

David M. Rand - Curriculum Vitae

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PERSONAL:

Date of Birth: 13 November 1956
Place of birth: Cambridge, Massachusetts
Address: Department of Ecology and Evolutionary Biology,
80 Waterman Street, Box G-W, Brown University,
Providence, RI 02912;
Ph: (401) 863-2890 (off.), -1063 (lab); FAX: 401 863-2166;
E-mail: David_Rand@brown.edu
Website: www.davidrandlab.org

EDUCATION:

9/83-8/87 Yale University, Department of Biology, Ph. D. September 1987.
9/75-6/80 Harvard College, B. A., Biology, *cum laude*, June 1980.
9/74-6/75 Northfield Mt. Heron School, Northfield, MA
9/71-6/74 Lincoln-Sudbury Regional High School, Sudbury, MA

RESEARCH INTERESTS

Molecular population genetics, comparative genomics and evolution; coevolution of nuclear and mitochondrial genomes; mitochondrial aging; genomics of thermal selection; case studies with *Drosophila*; barnacles, and *Fundulus*

PROFESSIONAL EXPERIENCE:

7/13-present Stephen T. Olney Professor of Natural History, Brown University
7/03-present Professor of Biology, Brown University, Providence, RI
7/97-6/03 Associate Professor of Biology, Brown University, Providence, RI
7/91-6/97 Assistant Professor of Biology, Brown University, Providence, RI
1/91-6/91 Adjunct Assistant Professor of Biology, Brown University, Providence RI
1/88-6/91 Postdoctoral Fellow, Population Genetics, Museum of Comparative
Zoology Laboratories, Harvard University
9/87-12/87 Postdoctoral Fellow, Institute of Marine Biology, Department of Biology,
University of Crete, Greece
9/83-6/86 Teaching Assistant, Yale University
9/81-6/83 Biology and Mathematics Teacher, St. Albans School, Washington, D. C.
9/80-6/81 Teaching Fellow in Biology, Phillips Academy, Andover, MA
1979, 1980 Research Assistant, Homing Pigeon Navigation, Dr. Charles Walcott,
SUNY, Stony Brook, (summers).
1977, 1978 Research Assistant, Seabird Ecology Study, Nome, Alaska, Dr. William
H. Drury, NOAA, (summers and fall semester '78).

PROFESSIONAL ACTIVITIES:

Chair Department of Ecology and Evolutionary Biology, 7/2013-present
Director NSF IGERT Training grant in Reverse Ecology, 2010-2017
Brown University Center for Computational Molecular Biology,
8/2011-8/2013
NIH COBRE Center for Computational Biology of Human Disease,
Brown University, 2016-2021

President American Genetic Association, 2009

Fellow American Association for the Advancement of Science, 2011

Associate Editor: Molecular Biology and Evolution, 1997-2000; 2000-2003
Genetics, 2004 – 2009
BioScience, 2005-2012
PloS Genetics, Guest Associate Editor 2013-present

Awards and Honors: Deans Award for Teaching in Biology, Spring 2013; Elected Chair, Gordon Research Conference on Molecular Evolution, 2008

Panel Member: NSF Population Biology 10/95, 10/97, 4/98, 4/05, NSF Science and Technology Center Site Visit Panel, 10/09, NIH Program Project Advisory Panel, 7/99, NIH Special Emphasis Panel 3/05, 11/06; NIH NRSA Panel 7/06; NIH Genetic Variation and Evolution 2/2007, NIH Genetic Variation and Evolution (GVE) Panel, Regular Member 10/2008-6/2012

Memberships: American Association for the Advancement of Science, American Genetic Association, Genetics Society of America, Society for the Study of Evolution, Society for Molecular Biology and Evolution

Reviewer: *American Naturalist*, *BMC Biology*, *BMC Genomics*, *BMC Evolutionary Biology*, *Evolution*, *Genetics*, *Genome Research*, *Journal of Molecular Evolution*, *Molecular Biology and Evolution*, *PLoS Biology*, *PLoS Genetics*, *PNAS*, *Nature*, *Science*, NSF Population Biology, NSF Systematics, NSF Eukaryotic Genetics, NSERC

Expert Witness: DNA testimony in forensic cases in Rhode Island 1993-1996

GRANTS AND FELLOWSHIPS:

"Nuclear-Mitochondrial Fitness Interactions in *Drosophila*", NIH General Medicine, 2R01GM067862-13, \$1,447,953, 4/01/17 – 3/31/20, Dr. David Rand, PI.

"Center for Biomedical Research Excellence: Center for Computational Biology of Human Disease", NIH General Medicine, 1P20GM109035-01, \$11,521,659, 6/1/2016-2/28/21, Dr. David Rand, PI.

"Mechanisms for Nutrient Modulation of Mitochondrial Dynamics and Metabolism", DEANS Award, Division of Biology and Medicine, Brown University, \$80,000, 7/1/2015-6/30/2016, Dr. Phillip Gruppuso, Dr. David Rand, co-PIs.

"Cigarette Smoke Effects on Mitochondria—From Flies to Lungs", DEANS Award, Division of Biology and Medicine, Brown University, \$80,000, 7/1/2014-6/30/2015, Dr. Sharon Rounds, Dr. David Rand, co-PIs.

"Nuclear-Mitochondrial Fitness Interactions in *Drosophila*", NIH General Medicine, 2R01GM067862-09, \$1,351,682, 8/01/12 – 7/31/17, Dr. David Rand, PI., Dr. Zhijin Wu, co-PI.

- "IGERT: Reverse Ecology: Computational Integration of Genomes, Organisms, and Environments", NSF DGE-0966060, \$2,976,843, 8/01/2010 – 7/31/2017, Dr. David M. Rand, PI, with co-PIs Drs. Zoe G. Cardon, Erika Edwards, Sorin C. Istrail, Mitchell L. Sogin.
- "Mitochondrial Genetics of Aging in *Drosophila*", NIH National Institute on Aging, 1R01AG027849, \$1,614,096, 10/01/09 – 9/30/2015, Dr. David Rand, PI.
- "American Genetic Association Symposium: The Genetics and Genomics of Environmental Change" NSF DEB 0926150, \$25,000, 6/08/2009 – 6/07/2010, Dr. David Rand, PI.
- "Nuclear-Mitochondrial Fitness Interactions in *Drosophila*", NIH General Medicine, 2R01GM067862, \$1,267,400, 8/01/08 – 7/31/12, Dr. David Rand, PI.
- "Evolutionary Response to Nanomaterial Exposure in the Environment: Functional Genomics of C60-Resistance in *Drosophila*", Brown University Seed Fund Program, \$55,000, P.I. D.M Rand, with K. Wharton (MCB) and R. Hurt (Engineering).
- "Rhode Island EPSCoR: Catalyzing a Research, Education and Innovation Network" NSF EPS 05-54548, \$6,750,000, 7/06 – 11/09, Dr. Jeff Seeman, URI, P.I. Dr. D. Rand, Brown University Graduate Director (\$375,000 in graduate fellowships)
- "Nuclear-mitochondrial fitness interactions in *Drosophila*", NIH General Medicine, R01 GM067862, \$1,095,301, 8/01/04 – 7/31/08, Dr. David Rand, PI; Dr. Bill Ballard, co Investigator.
- "Genetic architecture of thermal selection in *Drosophila*", NSF Population Biology, DEB 0343464, \$536,000, 3/01/04 – 2/28/08, Collaborative Research Award with George Gilchirst at William and Mary (\$281,000 to Brown University).
- "Nucleotide polymorphism in heterogeneous environments: MPI in *Semibalanus*" NSF Population Biology DEB 0108500, \$262,000, 9/1/01 – 8/31/04, Dr. David Rand, PI.
- "Recombination, dominance, and selection on amino acid mutations" NSF Population Biology DEB 9981497, \$172,367, 3/1/00 - 2/28/02, Dr. David Rand, PI, Dan Weinreich, co-PI.
- "Longevity and candidate gene polymorphisms in *Drosophila*", NIH-1R01AG16632-01, \$1,505,510, 7/1/99 - 6/30-04, Dr. Marc Tatar, PI; Dr. David Rand, Co-PI.
- "US-France Cooperative Research: Molecular population genetics of New World and Old World *Drosophila*" NSF International Programs INT-9815899, \$6,740, 3/1/99 - 2/29/00; \$15,460 3/01-4/03 Dr. David Rand, PI, Dr. Michel Veuille, collaborator, Univ. of Paris.
- "Evolutionary dynamics of mitochondrial DNA" NSF Population Biology DEB 9707676, 9/97-8/2000, \$210,000, Dr. David Rand, PI.
- "Molecular Ecological Genetics of the Acorn Barnacle" NSF Population Biology #BSR-

9527709, \$215,000 Dr. David Rand, PI, Dr. Mark Bertness Co-P.I. 3/96 - 2/99.

"An Automated DNA Sequencer for Brown University" NSF Biological Instrumentation and Resources #BIR-9513001, Dr. David Rand, PI, Dr. Edward Hawrot Co-P.I. 12/95 - 11/96, \$70,000.

"Experimental Population Genetics of *Drosophila* Mitochondrial DNA", NSF Population Biology #BSR-9120293, Dr. David Rand, PI. 1/15/92 - 6/14/97, \$602,000.

"The Evolution and Maintenance of Asexuality in the Planarian *Dugesia tigrina*"(with A. Fausto-Sterling, Johanna Schmitt, Lisa Brooks), Biomedical Research Support Grant, Brown University, 7/91-6/92, \$7,000

NIH NRSA Postdoctoral Fellowship, "Population Genetics of Mitochondrial DNA Size Variation", 1988-1990, \$68,000

Grants-in-aid-of-Research, Sigma Xi, February 1986, \$500

NIH Predoctoral Training Grant in Genetics, Yale University 1984-1987

Dudley Leyland Wadsworth Fellowship, Yale University, 1983-1984

GRANTS TO GRADUATE STUDENTS AND POSTDOCTORAL FELLOWS

"Mitochondrial genes and TOR signaling in *Drosophila*". NIH/NIA Individual Predoctoral Kirschstein-NRSA Fellowship to Promote Diversity in Health-Related Research (F31), Awarded to John Santiago 7/2016 – 6/2019, ~\$95,000

"Ecological genomics of the acorn barnacle" NSF GRFP to Joaquin Nunez, 4/2015; proposal prepared with input and editing from Rand prior to applying to Brown University.

"A Mitochondrial Hub for Dietary Restriction and Aging" NIH/NIA Individual Predoctoral Kirschstein-NRSA Fellowship to Promote Diversity in Health-Related Research (F31), Awarded to Marissa Holmbeck 9/2011 – 8/2014, ~\$95,000

"Chastity in a Sexual World: The making of an unselfish genome" NSF Doctoral Dissertation Improvement Grant awardee Bruce Bryan, 5/07 – 4/09, \$12,000.

