coevolution?
 University of Fribourg. Fribourg, Switzerland. September 2009. Plant polyploidy and the evolutionary ecology of inerspecific interactions.
 University of Fribourg. Fribourg, Switzerland. September 2009. Interspecific interactions and the diversification of polyploidy lineages.
 University of Utah. Department of Mathematics. April 2009. When is correlation coevolution?
 University of California, Davis. Population Biology Program. April 2008. Do we need a geographic mosaic theory to understand species interactions?
 Cornell University. Department of Biology. March 2007. Host-parasite interactions and the evolution of ploidy.
 New Mexico St. University. Department of Biology. February 2007. Host-parasite interactions and the evolution of ploidy.
 Society for the Study of Evolution Symposium. June 2006. Alternative perspectives on evolutionary dynamics. Stony Brook University.
 Ohio St. University. Mathematical Biosciences Institute. February 2006. Polygenic traits and parasite local adaptation.
 Washington St. University. Plant Pathology. Fall 2005. Host parasite interactions and the evolution of ploidy
 Washington St. University. Entomology. Fall 2004. Plant-insect interactions and the diversification of polyploid lineages.
 University of Minnesota. Community Genetics. Fall 2003. Host parasite interactions and the evolution of ploidy.
 Washington St. University. Biological Sciences. Fall 2003. Host parasite interactions and the evolution of ploidy.
 Colorado St. University. Department of Biology. Coevolution in geographically structured interactions. Spring 2002.

EXTRAMURAL SERVICE

Associate Editor, *The American Naturalist*. January 2013-Present.
 Associate Editor, *Evolution*. January 2009-December 2012.
 Organizer for the EVO-WIBO meetings 2010.

Organizer for Mathematical Biosciences Institute workshop “Coevolution and the Ecological Structure of Plant-insect Communities”. April 2011.
Panelist for NSF Mathematical Biology Program
Panelist for NSF Dissertation Improvement Grants
Panelist for NSF Evolutionary Processes Cluster
Reviewer for *Science*, *Nature*, *PNAS*, *PLoS Biology*, *Evolution*, *American Naturalist*, *Genetics*, *Proceedings of the Royal Society of London, Series B.*, *Ecology Letters*, and others.
PEES (Palouse Ecology, Evolution, and Systematics) organizer (Fall 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2013, 2014, 2015)
Local organizer for EVO-WIBO (Spring 2004, 2006, 2008, 2012, 2014, 2016)

INTRAMURAL SERVICE

REIC Committee (2014-present)
BCB Curriculum committee (2017-present)
BCB Board (2015-present)
Seed grant review panel (University). Spring 2012
Research Council (University). 2006-2008
Stillinger committee (College). 2011-present
Education and Research infrastructure committee (Department). 2011-present
Vision committee (Department). 2012-present

FELLOWSHIPS AND AWARDS

Research and Creative Activity Excellence Award, University of Idaho, 2016
Early Career Faculty Award, University of Idaho, College of Science, 2008
James King Graduate Fellowship, Washington State University, Department of Biological Sciences, 2000
Abelson Graduate Fellowship, Washington State University, Department of Zoology, 1996

TEACHING

Ecology and Population Biology: 2004, 2005, 2006, 2007, 2008, 2009, 2011, 2012, 2013, 2015, 2016, 2018
Evolutionary Ecology: 2005, 2007, 2009, 2011, 2013, 2015
Modeling Evolutionary Dynamics: 2007
The Evolution of Infectious Disease: 2016
Epidemiological Modeling: 2018