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FREDERICK R. ADLER

Curriculum vitae

Professor

Department of Mathematics and Department of Biology

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Research interests: Mathematical ecology, mathematical epidemiology, mathematical immunology, biodiversity, optimal foraging theory, evolutionary ecology, cystic fibrosis

EDUCATION

Ph.D. Cornell University, Applied Mathematics, August 1991

Thesis title: *Models of Structured Populations*

Thesis advisor: Simon A. Levin

M.S. Cornell University, Applied Mathematics, July 1989

B.A. Harvard-Radcliffe College, Mathematics, June 1984

HONORS AND AWARDS

2009 Faculty of 1000 Biology

2009 University of Utah Distinguished Mentor Award

1989-90 Mathematical Sciences Institute Graduate Fellow

1985-87 A.D. White Fellowship, Cornell University

1984 Phi Beta Kappa, Harvard University

PROFESSIONAL EXPERIENCE

2004- Professor, Department of Mathematics and
Department of Biology, University of Utah

2000 Visiting Faculty Fellow, Department of Ecology and Evolutionary Biology
Princeton University

1998-04 Associate Professor, Department of Mathematics and
Department of Biology, University of Utah

1993-98 Assistant Professor, Department of Mathematics and
Department of Biology, University of Utah

1991-92 Visiting Postdoctoral Researcher, Center for Population Biology
University of California at Davis
Marc Mangel, Mentor

1987-90 Teaching Assistant, Cornell University

1984-85 Research Assistant, National Water Alliance, Washington, D.C.

RECENT GRANTS

- 2011-13** Mitochondrial fitness variation in a naturally replicated evolutionary experiment (NSF, J. Seger, PI)
- 2011-12** Mathematical modeling and statistical analysis of interacting respiratory infections (University of Utah, F. R. Adler)
- 2009-14** Pathogen adaptation to specific host genotypes (NSF, W. Potts, PI)
- 2007-11** The Ecology and Evolution of the Common Cold (James S McDonnell Foundation, F. Adler, PI)
- 2006-08** Polymicrobial disease and inflammation in cystic fibrosis (NIH, T. G. Liou, PI)
- 2004-08** The Effect of Anthropogenic Disturbance on the Dynamics of Sin Nombre (NSF, D. Dearing, PI)
- 2004-07** How Competition and Parasitism Control Diversity in Ant Communities: Testing a Mechanistic Theory, (NSF, D. H. Feener, PI)

POST-DOCTORAL SCHOLARS

- 2011-** Suma Ghosh
- 2010-** Samit Bhattacharyya
- 2010-** Nicole Lewis-Rogers
- 2009-11** Subhra Bhattacharya
- 2008-11** Peter Kim
- 2007-10** Damon Toth
- 2005-07** Jonathan Forde

GRADUATE STUDENTS: PhD

- 2010-** Benjamin Hardisty, Department of Biology
- 2009-** Andrew Basinski, Department of Mathematics
- 2007-** James Moore, Department of Mathematics
- 2007-** Chris Remien, Department of Mathematics
- 2007-** Erica Graham, Department of Mathematics
- 2006-11** Sean Laverty, Department of Mathematics
- 2005-10** Giao Huynh, Department of Mathematics
- 2004-08** Brendan O'Fallon, Department of Biology
- 2002-08** Luciano Valenzuela, Department of Biology
- 2003-09** Amber Smith, Department of Mathematics
- 2003-10** Courtney Davis, Department of Mathematics
- 2002-07** Meagan McNulty, Department of Mathematics
- 2002-** Aaron McDonald, Department of Mathematics
- 2002-07** John Zobitz, Department of Mathematics
- 2002-08** Colby Tanner, Department of Biology
- 1999-06** Tim Brown, Department of Biology
- 1996-02** Thomas Hills, Department of Biology, PhD

1993-00 Stephen Proulx, Department of Biology, PhD

1996-00 Adam Kay, Department of Biology, PhD

RECENT COURSES TAUGHT

- 2011** Mathematical Models in Biology, Biology 5910
- 2011** Mathematics for Life Scientists, Mathematics 1170
- 2011** Mathematical Biology II, Mathematics 5120
- 2010** Mathematical Biology I, Mathematics 5110
- 2010** Advanced Statistics in R, Biology 6500
- 2010** Summer REU in mathematical biology
- 2010** Mathematical Biology II, Mathematics 6780
- 2009** Science and Literature (with K. Coles) Math 5750
- 2009** Urban Ecology, Biology 5440
- 2008-09** Calculus for Biologists (Math 1170-1180)
- 2007** Science and Literature (with K. Coles), Biology 5960-5
- 2007** Urban Ecology (with C. Tanner), Biology 5960-3

EDITORIAL BOARDS

- 1998-02** Ecology, Ecological Applications, Ecological Monographs
- 2007-** PLoS ONE
- 2008-** The American Naturalist
- 2009-** Ecology Letters

CONFERENCES ORGANIZED

- 2010** Organized Oral Session on Plant Signaling, Ecology Society of America
- 2009** Quantitative Biology Workshop
Utah Symposium on Science and Literature:
Mathematics, Language and Imagination
- 2008** RTG Workshop: Mathematical Perspective on Cancer Immunology
Utah Symposium on Science and Literature: Measuring Scale
- 2005** Utah Symposium on Science and Literature: Some Re-Assembly Required
- 2003** Session Chair, Gordon Conference on Theoretical Ecology
- 2003** VIGRE Minicourse on Biological Invasions
- 1995** Fall Quarter of Special Year in Mathematical Biology
Organized Mathematics 675 with visiting lecturers
Minisymposium on Territoriality with 6 invited speakers