"*Drosophila* energetics and mitonuclear function" NIH NRSA Kristi Montooth awardee, D. Rand PI, 3/1/06 – 2/28/09, \$132,000

"The evolution of gene expression in *Drosophila*" NIH NRSA, Colin Meiklejohn awardee, D. Rand PI, 1/1/05 – 12/31/08, \$132,000

"Population connectivity and the origins of genetic diversity in the Mummichog, *Fundulus heteroclitis*, NOAA-NERR Grant to Robert Haney, 07/04-06/06, \$40,000

"From Parasite to Mutualist: *Wolbachia* in *Drosophila*" NSF Dissertation Improvement Grant to Adam Fry, 5/01/01 – 4/30/02, \$5840.

"The Mechanism of Selection at the MPI polymorphism in the Northern Acorn Barnacle" NSF Dissertation Improvement Grant to Paul R. Schmidt, 6/1/98 - 5/31/99, \$5720.

"The Evolutionary Impact of Natural Selection, Quantitative Genetic Variation, and Gene Flow in a Salt Marsh Perennial, *Limonium carolineanum*. NSF Population Biology, Dissertation Improvement Grant for Matthew B. Hamilton, with Johanna Schmitt, 7/92 - 6/95, \$12,000

GRANT PROPOSALS PENDING / SUBMITTED

- "COBRE Center for Computational Biology of Human Disease" NIGMS 1P20GM121313-01, \$12,040,619, David Rand, PI (submitted 2/2014 and 2/2016)
- "Nuclear-Mitochondrial Fitness Interactions in *Drosophila*", NIH General Medicine, 2R01GM067862-13, \$1,351,682, 12/1/16-11/30/20, Dr. David Rand, PI. Dr. Zhijin Wu, co-I. (submitted 3/2016)
- "Mitochondrial Genetics of Aging in *Drosophila*", NIH National Institute on Aging, 2R01AG027849, \$1,950,443, 04/01/16– 3/31/2021, Dr. David Rand, PI. (submitted 7/2015)
- "Mitonuclear genomics of environmental exposure to silver nanoparticles in *Drosophila*", National Institutes of Environmental Health Science, R01 submitted, 10/2015 (submitted 2/2016)
- "Computational Biology of Human Disease", NIH Centers of Biomedical Research Excellence program, NIGMS, submitted 2/2014 (still pending); new application submitted 1/2016

PUBLICATIONS IN JOURNALS (undergraduate Co-Authors are underlined)

1. **Rand, D. M.** and G. V. Lauder, Jr. 1981. Prey capture in the chain pickerel (*Esox niger*): correlations between feeding and locomotor behavior. *Can. J. Zool.* 59:1072-1078.
2. Harrison, R.G., **D. M. Rand** and W. C. Wheeler. 1985. Mitochondrial DNA size variation within individual crickets. *Science* 228:1446-1448.
3. **Rand, D. M.** and R. G. Harrison. 1986. Mitochondrial DNA transmission genetics in crickets. *Genetics* 114:955-970.
4. Harrison, R. G., **D. M. Rand** and W. C. Wheeler. 1987. Mitochondrial DNA variation across a narrow hybrid zone. *Mol. Biol. Evol.* 4(2):144-158.
5. **Rand, D. M.** and R. G. Harrison. 1989. Molecular population genetics of mtDNA size variation in crickets. *Genetics* 121:551-569.
6. **Rand, D. M.** and R. G. Harrison. 1989. Ecological genetics of a mosaic hybrid zone: Mitochondrial, nuclear and reproductive differentiation of crickets by soil type. *Evolution* 43:432-449.
7. Arnason, E. and **D. M. Rand**. 1992. Heteroplasmy of short tandem repeats in the mitochondrial DNA of Atlantic cod, *Gadus morhua*. *Genetics* 132:211-220.
8. **Rand, D. M.** 1992. A dot blot hybridization method for estimating the frequencies of mitochondrial DNA haplotypes in experimental populations of *Drosophila*. *Drosophila Information Service* 71:176-180.
9. **Rand, D. M.** 1992. RIPping and RAPping at Berkeley. *Genetics* 132:1223-1224
10. **Rand, D. M.** 1993. Endotherms, ectotherms and mitochondrial genome-size variation. *Journal of Molecular Evolution* 37:281-295.
11. **Rand, D. M.** 1994. Thermal habit, metabolic rate and the evolution of

- mitochondrial DNA. Trends in Ecology and Evolution 9: 125-131 (cover article)
12. **Rand, D. M. 1994.** Concerted evolution and RAPping in mitochondrial VNTRs and the molecular geography of cricket populations. pp. 227-245 In: *Molecular Ecology and Evolution: Approaches and Applications*, B Schierwater, B. Streit, G. Wagner and R. DeSalle, Eds., Birkhauser Verlag
 13. **Rand, D. M., M. L. Dorfsman** and L. M. Kann 1994 Neutral and non-neutral evolution of *Drosophila* mitochondrial DNA. Genetics 138: 741-756
 14. **Hutter, C. M.** and **D. M. Rand**, 1995 Competition between mitochondrial haplotypes in distinct nuclear genetic environments: *Drosophila pseudoobscura* versus *D. persimilis*. Genetics 140: 537-548.
 15. Kilpatrick, S. R. and **D. M. Rand**, 1995 Conditional hitchhiking of mitochondrial DNA: frequency shifts of *Drosophila melanogaster* mtDNA variants depend on nuclear genetic background. Genetics 141:1113-1124
 16. **Rand, D. M.**, 1996 Neutrality tests of molecular markers and the connection between DNA polymorphism, demography, and conservation biology. Conservation Biology 10: 665-671.
 17. **Rand, D. M.** and L. M. Kann, 1996 Excess amino acid polymorphism in mitochondrial DNA: contrasts among genes from *Drosophila*, mice, and humans. Molecular Biology and Evolution 13(6):735-748.
 18. Hamilton, M. B. and **D. M. Rand.**, 1996 Relatedness estimated by oligonucleotide probe DNA fingerprints and the mating system of Sea Lavender (*Limonium carolineanum*). Theoretical and Applied Genetics 93: 249-256
 19. Datta, S., **M. Kiparsky**, **D. M. Rand**, and J. Arnold. 1996. A statistical test of a neutral model using the dynamics of cytonuclear disequilibria. Genetics 144:1985-1992
 20. **Rand, D. M.** and L. M. Kann. 1998. Mutation and selection at silent and replacement sites in the evolution of animal mitochondrial DNA. Genetica 102/103: 393-407
 21. Kann, L. M., **E. R. Rosenblum**, and **D. M. Rand**. 1998. Aging, mating, and the evolution of heteroplasmy for mtDNA length variants in *Drosophila melanogaster*. Proc. Natl. Acad. Sci. 95:2372-2377
 22. Boussy, I. A., I. Masanobu, **D. Rand**, and R. C. Woodruff. 1998. Decay of the eastern Australian latitudinal cline of *P* element-associated properties in *Drosophila melanogaster* populations, and a test of the cline's origins. Genetica 140:45-57
 23. Schmidt, P. S. and **D. M. Rand**. 1999. Intertidal microhabitat and selection at MPI: Interlocus contrasts in the northern acorn barnacle. Evolution 53:135-146.
 24. Schmidt, P. S. M. D. Bertness, and **D. M Rand** 2000. Environmental

- heterogeneity and balancing selection in the northern acorn barnacle. Proc. Roy. Soc. London, B 267:379-384.
25. Weinreich, D. M. and **D. M. Rand**, 2000 Contrasting patterns of non-neutral evolution in proteins encoded in nuclear and mitochondrial genomes. Genetics 2000 156: 385-399.
 26. **Rand, D. M.**, D. M. Weinreich, and B. O Cezairliyan. 2000. Neutrality tests of conservative and radical amino acid changes in nuclear- and mitochondrially-encoded proteins. Gene 291:115-125.
 27. Brown, A. F. L. M. Kann and **D. M. Rand**, 2001. Gene flow versus local adaptation in the Northern acorn barnacle, *Semibalanus balanoides*: insights from mtDNA control regions polymorphisms. Evolution 55: 1972–1979.
 28. **Rand, D. M.** 2001. Mitochondrial genomics flies high. Trends in Ecology and Evolution 16:2-4
 29. **Rand, D. M.** 2001. The units of selection on mitochondrial DNA. Annual Review of Ecology and Systematics 32: 415-448.
 30. **Rand, D. M.**, A. G. Clark, and L. M. Kann 2001. Sexually antagonistic cytonuclear fitness interactions in *Drosophila melanogaster*. Genetics 2001 159: 173-187.
 31. Schmidt, P. S., and **D. M. Rand**. 2001 Adaptive maintenance of genetic polymorphism in an intertidal barnacle: Habitat and life history stage-specific survivorship of Mpi genotypes. Evolution 55(7):1336-44.
 32. Tatar, M. and **D. M. Rand**. 2002. Aging: Dietary advice on Q. Science 295:54-55.
 33. Fry, A. F. and **D. M. Rand**. 2002. Wolbachia interactions that determine *Drosophila melanogaster* survival. Evolution 56(10): :1976-81
 34. **Rand, D. M.**, Spaeth, P. S., Sackton, T., Schmidt, P. S. 2002. Ecological genetics of the Mpi and Gpi polymorphisms in the northern acorn barnacle and the spatial scale of neutral and non-neutral variation. Integrative and Comparative Biology 42:825-836.
 35. Kingan, S. B., M. Tatar, and **D. M. Rand**. 2003. Reduced Polymorphism in the Chimpanzee Semen Coagulating Protein, Semenogelin I. J. Mol. Evol. 57:159-169.
 36. Sackton, T. B., R. Haney, and **D. M. Rand**. 2003. Cytonuclear coadaptation in *Drosophila*: Disruptions of cytochrome c oxidase activity in backcross genotypes. Evolution 57:2315-2325
 37. Sheldahl, L. S., D. M. Weinreich, and **D. M. Rand**. 2003. Recombination, dominance and selection on amino acid polymorphisms in the *Drosophila* genome. Genetics 165: 1195-1208.

