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Dept. of Plant, Soil, and Insect Sciences
Division of Entomology
University of Massachusetts at Amherst
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Academic Positions:

- September 1998- : Adjunct Research Assistant Professor
Department of Plant, Soil & Insect Sciences
Graduate Program in Organismic and Evolutionary Biology
University of Massachusetts at Amherst
- Jan. 1996- August 1998: Assistant Professor
Department of Biology, University of Texas at Arlington
- Dec. 1994- Jan. 1996: Faculty Associate
Department of Biology, University of Texas at Arlington
- March 1993- June 1994: Lecturer in the College
University of Chicago
- Sept. 1992- Dec. 1994: Postdoctoral Research Associate with Dr. Michael Wade.
Department of Ecology and Evolution. U. of Chicago

Education:

- Ph.D.: Received October 1992, University of Rochester
Degree in Biology (Ecology and Evolutionary Biology track)
Advisor: Dr. Chung-I Wu
Dissertation title: "The genetics of hybrid male sterility in three sibling species of the *Drosophila melanogaster* species subgroup." (Defended 16 July 1992)
- M.S.: Received May 1989, University of Rochester
Degree in Biology (Ecology and Evolutionary Biology track)
- B.A.: Received May 1987, College of William and Mary
Major in Biology (High Honors in research)

Advisor: Dr. Bruce Grant, Thesis Title: "The effect of relatedness among foundresses on the sex ratios of their brood in the parasitoid wasp, *Nasonia vitripennis*."

Awards and Honors:

National Science Foundation Grant. "Incorporating developmental genetic pathways in speciation theory". Total Budget \$116,999. September 2000 - December 2003 (includes no-cost extension).

Research Enhancement Program (UTA Internal grant). "Investigation of postmating reproductive isolation between Zimbabwe and non-Zimbabwe *Drosophila melanogaster*". Total Budget \$9692.50. September 1996- December 1997.

Genetics Training Grant. (N. I. H.) July 1990- July 1991.

Departmental Graduate Teaching Award. 1989.

Robert K. Sproull Fellowship. (U. of Rochester scholarship) September 1987- September 1989.

Phi Sigma (Biology Honorary Society). 1987.

Publications:

Book:

Johnson, N. A. 2007. *Darwinian Detectives: Revealing the Natural History of Genes and Genomes*. Oxford University Press. xx+220 pg. (Alternate selection of the Scientific American Book Club.)

Peer-Reviewed Articles and Book Chapters:

Johnson, N. A. 2007. The micro-evolution of development. *Genetica* 129: 1-5.

Johnson, N. A. 2007. Is Evolution only a theory? Scientific methodologies and evolutionary biology. Pp. 339-360 in A. J. Petto and L. R. Godfrey (eds.) *Scientists Confront Intelligent Design and Creationism*. W. W. Norton.

Johnson, N. A. and A. H. Porter. 2007. Evolution of branched regulatory genetic pathways: Directional selection on pleiotropic loci accelerates developmental system drift. *Genetica* 129: 57-70.

Werle, S., N. A. Johnson, E.L. Dumont, P. Parasiewicz. 2007. Ecological dissimilarity analysis: A simple method of demonstrating community-habitat correlations for frequency data. *Northeastern Naturalist* 14: 439-446.

Johnson, N. A. 2006. Patterns and processes of speciation: The evolution of reproductive isolating barriers. Pp. 374-386 in C. Fox and J. B. Wolf. (eds). *Evolutionary Genetics*. Oxford University Press.

Hastings, A., P. Arzberger, P., B. Bolker, S. Collins, A. R. Ives, N. A. Johnson, and M. A. Palmer. 2005. Quantitative bioscience for the 21st century. *BioScience* 55: 511-517.

Johnson, N. A. and R. M. Kliman. 2002. Hidden evolution: Progress and limitations in detecting multifarious natural selection. *Genetica* 114: 281-291.

Porter, A. H. and N. A. Johnson. 2002. Speciation despite gene flow when developmental pathways evolve. *Evolution* 56: 2103-2111.

Johnson, N. A. and A. H. Porter. 2001. Toward a new synthesis: Population genetics and evolutionary developmental biology. *Genetica* 112/113: 45-58.

Johnson, N. A. 2000. Gene interaction and the origin of species. Pp. 197-212 in J. B. Wolf, E. D. Brodie III., and M. J. Wade (eds.). *Epistasis and the Evolutionary Process*. Oxford University Press, New York.

Johnson, N. A. and A. H. Porter. 2000. Rapid speciation via parallel, directional selection on regulatory genetic pathways. *Journal of Theoretical Biology* 205: 527-542.

Noor, M. A. F., J. Hey, and N. A. Johnson. 2000. Gene flow between *Drosophila pseudoobscura* and *D. persimilis*. *Evolution* 54: 2174-2175.

Wade, M. J., N. A. Johnson, and Y. Toquenaga. 1999. Temperature effects and genotype by environment interactions (GEI) in hybrids: Haldane's rule in flour beetles. *Evolution* 53: 855-865.

Phillips, P. C. and N. A. Johnson. 1998. The population genetics of synthetic lethals. *Genetics* 150: 449-458.