References

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- [2] P-I Ku, A. K. Miller, J. Ballew, V. Sandrin, F. R. Adler, and S. Saffarian. Identification of pauses during formation of HIV-1 Virus like particles. *Biophysical Journal*, 105:2262–2272, 2013.
- [3] E. J. Graham and F. R. Adler. Long-term models of oxidative stress and mitochondrial damage in insulin resistance progression. *Journal of Theoretical Biology*, 340:238-250, 2013.
- [4] D. J. A. Toth, A. V. Gundlapalli, W. A. Schell, K. Bulmahn, T. E. Walton, C. W. Woods, C. Coghill, F. Gallegos, M. H. Samore, and F. R. Adler. Quantitative models of the dose-response and time course of inhalational anthrax in humans. *PLoS Pathogens*, 9:e1003555, 2013.
- [5] F.R. Adler and C. J. Tanner. *Urban Ecosystems: Ecological Principles for the Built Environment* Cambridge University Press, 2013.
- [6] C. L. Davis and F. R. Adler. Mathematical models of memory CD8+ T-cell repertoire dynamics in response to viral infections. *Bulletin of Mathematical Biology*, 75:491-522, 2013.
- [7] F. R. Adler and P. S. Kim. Models of contrasting strategies of rhinovirus immune manipulation. *Journal of Theoretical Biology*, 327:1-10, 2013.
- [8] A. Smith, F. R. Adler, R. M. Ribeiro, R. N. Gutenkunst, J. L. McAuley, J. A. McCullers and A. S. Perelson. Kinetics of coinfection with influenza A virus and *Streptococcus pneumoniae*. *PLoS Pathogens*, 9:491-522, 2013.
- [9] F.R. Adler. *Modeling the Dynamics of Life: Calculus and Probability for Life Scientists: Third edition*. Brooks/Cole, Pacific Grove, 2012.
- [10] S. Bhattacharya and F. R. Adler. A time since recovery model with varying rates of loss of immunity. *Bulletin of Mathematical Biology*, 84:2810–2819, 2012.

- [11] T. G. Liou, F. R. Adler, R. H. Keogh, Y. Li, J.L. Jensen, W. Walsh, K. Packer, T. Clark, H. Carveth, J. Chen, S. L. Rogers, C. Lane, J. Moore, A. Sturrock, R. Paine III, D. R. Cox, and J. R. Hoidal. Sputum biomarkers and the prediction of clinical outcomes in patients with cystic fibrosis. *PLoS ONE*, 7:e42748, 2012.
- [12] J. Waite, A. Henry, F. R. Adler, and D. Clayton. Sex-specific effects of an avian malaria parasite on an insect vector: support for the resource limitation hypothesis. *Ecology*, 93:2448–2455, 2012.
- [13] Remien, C.H. and Adler, F.R. and Waddoups, L. and Box, T.D. and Sussman, N.L. Mathematical modeling of liver injury and dysfunction after acetaminophen overdose: Early discrimination between survival and death. *Hepatology*, 56:727–734, 2012
- [14] J.M.C. Pearce-Duvet, M. Moyano, F.R. Adler, and D.H. Feener. Fast food in ant communities: how competing species find resources. *Oecologia*, 167: 229-240, 2011.
- [15] G.T. Huynh and F.R. Adler. Alternating Host Cell Tropism Shapes the Persistence, Evolution and Coexistence of Epstein–Barr Virus Infections in Human. *Bulletin of Mathematical Biology*, 73:1754–1773, 2011.
- [16] G.T. Huynh and F.R. Adler. Mathematical modeling the age dependence of Epstein-Barr virus associated infectious mononucleosis. *Mathematical Medicine and Biology*, 29:245-261, 2011.
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- [18] A.M. Smith, J.A. McCullers, and F.R. Adler. Mathematical model of a three-stage innate immune response to a pneumococcal lung infection. *Journal of Theoretical Biology*, 276:106–116, 2011.
- [19] A.M. Smith, F.R. Adler, J. L. McAuley, R. N. Gutenkunst, R. M. Ribeiro, J. A. McCullers, and A. S. Perelson. Effect of 1918 PB1-F2 expression on influenza A virus infection kinetics. *PLoS Computational Biology*, 7:e1001081, 2011.
- [20] S. R. Proulx and F.R. Adler. The standard of neutrality: still flapping in the breeze?. *Journal of Evolutionary Biology*, 23:1339-1350, 2010.
- [21] J. Seger, W.A. Smith, J.J. Perry, J. Hunn, Z.A. Kaliszewska, L. La Sala, L. Pozzi, V.J. Rowntree, and F.R. Adler. Gene genealogies strongly distorted

- by weakly selected mutations in constant environments. *Genetics*, 184:529-545, 2010.
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- [23] A.M. Smith, F.R. Adler, and A.S. Perelson. An accurate two-phase approximate solution to an acute viral infection model. *Journal of Mathematical Biology*, 60:711-726, 2010.
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- [32] F. R. Adler and E. G. LeBrun and D. H. Feener Jr.. Maintaining diversity in an ant community: Modeling, extending, and testing the dominance-discovery tradeoff. *The American Naturalist* 169:323–333, 2007.

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- [62] F. R. Adler and D. Grunbaum. Evolution of forager responses to inducible defenses. In C. D. Harvell and R. Tollrian, editors, *Ecology and Evolution of Inducible Defenses*, pages 259–285. Princeton University Press, 1999.
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