38. Townsend, J. P and D. M. Rand. 2004. Mitochondrial genome size variation in New World and Old World populations of *Drosophila melanogaster*. *Heredity*, 93(1):98-103
39. Fry, A.F., M. R. Palmer, and **D. M. Rand**. 2004. Variable fitness effects of Wolbachia infection in *Drosophila melanogaster*. *Heredity* 93(4):379-389.
40. Comegys, M. M., S.-H. Lin, **D. M. Rand**, D. E. Britt, D. L. Flanagan, H. M. Callanan, K. Brilliant, D. C. Hixson, 2004 Two variable regions in carcinoembryonic antigen-related cell adhesion molecule1 N-terminal domains located in or next to monoclonal antibody and adhesion epitopes show evidence of recombination in rat but not in human. *Journal of Biological Chemistry* 279(33):35063-78
41. **Rand, D. M.**, R. A. Haney, A. J. Fry. 2004. Cytonuclear coevolution: the genomics of cooperation. *Trends in Ecology and Evolution*, 19(12):645-653
42. Ballard. J. W. O. and **D. M. Rand**. 2005. The population biology mitochondrial DNA and its phylogenetic implications. *Annual Review of Ecology, Evolution and Systematics* 36:621-642.
43. **Rand, D.M.** 2005. Mitochondrial genetics of aging: Inter-genomic conflict resolution. *Science* Vol. 2005, Issue 45, *Sci. Aging Knowl. Environ.*, [DOI:10.1126/sageke.2005.45.re5].
44. **Rand, D. M.**, A. J. Fry, and L. A. Sheldahl. 2006. Nuclear-mitochondrial epistasis and *Drosophila* aging: Introgression of *D. simulans* mtDNA alters longevity in *D. melanogaster* nuclear backgrounds. *Genetics* 172: (1):329-41
45. Sanford, E., S. B. Holzman, R. A. Haney, **D. M. Rand**, M. D. Bertness. 2006. Thermal Tolerance of Larvae Regulates the Northern Geographic Range Limit of Fiddler Crabs. *Ecology* 87(11): 2882-2894.
46. Folk, D. A., P. Zwollo, **D. M. Rand**, G. W. Gilchrist. 2006. Selection for knockdown performance in *Drosophila melanogaster* impacts thermotolerance and heatshock response differentially in males and females. *Journal of Experimental Biology* 209(Pt 20):3964-73.
47. Haney, R. A. B. R. Silliman, A. J. Fry, C. Layman and **D. M. Rand**. 2007. The Pleistocene history of the sheepshead minnow (*Cyprinodon variegatus*): Non-equilibrium evolutionary dynamics within a diversifying species complex. *Molecular Phylogenetics and Evolution* 43(3):743-54
48. Haney, R.A., B. R. Silliman and **D. M. Rand**. 2007. A multi-locus assessment of gene flow and historical demography in the bluehead wrasse (*Thalassoma bifasciatum*). *Heredity* 98(5):294-302
49. Meiklejohn, C. D., Montooth, K, L. and **D. M. Rand**. 2007. Positive and negative selection on the mitochondrial genome. *Trends in Genetics* 23(6):259-63.
50. *Drosophila* Comparative Genomics Sequencing and Analysis Consortium (141

- authors including Montooth, K. L., Abt, D., **D. M. Rand**). 2007. Evolution of genes and genomes in the context of the *Drosophila* phylogeny. *Nature*, 450(7167):203-18.
51. **Rand, D. M.** 2008. Mitigating mutational meltdown in mammalian mitochondria. *PLoS Biology* 19;6(2):e35 doi:10.1371/journal.pbio.0060035
 52. Montooth, K, L. and **D. M. Rand**. 2008. The spectrum of mitochondrial mutations differs across species. *PLoS Biology* 6(8): e213 doi:10.1371/journal.pbio.0060213
 53. Schmidt, P.S., Serrão, E. A., Pearson, G. A., Riginos, C. Rawson, P.D., Hilbish, T. J., Brawley, S.H. Trussell, G.C. Carrington, E. Wetthey, D.S. Grahame, J.W., Bonhomme, F. and **D.M. Rand**. 2008. Ecological genetics in the north Atlantic: environmental gradients and adaptation at specific loci. *Ecology*: 89(11):S91-S107. doi: 10.1890/07-1162.1
 54. Haney, R. A., Dionne, M. Puritz, J. and **Rand, D. M.** 2009. The comparative phylogeography of east coast estuarine fishes in formerly glaciated sites: persistence versus recolonization in *Cyprinodon variegatus ovinus* and *Fundulus heteroclitus macrolepidotus*. *Journal of Heredity* 100(3):284-96. PMID: 19091690
 55. Rand, D. M. 2009. Why genomes in pieces? revisited: Sucking lice do their own thing in mtDNA circle game. *Genome Research* 19:700-702.
 56. Montooth, K. L., Abt, D., Hofmann, J, and **D. M. Rand**. 2009. Comparative genomics of *Drosophila* mtDNA: variation in evolutionary rates across regulatory elements, oxidative phosphorylation complexes and lineages. *Journal of Molecular Evolution* 69(1):94-114.
 57. Liu, X., Vinson, D., Abt, D., Hurt, R, and **D. M. Rand**. 2009. Differential toxicity of carbon nanomaterials in *Drosophila*: Larval dietary uptake is benign but adult exposure causes locomotor impairment and mortality. *Environmental Science and Technology*, 43(16): 6357–6363.
 58. Haney, R. A., Turner, B. J. and **Rand, D. M.** 2009. A cryptic lineage within the pupfish *Cyprinodon dearborni* suggests multiple colonizations of South America. *Journal of Fish Biology* 75: 1108-1114.
 59. Flight, P. A., Schoepfer, S., and **D. M. Rand**. 2010. Physiological stress and the fitness effects of *Mpi* genotypes in the acorn barnacle *Semibalanus balanoides*. *Marine Ecology Progress Series* 404: 139-149.
 60. Mahapatra, C., Bond, J., **Rand, D. M.**, M. D. Rand. 2010. Identification of Methylmercury Tolerance Genes in *Drosophila*. *Toxicological Sciences Sci.* 2010 Jul;116(1):225-38.
 61. **Rand, D.M.**, D. M. Weinreich, Lerman, D., Folk, D. A., G. W. Gilchrist. 2010. Three selections are better than one: Clinal variation of thermal QTL from independent selection experiments in *Drosophila*. *Evolution* 64(10):2921-34. doi: 10.1111/j.1558-5646.2010.01039.x.

62. Montooth, K. L., Meiklejohn, C. D., Abt, D. N., and **D. M. Rand**. 2010. Mitochondrial-nuclear epistasis affects fitness within species but does not contribute to incompatibilities between species in *Drosophila*. *Evolution* 64(12):3364-79. doi: 10.1111/j.1558-5646.2010.01077.x.
63. Haney, R.A., B. R. Silliman and **D. M. Rand**. 2010. Effects of selection and mutation on mitochondrial variation and inferences of historical population expansion in a Caribbean reef fish, *Molecular Phylogenetics and Evolution* 57: 821–828. doi:10.1016/j.ympev.2010.07.014
64. Gorth, D.J., **Rand D.M.**, Webster TJ . 2011. Silver nanoparticle toxicity in *Drosophila*: size does matter. *Int J Nanomedicine*. 20116:343-50. doi: 10.2147/IJN.S16881. PMID: PMC3044187.
65. **Rand, D. M.** 2011. Mitochondrial genome size, population genetics of the germline cytoplasm and the units of selection on *Drosophila* mtDNA. *Genetica* 139(5):685-97.
66. Flight, P.A., D. Nacci, D. Champlin, A. Whitehead, **D. M. Rand**. 2011. The effects of mitochondrial genotype on hypoxic survival and gene expression in a hybrid population of the killifish, *Fundulus heteroclitus*. *Molecular Ecology* 20:4503–4520. doi: 10.1111/j.1365-294X.2011.05290.x
67. Flight P.A., O'Brien, M., Schmidt, P.S., **D. M. Rand**. 2012. Genetic structure and the North American postglacial expansion of the barnacle, *Semibalanus balanoides*. *J of Heredity* 103(2):153-65 doi: 10.1093/jhered/esr083
68. Pesole, G., J. F. Allen, N. Lane, W. Martin, **D. M. Rand**, G. Schatz and C. Saccone. 2012. The neglected genome. *EMBO Reports* 13(6):473-4. doi:10.1038/embor.2012.57.
69. Flight, P.A. and **D. M. Rand**. 2012. Genetic variation in the acorn barnacle from allozymes to population genomics. *Integrative and Comparative Biology* 52(3):418-29. doi:10.1093/icb/ics099.
70. Zhu, C. T. and **D. M. Rand**. 2012. A hydrazine coupled cycling assay validates the decrease in redox ratio under starvation in *Drosophila*. *PLoS ONE* 7(10): e47584. doi:10.1371/journal.pone.0047584
71. Meiklejohn, C. D., Holmbeck, M. A., Siddiq, M. A., Abt, D. A., **Rand, D. M.**, and K. L. Montooth. 2013. An incompatibility between a mitochondrial tRNA and its nuclear tRNA synthetase compromises development and fitness in *Drosophila*. *PLoS Genet*. 2013 Jan;9(1):e1003238. doi: 10.1371/journal.pgen.1003238. [Highlight in Faculty of 1000: http://f1000.com/prime/717976643](http://f1000.com/prime/717976643)
72. Parmakelis A., Kotsakiozi P., **Rand D. M.** 2013. Animal mitochondria, positive selection and cyto-nuclear coevolution: insights from pulmonates. *PLoS One* 8(4):e61970. doi: 10.1371/journal.pone.0061970.

73. Villa-Cuesta, E., M. A. Holmbeck and **D. M. Rand**. 2014. Rapamycin increases mitochondrial efficiency by mtDNA-dependent reprogramming of mitochondrial metabolism in *Drosophila*. *Journal of Cell Science* 127(Pt 10):2282-90. doi: 10.1242/jcs.142026. **Highlight in Faculty of 1000:** <http://f1000.com/prime/718304674>
74. Zhu, C.-T., Ingelmo, P., and **D. M. Rand**. 2014. GxGxE for longevity in *Drosophila*: Mitochondrial, nuclear and dietary interactions that modify lifespan. *PLoS Genetics* 10(5):e1004354. doi: 10.1371/journal.pgen.1004354. **Highlight in Faculty of 1000:** <http://f1000.com/prime/718389150>
75. Villa-Cuesta, E., F. Fan and **D. M. Rand**. 2014. Rapamycin reduces *Drosophila* longevity under low nutrition. *IOSR Journal Of Pharmacy* Volume 4, Issue 8 (August 2014), PP. 43-51. doi:10.9790/3013-0408043051
76. Holmbeck M.A. and **Rand D.M.** 2015. Dietary Fatty Acids and Temperature Modulate Mitochondrial Function and Longevity in *Drosophila*. *J Gerontol A Biol Sci Med Sci*. 2015 Apr 23. pii: glv044. [Epub ahead of print] PMID: 25910846.
77. Holmbeck, M.A., Donner, J.R., Villa-Cuesta E., **Rand D.M.** 2015. A *Drosophila* model for mito-nuclear diseases generated by an incompatible tRNA-tRNA synthetase interaction. *Disease Models and Mechanisms* 8(8):843-54. doi: 10.1242/dmm.019323. PMID: 26035388
78. Villa-Cuesta, E. and Rand, D.M. 2015. Preparation of mitochondrial enriched fractions for metabolic analysis in *Drosophila*. *Journal of Visualized Experiments* Sep 30;(104). doi: 10.3791/53149
79. Graves, C.J., Makrides, E., V.T. Schmidt, Giblin, A.E., Cardon, Z.G., **D.M. Rand**. 2016. Functional responses of salt marsh microbial communities to long-term nutrient enrichment. *Applied Environmental Microbiology* 82(9):2862-71.
80. Mossman, J.A., Biancani, L. Zhu, C.-T. and **D.M. Rand**. 2016. Mitonuclear epistasis for development time and its modification by diet in *Drosophila*. *Genetics* 203(1): 463-484.
81. Howard, D.J., Grosberg R.K., Noor M.A., Normark, B.B., Rand, D.M., Shaw, K.L., Willett, C.S. 2017. In memoriam: Richard G. Harrison - his life and legacy.. *Molecular Ecology* 25(11):2333-6. doi: 10.1111/mec.13687.
82. Mossman, J.A., Tross J.G., Li N., Wu Z., and **D.M. Rand**. 2016. Mitochondrial-Nuclear Interactions Mediate Sex-Specific Transcriptional Profiles in *Drosophila*. *Genetics* 204(2):613-630.
83. Mossman, J.A., Tross J.G., Jourjine N.A., Li N., Wu Z., and **D.M. Rand**. 2017. Mitonuclear interactions mediate transcriptional responses to hypoxia in *Drosophila*. *Molecular Biology and Evolution* 34(2):447-466. doi: 10.1093/molbev/msw246
84. Rand DM. 2017. Fishing for adaptive epistasis using mitonuclear interactions. *PLoS Genet*. 2017 Mar 31;13(3):e1006662. doi: 10.1371/journal.pgen.

Manuscripts Submitted

Sujkowski, A., Rajagopalan, T., Safdar, M., Imsirovic, D., Arking, R., Spierer, A., Rand, D.M., and R.J. Wessells. Mito-nuclear interactions modify *Drosophila* exercise performance. *Genes Genomes Genetics*. Submitted 2/2018.

Nunez, J.C.B., Biancani, L.M., Flight, P.A., Nacci, D.E., **Rand, D.M.**, Crawford, D.L., and Oleksiak, M.F., 2016 Stable genetic structure and high migration rates in populations of *Fundulus heteroclitus* adapted to pollutants. *Royal Society Open Science*, submitted 7/2017.

Mossman, J.A., Mabeza, R.M, Blake, E., Mehta, N. and **D. M. Rand**. Trans-generational effects of parental age on offspring fertility in *Drosophila melanogaster*. submitted to *Proceedings of the Royal Society*, in revision.

Mossman J.A., Ge Y., Navarro F. and **D. M. Rand**. Mitochondrial DNA fitness depends on nuclear genetic background in *Drosophila*, submitted to *Genetics*, in revision.

Flight, P.A. and **D. M. Rand**. submitted. DNA sequence analysis of a classic allozyme polymorphism: *Mpi* in *Semibalanus balanoides*. *Evolution*, in revision.

Manuscript drafts:

D. M. Rand, Cezairliyan, B. O., Alehegn, Z. and Hofmann, J. W. The human mitochondrial genome and proteome show distinct departures from neutral evolution. *Molecular Biology and Evolution*, in revision.

Wagaman, R., Hofmann, J. and **D. M. Rand**. Mitochondrial genotype modulates longevity extension by dietary restriction in *Drosophila*. *Aging Cell*, in revision

Wagaman, R, Hofmann, J. and **D. M. Rand**. *Chico* rescues mitochondrial defects on *Drosophila* longevity and fecundity. To be submitted to *Aging Cell*.

Weinreich, D. M. L. M. Kann, and **D. M. Rand**. Selection against a Zimbabwe genome in experimental populations of *Drosophila melanogaster*: analysis of multilocus microsatellite markers. To be submitted to *Genetics*.

D. M. Rand, L. M. Kann, M. Kiparsky, M. Siegal, P. S. Schmidt, and S. Datta. Evolution of cytonuclear genotypes in experimental populations of *Drosophila melanogaster*. To be submitted to *Journal of Heredity*.

BOOK CHAPTERS

Harrison, R. G. and **D. M. Rand**. 1989. Mosaic hybrid zones and the nature of species boundaries. In: *Speciation and its Consequences*, edited by D. Otte and J. Endler, Sinauer Associates, Sunderland, Mass.

Zouros, E. and **D. M. Rand**. 1999. Population genetics and evolution of animal mitochondrial DNA. Chapter 23 in *Evolutionary Genetics from Molecules to Morphology*, R. Singh and C. Krimbas, Eds. Cambridge University Press.

THESES AND MONOGRAPHS

Rand, D. M. 1980. Prey Capture in the Chain Pickerel, (*Esox niger*). Undergraduate Honors Thesis, Harvard University, June 1980.

Rand, D. M. and R. A. Paynter, Jr. 1981. Ornithological Gazetteer of Uruguay. Museum of Comparative Zoology, Harvard University, iv + 75 pp.

Rand, D. M. 1987. Population Biology of Mitochondrial DNA in the Crickets *Gryllus pennsylvanicus* and *Gryllus firmus*. Ph. D. Thesis, Yale University, September 1987.

Abstracts and papers presented at national and international meetings: (from Brown)

Rand, D. M. 1992. Endothermy, heteroplasmy and mitochondrial DNA size variation. International Conference of Molecular Evolution, Pennsylvania State University, State College, PA.

Rand, D. M. 1992. RIPPING and RAPPING in mtDNA and the fine structure of cricket populations in southern New England, Society for the Study of Evolution/American Society of Naturalists/Society of Systematic Biologists, Annual Meeting, Berkeley CA, June 17-21, 1992

Rand, D. M. 1993. Is mitochondrial DNA variation neutral? Tests with population cages and nucleotide sequences. Annual Drosophila Research Conference, San Diego, CA, March 13-April 4

Rand, D. M. 1993. Is mitochondrial DNA variation neutral? Tests with population cages and nucleotide sequences Annual Meeting, Society for the Study of Evolution/American Society of Naturalists/Society of Systematic Biologists, Snowbird UT, June 19-23, 1993

Rand, D. M. 1994. Non-neutral evolution of mitochondrial DNA: Evidence from cytonuclear competition experiments and nucleotide sequences. Annual Drosophila Research Conference, Chicago, IL, April 20-24

Rand D. M. 1994 Non-neutral evolution of mitochondrial DNA: Evidence from cytonuclear competition experiments and nucleotide sequences. Annual Meeting, Society for the Study of Evolution/American Society of Naturalists/Society of Systematic Biologists, Athens, GA, June 15-19, 1994

Rand, D. M., M. Kiparsky 1995. Evolution of cytonuclear genotypes in experimental populations of *Drosophila melanogaster* Annual Meeting, Society for the Study of Evolution / American Society of Naturalists / Society of Systematic Biologists, Montreal, Canada July 8-12, 1995.

Rand, D. M. and Lisa M. Kann. 1995. Non-neutral evolution of codon usage and excess amino acid polymorphism in *Drosophila* mtDNA. Annual Meeting, Society for the

Study of Evolution / American Society of Naturalists / Society of Systematic Biologists, Montreal, Canada July 8-12, 1995

- Rand D. M. and L. M. Kann. 1996. Are departures from neutrality strand-specific in *Drosophila* mitochondrial DNA? National Drosophila Research Conference, San Diego CA, May 1996
- Rand, D. M. and A. May. 1996. With whom should an endangered population hybridize? An experimental study with *Drosophila*, Ecological Society of America/American Society of Naturalists/Society of Conservation Biologists Meetings, Providence, RI August 1996
- Rand, D. M. and L. M. Kann. 1997. Near-neutrality or relaxed selection? Neutrality tests of amino acid polymorphism in commensal and non-commensal species; Annual Meetings of Society for the study of Evolution/American Society of Naturalists/Society of Systematic Biologists, Boulder Colorado June 1997
- L. M. Kann and D. M. Rand. 1997. A strand-bias to non-neutral mitochondrial DNA evolution: Evidence from the CytB and ND5 genes in *Drosophila*; Annual Meetings of Society for the study of Evolution/American Society of Naturalists/Society of Systematic Biologists, Boulder Colorado June 1997
- P. R. Schmidt and D. M. Rand. 1997. Balancing selection at the MPI locus in *Semibalanus balanoides*. Annual Meetings of the Society for the study of Evolution/American Society of Naturalists/Society of Systematic Biologists, Boulder Colorado June 1997
- Rand, D. M. and P. R. Schmidt. 1998. Group sex in the acorn barnacle: paternity analyses using microsatellite markers. Benthic Ecology Meetings, Melbourne Florida, 12-15 March 1998.
- Rand, D. M., and L. M. Kann. 1998. Sex chromosome - cytoplasm fitness interaction in *Drosophila*. Annual Meeting, Society for the Study of Evolution / American Society of Naturalists / Society of Systematic Biologists, Vancouver, BC, June 1998.
- Rand, D. M. 1999. Departures from Neutrality are different for nuclear and mitochondrial genes. 40th Annual Drosophila Research Conference, Seattle WA, 24-28 March 1999
- Rand, D.M. and D. M. Weinreich. 1999. Neutrality, selection and the evolution of protein-coding DNA: the importance of the distribution of selection coefficients. VIIth European Society of Evolutionary Biology Congress, Barcelona, Spain, Aug 1999
- Rand, D.M., D.M. Weinreich, and L. M. Kann. 2000 Selection against a Zimbabwe genome in experimental populations of *Drosophila melanogaster*. 41st Annual Drosophila Research Conference, Pittsburgh, PA, 22-26 March;
- Rand, D.M., A.J. Fry, and L. DiChiaro. 2000. Experimental evolution of the G-matrix: changes in wing shape between hot- and cold-selected populations of *D. melanogaster*. Annual Meetings of the Society for the Study of Evolution /

American Society of Naturalists / Society of Systematic Biologists, Bloomington Indiana, June 2000.

- Rand, D.M., D. M. Weinreich, G. Gilchrist, R. Huey 2001. Genomics of thermal selection in experimental populations of *Drosophila melanogaster*. Annual Meetings of the Society for the Study of Evolution / American Society of Naturalists / Society of Systematic Biologists, Knoxville Tennessee, June 2001.
- Rand, D.M., D. M. Weinreich, G. Gilchrist, R. Huey 2001. Large X-chromosome effect in response to thermal selection in experimental populations of *Drosophila melanogaster* 42nd Annual Drosophila Research Conference, Washington, D.C., March 2001.
- Rand, D. M., Spaeth, P. S., Sackton, T., Schmidt, P. S. 2002. Ecological genetics of the *Mpi* and *Gpi* polymorphisms in the northern acorn barnacle and the spatial scale of neutral and non-neutral variation. Society for Integrative and Comparative Biology, Anaheim, CA, Jan.2002
- Rand, D.M, R.Haney, T. B. Sackton, and L. S. Sheldahl, 2003. Cytonuclear coevolution: fitness consequences of mtDNA introgression from *D. simulans* to *D. melanogaster*. Annual Meetings of the Society for the Study of Evolution / American Society of Naturalists / Society of Systematic Biologists, Chico, California, June 2003.
- Rand, D. M, B. O Cezairliyan, 2004. Human mitochondrial genome and proteome show opposing departures from neutral evolution. Genomes and Evolution, Annual Meeting of the Society of Molecular Biology and Evolution, Penn State University, June 2004.
- Rand, D. M. M. Palmer, D. M. Weinreich, G. C. Gilchrist. 2004 Clinal analysis of a thermal QTL. Annual Meeting of the Society for the Study of Evolution / American Society of Naturalists / Society of Systematic Biologists, Fort Collins, CO, June 2004.
- Rand, D.M., R. Haney, J. Kanefsky, R. Wagaman, L. Nicolaides, 2005. Evolution of nuclear mitochondrial interactions in *Drosophila*. 46th Drosophila Research Conference, San Diego, CA, March 2005
- Rand, DM, C. Meiklejohn, D. Folk, G. Gilchrist. 2005. Clinal analysis of a thermal QTL in *Drosophila*. Annual Meeting of the Society for the Study of Evolution / American Society of Naturalists / Society of Systematic Biologists, Fairbanks, Alaska June 2005
- Rand, DM, C. Meiklejohn, D. Folk, R. Hopkins, D. Solomon, G. Gilchrist. 2006. Population genetic analyses of a thermal QTL in natural and experimental populations of *Drosophila melanogaster*, 47th Drosophila Research Conference, Houston, TX, March 2006
- Rand, D. M., Wagaman, R, Hofmann, J. W. Mitochondrial genotype alters longevity in *Drosophila*. Annual Meeting of the Society for the Study of Evolution / American Society of Naturalists / Society of Systematic Biologists, Stony Brook, NY, June

2006

- Rand, D. M. Wagaman, R, Hofmann, J. W. *chico* rescues mitochondrial defects in *Drosophila* longevity extension under dietary restriction. 48th *Drosophila* Research Conference, Philadelphia, PA, March 2007
- Rand, D.M. Meiklejohn, C. D., Folk, D., Gilchrist, G. Transcriptional profiles of high and low selection lines for the temperature knock down phenotype in *Drosophila melanogaster*. 48th *Drosophila* Research Conference, Philadelphia, PA, March 2007
- Rand, D. M. K. L. Montooth, C. D. Meiklejohn., D. Abt. Mito-nuclear genotypes effects on climbing behavior in *Drosophila*. American Genetic Association Symposium, Raleigh, NC. June 2008
- Rand, D. M., S. Le, N. Jourjine, K. L. Montooth, C. D. Meiklejohn. Mito-nuclear epistasis for desiccation, locomotor and thermal traits in *Drosophila*. 50th *Drosophila* Research Conference, Chicago, IL, March 2009
- Rand, D. M., Rubinstein, M., Montooth, K. L., Meiklejohn, C. D., Abt, D. Mating modifies longevity extension by diet restriction and mediates a mito-nuclear epistasis for life history traits. 50th *Drosophila* Research Conference, Chicago, IL, March 2009
- Rand, D. M. Montooth, K. L., Meiklejohn, C. D. Feeling positive about negative selection: purging mutations from mitochondrial genomes. Society for Molecular Biology and Evolution, University of Iowa, June 2009
- Rand, D. M. Wagaman, R, Hofmann, J. W. *chico* rescues mitochondrial defects in *Drosophila* longevity extension under dietary restriction. 21st European *Drosophila* Research Conference, Nice, France, November 2009
- Rand, D. M., Montooth, K. L., Meiklejohn, C. D., Flight, P.A. Mito-Nuclear Epistasis as a case study of conflict and cooperation: an empirical approach in *Drosophila*. Society for Molecular Biology and Evolution, University Lyon, France, July 2010
- Rand, D. M., N. Jourjine, S. Le, M. Holmbeck, C. D. Meiklejohn, K. L. Montooth. Phenotypic McDonald-Kreitman tests of mitochondrial genotypes reveals neutral divergence and non-neutral polymorphism of life history traits. 52th *Drosophila* Research Conference, San Diego, CA, March 2011.
- Rand, D. M., P. A. Flight, N. Jourjine, S. Le, M. Holmbeck, C. D. Meiklejohn, K. L. Montooth. Phenotypic McDonald-Kreitman tests of mitochondrial genotypes reveals neutral divergence and non-neutral polymorphism of life history traits. Annual Meeting of the Society for the Study of Evolution / American Society of Naturalists / Society of Systematic Biologists, Norman, OK, June 2011.
- Rand, D. M., Patrick Flight, Nicolas Jourjine, Lei Zhu. Phenotypic McDonald-Kreitman tests of mitochondrial genotype effects on nuclear gene expression. 53th *Drosophila* Research Conference, Chicago, IL, March 2012 and Society for Molecular Biology and Evolution Meetings, Dublin Ireland, June 2012.

- Rand, D. M. Ge, Y. Flight, P.A., Jourjine, N., L. Zhu. Mitochondrial genotypes drive differential expression of nuclear genes under varied levels of hypoxia in *Drosophila*, 54th *Drosophila* Research Conference, Washington, DC, March 2013.
- Rand, D. M., Ge, Y., Wu, Z. Jourjine, N. Mitonuclear epistasis and the transcriptional response to hypoxia in *Drosophila*. Annual Meeting of the Society for the Study of Evolution / American Society of Naturalists / Society of Systematic Biologists, Snowbird, UT, June 2013.
- Rand, D. M., Ge, Y., Jourjine, N., Mossman, J. A. Mitonuclear epistasis and the transcriptional response to hypoxia in *Drosophila*. 55th *Drosophila* Research Conference, San Diego, CA March 2014.
- Rand, D. M. Colin Meiklejohn, Kristi Montooth, Patrick A. Flight, Marissa Holmbeck, Eugenia Villa-Cuesta, Jim Mossman, Lei Zhu, Nicholas Jourjine, Jenn Ge, Mitonuclear Epistasis and Coadaptation in *Drosophila* GxGxE: what it is and why it matters. Systems Genetics and Evolution of Non-Human Model Organisms, Ascona Switzerland, May 2014,
- Rand, D. M. Yawei Ge, Nicholas Jourine, Patrick Flight, Mitonuclear epistasis and coevolution mediate the differential expression of nuclear genes under varied levels of hypoxia in *Drosophila*, Annual Meeting of the Society for Molecular Biology and Evolution, San Juan Puerto Rico, June 2014.
- Rand, D. M., C.-T. Zhu, J. Mossman, J. Santiago, A. Spierer, L. Biancani, T. Devlin, J. Dewey, B. Franklin, M. McAteer, Z. Pataki, C. Hale-Phillips, C. Ye, D. Yoon, Mitonuclear AxGxE: Genetic and dietary interactions are as important as single factors in explaining *Drosophila* lifespan and healthspan. Cold Spring Harbor Meeting on the Biology of Aging, October 2014.
- Spierer, A., A. Pascal, R. M. Mabeza, D. M. Rand. Mitochondrial knockdown using tissue specific expression of mitochondrially-targeted restriction enzymes against mtDNA as a model for the decline in organismal performance. *Drosophila* Research Conference, Chicago IL, March 2015
- Mossman, J. A., Y. Ge, N. Li, Z. Wu & D. M. Rand, Mitochondrial - nuclear interactions mediate genotype-specific transcriptional responses to hypoxia in *Drosophila*. *Drosophila* Research Conference, Chicago IL, March 2015
- Mossman, J. A., L. Biancani, C.-T. Zhu, D. M. Rand, Mitochondrial x nuclear DNA epistases and environment modify fitness in the *Drosophila* Genetic Reference Panel (DGRP) *Drosophila* Research Conference, Chicago IL, March 2015
- Rand, D.M., J.A. Mossman, L.M. Biancani, C.-T. Zhu. Can epistasis or GxE be predictable? Lessons from mitonuclear interactions in *Drosophila*. The Allied Genetics Conference, Genetics Society of America, Orlando FL, July 2016
- Rand, D.M., J.A. Mossman, L.M. Biancani, C.-T. Zhu. Mitonuclear epistasis for fitness and gene expression in *Drosophila*: common features of GxG and GxE". Society for the Study of Evolution, Austin, TX, June 2016
- Rand, D.M., J.A. Mossman, L.M. Biancani, C.-T. Zhu. *Drosophila* models of mitonuclear

interactions in disease. Mitochondrial Medicine 2016. The United Mitochondrial Disease Foundation, Seattle Washington, June 2016

Rand, D.M., J.A. Mossman, L.M. Biancani, C.-T. Zhu. Mitonuclear transcriptomes show common features of epistasis (GxG) and gene-by-environment (GxE) interactions in *Drosophila*. Society for Molecular Biology and Evolution, Austin, TX, July 2017

Rand, D.M., J.A. Mossman, L.M. Biancani, C.-T. Zhu. Mitonuclear transcriptomes show common features of epistasis (GxG) and gene-by-environment (GxE) interactions in *Drosophila*. Gordon Conference on Ecological and Evolutionary Genomics, University of New England, July 2017

Nunez, J. C. B. Elyanow, R.G. Brown, B. R. P. and D. M. Rand. 2017. Ecological genomics of thermal adaptation: Genome wide screens in Acorn barnacles reveal multiple loci responding to thermal gradients at tidal microhabitats. Gordon Conference on Ecological and Evolutionary Genomics, University of New England, July 2017

Invited seminars

SUNY Stony Brook, October 1991. The units of selection on mitochondrial DNA
University of Rhode Island, The cytoplasm as a population and the evolution of mitochondrial DNA.

Yale University, 16 September 1994. "Non-neutral evolution of mitochondrial DNA: Evidence from cytonuclear competition experiments and nucleotide sequences."

Tufts University, 21 October 1994. "Thermal habit and the departures from neutral evolution in mitochondrial DNA"

University of Chicago, 5 December 1994. "Who said mtDNA is neutral? Insights from competition studies and nucleotide sequences."

University of Massachusetts, 31 March 1995. "Who said mtDNA is neutral? Insights from competition studies and nucleotide sequences."

Gordon Conference on Bioenergetics Proctor Academy 2-7 July 1995. "Metabolic Rate, Thermal habit and the evolution of mitochondrial DNA."

Rutgers University, 28 September 1995. "Who said mtDNA is neutral? Insights from cytonuclear competition experiments and nucleotide sequences."

University of Georgia, 25 October 1995. "Who said mtDNA is neutral? Insights from cytonuclear competition experiments and nucleotide sequence surveys."

University of New Hampshire, 31 March 1996. "Who said mtDNA is neutral? Insights from cytonuclear competition experiments and nucleotide sequence surveys."

National Zoological Park, Washington, D.C. 31 May 1996. "Neutrality and fitness tests of mitochondrial DNA with relevance for conservation biology: How to make fruit flies interesting."

Annual *Drosophila* Research Conference, Chicago, IL 4/16-4/20/97 Invited participant in the Workshop on Aging, "Aging, mating and the evolution of germline heteroplasmy for mitochondrial DNA length variants in *D. melanogaster*."

Cornell University, 2 February 1998. "Selection on mitochondrial DNA and on cytonuclear interactions"

University of Pennsylvania, January 21, 1999, "Searching for selection with molecular markers: finding it in flies and barnacles"

University of Arizona, May 3, 1999, "Detecting selection with interlocus contrasts: examples from flies and barnacles"

University of Chicago, May 17, 1999 "Detecting selection with interlocus contrasts: examples from flies and barnacles"

Boston University, Nov 8, 1999 "Detecting selection with interlocus contrasts: examples from flies and barnacles"

Stazione Zoologica Anton Dohrn, Workshop on Neutralism and Selectionism: End of the debate, Ischia, Italy May 3-7 2000. "Sexually antagonistic selection and cytonuclear fitness interactions"

New England Molecular Evolutionary Biologists, Oct 14, 2000, "Genomic approaches to natural selection: from lab rat to web wienie"

Gordon Conference on Quantitative Genetics and Genomics, Feb 19-23, 2001, "Genomic and Phenomic scans of thermal selection in experimental populations of *Drosophila melanogaster*"

Marine Biological Laboratories, Woods Hole, MA, Workshop on Molecular Evolution, July 29 – August 10, 2001 "Neutrality tests of DNA sequences" and "Detecting selection using inter-locus contrasts"

Society for Integrative and Comparative Biology; Symposium on Physiological ecology of rocky intertidal organisms: from molecules to ecosystems. Anaheim CA, Jan 2002. "Thermal selection at the *Mpi* locus in the Northern Acorn Barnacle"

Carnegie Institution, Dept of Embryology, Baltimore MD 4 Feb 2002. "The units of selection on mitochondrial DNA"

Duke University, Dept of Biology, 4 March 2002. "Experimental genomics of thermal selection: what can flies tell us about barnacles?"

Longevity Consortium, Annapolis MD., 14 July 2002. "Mitochondrial genetics of aging in *Drosophila*"

Marine Biological Laboratories, Woods Hole, MA, Workshop on Molecular Evolution, July 29 – August 10, 2001 "Neutrality tests of DNA sequences" and "Detecting selection using inter-locus contrasts"

University of Lausanne, Switzerland, "La Sage" Meeting on Sex-specific genetic markers, 4 September 2002. "The evolution of mtDNA: Neutrality, selection and sexual antagonism"

University of Bern, Switzerland "Selection on genes and genomes: neutrality tests *in vivo* and *in silico*" 31 March 2003

University of Konstanz, Germany "Functional Genomics of nuclear-mitochondrial interactions" 29 April 2003

University of Fribourg, Switzerland "Experimental Evolution in *Drosophila*: Selection on genes and genomes" 10 June 2003.

Harvard University, Cambridge, MA, "Mitochondrial mutations and fruitfly fitness", 16 October 2003

Tufts University, Medford, MA, "Mitochondrial mutations and fruitfly fitness" 30 Jan 2004

Marine Resources Center, MBL Woods Hole, MA "Ecological Genetics of the acorn barnacle" 5 Nov 2004

University of Maine, Orono, ME "Gene flow versus local adaptation in the acorn barnacle" 5 Nov 2004

University of Connecticut, Storrs, CT "Cytonuclear coevolution: fitness consequences of mitochondrial genome introgression in *Drosophila*" 6 Dec 2004

University of Colorado, Boulder CO "Cytonuclear coevolution: the genomics of cooperation" 25 Feb 2005

Marine Biological Laboratories, Woods Hole, MA "Nuclear-mitochondrial coevolution: conflict and cooperation in genomic interactions" 4 Aug 2005

Gordon Research Conference, Ventura, CA Session Chair, Molecular Evolution Conference: "Adaptive Evolution" 5-10 Feb 2006.

Gordon Research Conference on Molecular Evolution, elected Conference Co-Chair for 2008, Chair for 2010.

Yale University, New Haven CT "The mitochondrial mojo of fruitfly fitness" 18 Jan 2006

University of Massachusetts, Amherst MA, "The mitochondrial mojo of fruitfly fitness" 10 Apr 2006

University of Washington, Seattle, WA, "Mitochondrial genetics of aging in *Drosophila*" 23 May 2006

University of California, San Francisco, Longevity Consortium Program Project, "Mitochondrial genetics of aging in *Drosophila*" 10/2006.

University of Wyoming. "The mitochondrial mojo of fruitfly fitness" 11/2006.

University of California, Davis. "The mitochondrial mojo of fruitfly fitness" 11/2006.

Cornell University, Ithaca NY. "The mitochondrial mojo of fruitfly fitness" 3/2007

University of Washington, Symposium on Mitochondrial Evolution. "Mitonuclear coevolution, epistasis, and fitness. 6/2007

Gordon Conference on Evolutionary and Ecological Functional Genomics, Newport RI, "Mitonuclear coevolution, epistasis and organismal function. 7/2007

Uppsala University, Symposium on Cytonuclear Coevolution, "European Society for Evolutionary Biology, "Cytonuclear coevolution, epistasis and hybrid zones". 8/2007

Gordon Research Conference on Molecular Evolution, Ventura CA, 2/2008, Vice Chair 2008, Chair elect 2010

Ohio State University, "Mitonuclear coadaptation, epistasis, and fitness", 8 May 2008

Kansas State University, "Mitonuclear coevolution, thermal selection, and fitness: when your genes are just another part of the environment 10/2008

SUNY Stony Brook, "Running hot and cold about balancing selection: thermal selection in flies and barnacles", 12/2008

Villanova University, "Running hot and cold about balancing selection: thermal selection in flies and barnacles" 3/2009

Louisiana State University, "Mitonuclear coevolution, thermal selection, and fitness: when your genes are just another part of the environment 3/2009

Society for Molecular Biology and Evolution, Symposium on Mutation Accumulation in Eukaryotic Genomes, "Feeling positive about negative selection", 6/2009

Pennsylvania State University, "Mitonuclear coadaptation, epistasis and fitness: evolutionary genetics of mitochondrial disease in *Drosophila*"; Institute of Molecular Evolutionary Genetics, Penn State, "Running hot and cold about balancing selection: Thermal selection in flies and barnacles", 9/2009

University of North Carolina, Chapel Hill, "Mitonuclear coadaptation, thermal selection and fitness: when genes are just another part of the environment", 9/2009

University of Montpellier, France, Institute for the Study of Evolution, "Evolutionary Genetics of mitonuclear coadaptation, fitness and disease", 1/2010.

University of Cambridge, England, "Evolutionary genetics of mitonuclear cooperation, fitness and disease", 4/2010

University of Bari, Italy, "Evolutionary genetics of mitochondrial-nuclear cooperation, fitness and disease in *Drosophila*", 5/2010

University of Montpellier, Station Marin Environment Littoral, Sète, France, "Genetic variation in heterogenous environments: gene flow and selection at *Mpi* in *Semibalanus*", 6/2010

Cornell University, "The population genetics of the cytoplasm and the units of selection on mtDNA", 7/2010

Drosophila Research Conference, Population and Quantitative Genetics platform session, "Phenotypic McDonald-Kreitman tests of mitochondrial genotypes reveals neutral divergence and non-neutral polymorphism of life history traits", 3/2011.

National Heart, Lung and Blood Institute, Bethesda, MD, "Evolutionary genetics of mitochondrial fitness, aging and disease in Drosophila", 6/2011

Drosophila Research Conference, Physiology and Aging platform session, "Mitochondrial genotype alters the nuclear transcriptional response to varied levels of hypoxia in Drosophila", 3/2012

Cornell University, "Mitonuclear coadaptation, epistasis, and the genomics of cooperation", 2/2013

Canadian Society of Zoologist, Annual Meeting, Symposium on Animal Mitochondria: Evolution, Performance and Plasticity, University of Guelph, "Mitochondrial genotypes drive differential expression of nuclear genes under varied levels of hypoxia in Drosophila", 5/2013

University of British Columbia, "Evolutionary genetics of mitonuclear coadaptation in Drosophila", 4/2014

Annual Meeting of the Society for Molecular Biology and Evolution, "Mitonuclear epistasis and coevolution mediate the differential expression of nuclear genes under varied levels of hypoxia in Drosophila, 6/2014.

Cold Spring Harbor Meeting on the Biology of Aging, "Mitonuclear AxGxE: Genetic and dietary interactions are as important as single factors in explaining Drosophila lifespan and healthspan", 10/2014.

Drosophila Research Conference Mossman, J. A., L. Biancani, C.-T. Zhu, D. M. Rand, "Mitochondrial x nuclear DNA epistases and environment modify fitness in the Drosophila Genetic Reference Panel (DGRP)", 3/2015

Keystone Meeting in Mitochondrial Metabolism, "Mitonuclear genetic interactions in Drosophila fitness, aging and disease", Whistler, BC, 3/2015

Gordon Research Conference on Ecological and Evolutionary Genomics, "Introduction to Population Genomics, Adaptation, and Speciation", Session Chair, 6/2015

Translational Research in Mitochondria, Aging, and Disease (TRiMAD) Symposium, "Mitonuclear epistasis for fitness, aging and disease in Drosophila", Penn State, 11/2015.

Vanderbilt University, Department of Biology, "Mitonuclear epistasis for fitness, aging and disease in Drosophila", 3/21/16

Evolutionary Biology Center, Uppsala University, Sweden, "Mitonuclear epistasis and the evolutionary genetics of fitness, aging and disease in Drosophila", 3/28/16

The Allied Genetics Conference, Genetics Society of America, Orlando FL, "Can epistasis or GxE be predictable? Lessons from mitonuclear interactions in Drosophila" 7/15/16

Brown University, By Faculty For Faculty Lecture Series, "Genes and Environment in Evolution and Disease: Common Features from Our Different Genomes, 11/7/16

University of Nebraska, Department of Biology, "Mitonuclear epistasis and coevolution in fitness, aging and disease", 11/10/16

Bowdoin College, Department of Biology, "Genes and Environment in Evolution and Disease: Common features from our different genomes", 4/6/17

Frontiers in Metabolism: From system physiology to precision medicine, EPFL and EMBO Press Life Sciences Symposium, Lausanne, Switzerland, "Mitonuclear genetic interactions and personalized genomic responses to diet in Drosophila, 10/24/2017

Society of Molecular Biology and Evolution Satellite Meeting, Mitochondrial Genomics

- and Evolution, Ein Gedi, Israel, "Mitonuclear coevolution, epistasis, GxE and the genetics of complex traits, 09/03/2017
- 115th International Titisee Conference: Evolutionary Mitochondrial Biology: Molecular, Biochemical and Metabolic Diversity, Boehringer Ingelheim Fonds, Titisee, Germany, "Mitonuclear interactions affecting sex-specific fitness traits and transcriptional responses to environmental stress in *Drosophila*", 3/30/2017
- Society of Molecular Biology and Evolution, Annual Meeting, Austin Texas, "Mitonuclear transcriptomes uncover common features of epistasis (GxG) and genotype x environment (GxE) interactions in *Drosophila*", 7/03/2017

TEACHING

- Evolutionary Biology (BioMed 48), Lecture course, 75-120 students
 Taught single-handedly each year since 1992 (sabbaticals in 2002, 2009).
 39 Lectures (50 min. each), 3 problem sets, 3 hour-exams, and a final
 Individual student exercises with *Drosophila* populations
 Weekly discussion sections of primary literature lead by Graduate TAs
- Evolutionary Genetics (BioMed 141), Seminar and Lab course, ~20 students
 Taught single-handedly every other spring semester since 1993.
 Seminar/Lecture 2x/week for 1.5 hours, Lab 1x/week for 3 hours
 4 wet-labs using molecular genetic methods, 4 computer labs using current
 population genetics and phylogenetic software
 5 Problem sets, 5 Lab write-ups, weekly quizzes
 Final Grant Proposal in NSF-format on individual research projects developed
 during the semester.
- Foundations of Living Systems (BioMed 20), Lecture course ~350 students
 Lectures on Ecology and Evolution, Genomics, Spring 2008
- Graduate Seminars
 Phylogenetics (1994),
 Modern Synthesis (1996)
 Quantitative Genetics (1998)
 Phylogenetics (2001)
 Environmental Genomics (2004)
 Tropical Ecology (2006)
 Neutral Models in Ecology and Evolution (2007)
 Biodiversity (2008)
 Reverse Ecology (2011-2016), IGERT Core course, Fall & Spring Semesters.
- Guest Lectures
 Genetics (BioMed 47, 154: DNA Fingerprinting and Forensic Analysis)
 Bioinformatics (Statistical Methods in Bioinformatics: DNA sequences)
 Neurobiology 104 Human Brain Evolution
 Anthropology 173 Human Variation
- Molecular Evolution Workshop, Marine Biological Laboratories, Woods Hole, MA,
 Workshop on Molecular Evolution, two lectures 2000-2007, "Neutrality tests of
 DNA sequences" and "Detecting selection using inter-locus contrasts"

Postdoctoral Advisees

Lisa Kann, Ph. D. University of Rhode Island, 1993; B.A., Oberlin College, 1987
Michael R. Palmer, Ph.D. University of Kansas, 2000; B.A. Hartwick College 1995.
Daniel Weinreich, Ph.D. Harvard University, 1998; B.S. University of Michigan, 1983
Colin Meiklejohn, Ph.D. Harvard University, 2004, B.S. University of Chicago, 1999
Kristi Montooth, Ph.D. Cornell University, 2004, B.S. UC Irvine, 1999
Lei Zhu, Ph.D. SUNY Stony Brook, 2009, B.S. Fudan University, 2002
James Mossman, Ph.D. University of Sheffield, UK, 2008, M.S. Univ. Sheffield, 2004
Eugenia Villa-Cuesta, Ph.D. Universidad Autónoma de Madrid, 2004, M.S. 1999

Graduate Students

Alice Brown, Ph.D., April 1995, Brown University; “Molecular Ecology of the Northern Acorn Barnacle, *Semibalanus balanoides*”; M.A., 1985 from Oregon State University; B.S., 1982, Brown University.
Bianca Brown, Ph.D. candidate in Ecology and Evolutionary Biology, degree expected 6/2020
Bruce Bryan, M.S. in Ecology and Evolution Brown University, expected 5/2011; “Evolutionary genetics of mitochondrial function in *Drosophila* sperm”. B.A. Marlboro College, 2002
Patrick Flight, Ph.D. in Ecology and Evolution, Brown University, 9/2011. “Environmental genomics of the acorn barnacle”. B.A., Biology, Duke University.
Adam Fry, Ph.D. January 2004. Ecology and Evolution, Brown University; “Effects of *Wolbachia* on longevity and fecundity of *Drosophila melanogaster*”; M.S. Univ. of Minnesota, 1997. Currently Lecturer, University of Connecticut
Matthew Hamilton Ph.D., June 1995 Brown University; “Oligonucleotide Fingerprint Analysis of Neighborhood Size in the Salt March Perennial, *Limonium carolineanum*”; B.A. 1990 University of Chicago. Currently Associate Professor Georgetown University.
Robert Haney, Ph.D. in Ecology and Evolution, Brown University, 6/07; “Phylogeography of three estuarine fish in eastern North America”; BA, and M.S. 2001 SUNY Buffalo
Marissa, Holmbeck, Ph.D. in Molecular Biology, Cellular Biology and Biochemistry, 9/14, “Mito-nuclear interactions and environmental conditions that impact *Drosophila* physiology and lifespan”; B.S. 2008 UC Irvine.
Steve Kilpatrick Ph.D. September 1994 Brown University; “Conditional Hitchhiking of mtDNA in Experimental Populations of *Drosophila melanogaster*”; B.S., 1987 Eastern College, PA. Currently Associate Professor Univ. of Pittsburgh.
Joaquin Nunez, Ph.D. candidate in Ecology and Evolutionary Biology, degree expected 6/2020.
Paul Schmidt Ph.D. May 1999, Brown University; “Balancing Selection at the *Mpi* locus in the Northern Acorn Barnacle”; B.A. 1993 Holy Cross College. Currently Assistant Professor, University of Pennsylvania
John Santiago, Ph.D. student in Molecular Biology, Cellular Biology and Biochemistry, degree expected 2017; B.S, M.S., Florida Tech, 5/2011
Adam Spierer, Ph.D. student in Ecology and Evolutionary Biology, expected 2018; B.S. Colby College 5/2013
Rebecca Wagaman, M.S. in Molecular Biology, Cell Biology and Biochemistry, expected 6/2011, “Mitochondrial genetics of aging in *Drosophila*”

Shawn Williams, Ph.D. Student in Molecular Biology Cellular Biology and Biochemistry, expected 5/2020; "Mitochondrial genetics of lipid metabolism and stress resistance in Drosophila", Sc.B., John Jay College, CUNY, 5/2015; HHMI Gilliam Fellowship recipient

Ph.D. Thesis Committees (other than advisees), EEB Department

Dale Ritter, 1995, Functional Morphology of the Expaxial Muscles in Lizards
Jennifer Gray, 1996, Functional morphology of flying squirrels
George Leonard, 1996, Community Ecology of the Rocky Intertidal
Shane Heschel, 2000, Quantitative Genetics of Drought Stress in Jewelweed
Pat Ewanchuck, expected 2002, Structure of Salt March Communities
Chris Siddon, expected 2003, Multiple Predator Effects in a Subtidal Community
Brian Silliman, expected 2005, Trophic Cascades in Southern Salt Marshes
Yuko Toyonaga, expected 2005, Physiological Genetics of Light Response in Arabidopsis
Andrew Altieri, expected 2006, Trophic Cascades of Massive Mussel Settlement
David Baier, 2005, Functional Morphology of the Avian Shoulder.
Melissa Lage, 7/2006, Microbial Diversity of Salt Marshes
Eric von Wettberg, expected 2006, Gene Duplication and Adaptive Light Responses in Arabidopsis
Erika Lasek-Nesslequist, expected 2009, "sex and recombination in Giardia, Brown/MBL Student
Alan Bergland, 5/2009, "Phenotypic plasticity for ovariole number in Drosophila
Christopher Graves, "Evolution of evolvability", PhD expected 2016
Terry Dial, "Form, function and performance across a range of offspring size in the Trinidadian guppy (Poecilia reticulata)" PhD expected 2016
Priya Nakka, "Population genomics of humans", EEB/CCMB, PhD expected 2019
Kim Cohen Neil, "Conservation genetics of the New England Cottontail", PhD expected 2019
Stephen Rong, "Distinguishing hard and soft sweeps from genomic data", 3rd year PhD student
Bianca Brown, "Mammalian gut microbiome and conservation", 3rd year student
Catriona Munro, "Evolution of transcriptomes in Siphonophores", 5th year student

Ph.D. Thesis Committees, Graduate Program in Molecular Biology, Cell Biology and Biochemistry

Andrea Nerrozzi, 1995, Chloroplast DNA Replication in Chlamydomonas, Annette Coleman, Advisor
Julian Wong, 2005, Biochemistry of Fertilization Envelope Formation in Sea Urchins, Gary Wessel, Advisor
Selena Gell, 2008-2011, RNA interference and the genetics of segregation distortion in Drosophila, Robert Reenan, Advisor
Yuko Hasegawa, 2008-2013, Detection of microbial samples in the environment using fluorescent probes; Mitch Sogin, Gary Borisy Advisors
Marissa Holmbeck, 2013, Mitochondrial-nuclear incompatibility in translation affects mitochondrial function and aging in Drosophila
John Santiago, 2013-2016, Mitochondrial modification of TOR signaling and homeostasis in Drosophila

Vanessa Scialabba, "Rapamycin and mitochondrial function in mouse liver", MCB Graduate Program, PhD expected 2019
Kevin Murphy, "The Aging Heart: Mechanisms of Arrhythmogenesis and Sudden Cardiac Death", 5th year PhD student

Undergraduate Senior Thesis Projects

Mark Siegal, 1992, Selection on Mitochondrial DNA in Experimental Populations of *Drosophila melanogaster*; Ph.D. Harvard Univ., 1998 (HHMI Predoctoral Fellowship). Currently Assistant Professor, NYU.

Michele Dorfsman, 1993, Transmission Genetics of mtDNA in *Drosophila melanogaster*. M.D., University of Pennsylvania, 1997. Currently a Physician, Pittsburg, PA

Kristin Zvonar, RAPD Variation in the Planarian, *Dugesia trigrina*; M.D., Univ. of Pittsburgh

Jeff Townsend, 1994, Size Variation and Concerted Evolution in the mtDNA of *Drosophila melanogaster*; Ph.D. Harvard University 2002. Currently Assistant Professor, Yale University

Mike Kiparsky, 1995, Selection on Nuclear and Mitochondrial Genes in Experimental Populations of *Drosophila melanogaster*. Ph.D. Candidate, UC Berkeley

Carolyn Hutter, 1995, Competition Between Distinct mtDNAs in Different Nuclear Genetic Backgrounds; M.S. Cornell, 1998. Science Education Coordinator, NYC.

Eleanor Brown, 1995, Heteroplasmy in Experimental Populations of *Drosophila melanogaster*; Law School Yale University 1998

Aaron May, 1996, With Whom Should an Endangered Population Hybridize: and Experimental Study in *Drosophila melanogaster*; Law School Stanford University, 1999

Dan Lerman, 1997, Thermal Selection in Experimental Populations of *Drosophila melanogaster*; Ph.D. University of Chicago 2003. HHMI Predoctoral Fellowship, AAAS Postdoctoral Fellowship.

Erica Rosenblum, 1997, The effect of aging and mating on the transmission of mtDNA in *Drosophila melanogaster*; Ph.D. UC Berkeley; Postdoc, Lawrence Berkeley Labs; Assistant Professor, University of Idaho.

John Morrow, 1997, Phylogeny of Gulls and Terns inferred from mtDNA Sequences; M.D. Columbia University

Ron Palmon, 1997, Computer Simulation of Selection at Multiple Levels: a Model for mtDNA Inheritance; M.D. NYU

Roger Han, 1998, Phylogeny of Gulls and Terns Inferred from CytB and 16S gene in mtDNA; M.D. Brown University

Dan Basila, 1998, Multiple Approaches to the Study of Thermal Selection in *Drosophila melanogaster*. PhD candidate UT Austin; Playwright

Andy Kern, 1999, Spatial and Temporal Variation in Microsatellite Frequencies in the Northern Acorn Barnacle. Ph.D. UC Davis (HHMI Predoctoral Fellowship Recipient); Postdoc UC Santa Cruz; Assistant Professor, Dartmouth College.

Brent Cezairliyan, 2000, Conservative and Radical Neutrality Tests of Mitochondrial and Nuclear Protein Sequences; Ph.D. MIT with Robert Saur; Postdoc, Harvard Medical School with Fred Ausubel.

Paula Spaeth, 2001, Neutral and Adaptive Variation at the Mpi and Gpi Enzyme Loci in the Acorn Barnacle, *Semibalanus balanoides*. Ph.D. Stanford University, Tim Sackton, 2001, Coadaptation of Nuclear and Mitochondrial Genomes in *Drosophila simulans*. Ph.D. 2009 with Andy Clark, Cornell; Postdoc with Dan Hartl, Harvard.

Sarah Kingan, 2002, Adaptive Evolution of Semenogelin in Hominoids. Currently Ph.D. 2009 with Dan Hartl, Harvard University

Jeff Rasmussen, 2002, Confidence limits on “informative” gene sets from Affymetrix microarray experiments. Ph.D., University of Washington, Department of Genome Sciences

Brandon Finegold, 2002, Population structure of Galapagos samples of *Megabalanus* barnacles inferred from mtDNA.

Ellen Goldstein, 2004, Functional consequences of mtDNA introgression between *Drosophila* species. M.D candidate, Einstein College of Medicine

Zelalem Alehegn, 2004, Protein substitutions in mitochondrial proteins of humans and other apes.

Lietta Nicolaides, 2005, Genetic architecture of oxidative stress resistance in mitochondrial introgression lines of *Drosophila*. Research Assistant, University College London.

Johanna Kowalko, 2005, Biochemical flexibility and the adaptation to environmental heterogeneity in the acorn barnacle, *Semibalanus balanoides*. PhD candidate, Harvard University.

Eric Franzosa, 2006, Computational analyses of selection on human mitochondrial tRNAs. Ph.D. Candidate, Bioinformatics, Boston University.

Jeffrey Hofmann, 2005-2008. Mitochondrial genetics of aging and metabolic disease in *Drosophila*. MD/PhD candidate Brown University.

Sean Prior, 2007, Mitonuclear genetics of salinity tolerance in *Fundulus*.

Max Rubinstein, 2008, Mitochondrial genetics of aging in *Drosophila*, Medical Student, Boston University.

Ikenna Achilihu, 2008, Genetic variation for hypoxia in *Fundulus*

Maggie Sogin, 2009, Population genetics of *Fundulus*, PhD student University of Hawaii.

Anya Brown, 2009, Population genetics of *Fundulus*. M.S. Student Cal State University, Northridge

Leann Barnes, 2009, Population genetics of polluted and clean sites in *Fundulus*, Research Assistant, Brown University.

Stephanie Le, 2010, Mitochondrial genetics of desiccation and starvation stress in *Drosophila*

Deborah Gorth, 2010, Nano-silver toxicity in *Drosophila*

Nicholas Jourjine, 2011, Mito-nuclear genetics of physiological stress in *Drosophila*

Eli Moss, 2011, Computational analysis of mitochondrial-nuclear genetic interactions in *Drosophila*

Paul Ingelmo, 2011, Mitochondrial genotype effects on longevity extension by diet restriction in *Drosophila*

John Vu, 2012, How dietary and hypoxic stress affect mitochondrial-nuclear epistasis for performance traits in *Drosophila*

Melanie Berger, 2013, Mitochondrial-nuclear epistasis for response to dietary stress in *Drosophila*

Yawei (Jenn) Ge, 2013, Mitochondrial genotypes alter nuclear transcriptional responses to hypoxia in *Drosophila*.
 Christina Farrell, 2014, Mitochondrial biogenesis and enzyme function in mtDNA replacement strains of *Drosophila*
 Taliya Lantsman, 2014, Rapamycin enhances mitochondrial function in mtDNA replacement strains of *Drosophila*
 Julia Donner, 2014-15, Mitonuclear genotype interactions and *Drosophila* response to cigarette smoke
 Russyan Mark Mabeza, 2014-15, Using Mitochondrial DNA Knock Out to Elucidate Time Course of Mitochondrial Degradation.
 Denise Yoon, 2015-2017, Models of neurodegeneration and reproductive disease using a mitochondrial knockout system in *Drosophila*
 Brian Franklin, 2015-2017, Mitonuclear interactions alter the impact of diet restriction on starvation resistance, and aging in *Drosophila*.

SERVICE TO THE UNIVERSITY

Member, Provost's Chairs Agenda Committee, 2016-2018
 Member, Committee to Evaluate the Center for Computational Molecular Biology, 7/2016
 TPAC Tenure Appointment Review Committee, Dr. Dennerly, 4/2015
 Member, Provost Search Committee, Spring 2014
 Member, Bioinformatics Task Force, for OVPR Spring 2014
 Member, Provost's Agenda Committee for Department Chairs Meetings, 2013-14
 Chair, Department of Ecology and Evolutionary Biology, 7/2013 – present
 Member, Tenure, Promotions and Appointments Committee, 9/2011-2013, Vice Chair 2012-2013
 Member, Search Committee, EEB Faculty Search, 2012-2013
 Member, Presidents Science Advisory Council Summer 2012-2013
 Member, Educational Innovation Strategic Planning Committee, Fall 2012
 Member, MBL Futures Committee, Fall 2012
 Member, BioMed Strategic Planning Committee, Summer-Fall 2012
 Member EEB Admissions Committee, 2012, 2013
 Member, Search Committee for Dean of the Faculty, Spring 2011
 Review Committee, Brown-MBL graduate Program, 1/2011
 Member, Search Committee, Assistant Professor in Bioinformatics, 2011
 Member, Search Committee for faculty position in the Josephine Bay Paul Center at MBL, 2008-2009
 Member, Instructional Advisory Committee for Dean of the Graduate School, Sheila Bonde, Fall 2008
 Member, Advisory Search Committee for the Dean of Biology and Medicine, 2008
 Member, Steering Committee for expansion of the Brown/MBL collaboration, 2007-2008
 Chair, Working Group on Teaching Assistant positions in Biology and Medicine, 2008
 Director of Graduate Studies, Department of Ecology and Evolutionary Biology, 2003-present
 Director, Graduate Fellowship program, RI EPSCoR program, 2006-2009
 Chair, BioMed Committee to Reevaluate Tenure, Promotion and Reappointment, 2006-2007
 Member, Undergraduate Science Education Committee, 2006-2007
 Member, Advisory Committee to President Simmons for Provost Search, 2006
 Member, Search Committee for Assistant Professor of Computational Biology, 2005-2006, 2006-2007

Member, Academic Priorities Committee, 2003-2006; Vice Chair 2004-2006
 Member, Executive Committee, Center for Computational Molecular Biology, 2004-present
 Member, Action Group for Dean Position in Graduate and Postdoctoral Studies, Spring 2005
 Member, Search Committee, Dean Position in Graduate and Postdoctoral Studies, Fall 2005
 Member, Search Committee, Assistant Professor, Ecology and Evolutionary Biology
 Member, Search Committee, Assistant Professor, Center for Computational Molecular Biology
 Member, Search Committee, Dean of the Graduate School, Spring 2005
 Member, Search Committee, Dean of Medical and Biological Sciences, Spring 2003
 Member, Undergraduate Biology Curriculum Committee, 1995-present
 Director, Brown University DNA Sequencing Facility
 Member of Computational Biology Committee to design and establish an Sc.B. Degree in Computational Biology, 1997
 Member of Advisory Committee for the Center for Genetics and Genomics, MCB Department
 Chair, Faculty Search for Genomics Position, Molecular Biology, Cell Biology, and Biochemistry, 2000-2001
 Chair, Faculty Search for Computational Biology; Dept. of Molecular Biology, Cell Biology, and Biochemistry
 Member Search Committee, Evolutionary Genetics Department of Ecology and Evolutionary Biology; 1995 (Adjunct Position), 1996 (Tenure track position)
 Member of the Molecular Biology Facility Committee, MCB Department
 Colloquium Lecture and Discussion, Inauguration Weekend for President Ruth Simmons, Brown University, October 14, 2001: Must We Grow Old: Genetics of Aging (with Prof. Wharton and Tatar)
 Joint Appointment in the Department of Molecular Biology, Cell Biology and Biochemistry (MCB); Serving on Ph.D. Committees, Advisory Committees, and as a Trainer in the MCB Graduate Program
 Undergraduate Concentration Advisor, for A.B. Biology, Sc.B. Biology and Applied Math-Biology, Sc.B. in Computational Biology Degrees.

SERVICE TO THE COMMUNITY – EDUCATIONAL OUTREACH

Bookshelves in Biology, 1991: A Unit for the Use of Computers in Evolutionary Tree Building, Lecture in NSF-Funded Program for Outreach with area High School Teachers, PI, Prof. Peter Heywood
 Zooscope, 1995: Lecture on Conservation Genetics and Classroom Exercises for Experimental Analysis of Captive Breeding Programs, using *Drosophila*. NSF-Funded Program for Outreach with area High School Teachers, PI, Prof. Peter Heywood
 Genes and Genomes 2001: Lecture on Using *Drosophila* Selection Experiments to Map Genes; Computer Exercises for Classroom analysis of *Drosophila* Genome Web Page; Programs for Regional High School Teachers and Interested Public, May 5, 2001, Brown University.
 Barrington High School, 2005: Lecture on Natural Selection and the Evolutionary Genetics of Climate Change: a *Drosophila* model. Part of the Broader Impacts Aim of NSF Grant: “Genetic architecture of thermal selection in *Drosophila*”.
 Wheeler School, and Vartan Gregorian School; IGERT Trainee Outreach activities, January 2015