Sasa, M. M., P. T. Chippindale, and N. A. Johnson. 1998. Patterns of postzygotic reproductive isolation in frogs. *Evolution* 52: 1811-1820.

Wade, M. J., N. A. Johnson, R. Jones, V. Siguel, and M. McNaughton. 1997. Genetic variation segregating in natural populations of *Tribolium castaneum* affecting traits observed in hybrids with *T. freemani*. *Genetics* 147: 1235-1247.

Johnson, N. A. and M. J. Wade. 1996. Genetic covariances within and between species: indirect selection for hybrid inviability. *Journal of Evolutionary Biology* 9: 205-214.

Wu, C.-I., N. A. Johnson, and M. F. Palopoli. 1996. Haldane's rule and its legacy: Why are there so many sterile males? *Trends in Ecology and Evolution* 11: 281-284.

- Johnson, N. A. and M. J. Wade. 1995. Conditions for soft selection favoring the evolution of hybrid inviability. *Journal of Theoretical Biology* 176: 493-499.
- Cabot, E. L., A. W. Davis, N. A. Johnson, and C.-I. Wu. 1994. Genetics of reproductive isolation: Complex epistasis underlying hybrid sterility in the *Drosophila simulans* clade. *Genetics* 137: 175-189.
- Robinson, T., N. A. Johnson, and M. J. Wade. 1994. Postcopulatory, prezygotic isolation: Intraspecific and interspecific sperm precedence in *Tribolium* spp., flour beetles. *Heredity* 73: 155-159.
- Wade, M. J. and N. A. Johnson. 1994. Reproductive isolation between two species of flour beetles, *Tribolium castaneum* and *T. freemani*: Variation among and within geographical populations of *T. castaneum*. *Heredity* 72: 155-162.
- Wade, M. J., N. A. Johnson, and G. Wardle. 1994. Analysis of autosomal polygenic variation for the expression of Haldane's rule in flour beetles. *Genetics* 138: 791-799.
- Wade, M. J., H. Patterson, N. W. Chang, and N. A. Johnson. 1994. Postcopulatory, prezygotic isolation in flour beetles. *Heredity* 72: 163-167.
- Johnson, N. A., H. Hollocher, E. Noonburg, and C.-I. Wu. 1993. The effects of interspecific Y chromosome replacements on hybrid sterility within the *Drosophila simulans* clade. *Genetics* 135: 443-453.
- Johnson, N. A. and C.-I. Wu. 1993. Evolution of postmating reproductive isolation: Measuring the fitness effects of chromosomal regions containing hybrid male sterility factors. *The American Naturalist* 142: 213-223.
- Perez, D. E., C.-I. Wu, N. A. Johnson, and M.-L. Wu. 1993. Genetics of reproductive isolation in the *Drosophila simulans* clade: DNA marker-assisted mapping of a hybrid-male sterility gene, *Ods*. *Genetics* 134: 261-275.
- Wu, C.-I., D. E. Perez, A. W. Davis, N. A. Johnson, E. L. Cabot, M. F. Palopoli, and M.-L. Wu. 1993. Molecular genetic studies of postmating reproductive isolation in *Drosophila*. pp. 191-211 in *Mechanisms of Molecular Evolution*. N. Takahatta and A. G. Clark (eds.) Sinauer Associated Press, Sunderland, MA.
- Johnson, N. A., D. E. Perez, E. L. Cabot, H. Hollocher, and C.-I. Wu. 1992. A test of reciprocal X-Y interactions as a cause of hybrid sterility in *Drosophila*. *Nature* 358: 751-753.
- Johnson, N. A. and C.-I. Wu. 1992. An empirical test of the meiotic drive models of hybrid sterility: Sex-ratio data from hybrids between *Drosophila simulans* and *Drosophila sechellia*. *Genetics* 130: 507-511.

Wu, C.-I., J. R. True, and N. Johnson. 1989. Fitness reduction associated with the deletion of a satellite DNA array. *Nature* 341: 248-251.

Educational Materials:

Johnson, N., C. Ueckert, E. DuBrul, and J. C. Glase. 2008. *Test File* to accompany Savada et al. *Life: The Science of Biology* (8th edition). Sinauer Associates, Inc.

Johnson, N. A. 2003. "Biodiversity", "Evolution and Phylogenetics", "Genes and Development", "Human Evolution", and "Neurobiology" on-line text chapters in *Rediscovering Biology: Molecular to Global Perspectives*. Oregon Public Broadcasting/ Annenberg.

Johnson, N. A. 2003. Scientific editor for the on-line text. *Rediscovering Biology: Molecular to Global Perspectives*. Oregon Public Broadcasting/ Annenberg.

Commentaries:

Hegde, J. H. and N. A. Johnson. 2006. Folk psychology meets folk Darwinism. Commentary on Bering "The folk psychology of souls". Behavioral and Brain Sciences 29: 476-477.

Kliman R. M. and N. A. Johnson. 2005. What every undergraduate should know about evolution (and why). BioScience 55: 926-927.

Noor, M. A. F. and N. A. Johnson. 2005. A kingpin of academic inclusive fitness: The history and contributions of Bruce Grant. Genetics 171: 867-871.

Johnson, N. A. 2002. Strong balancing selection in the regulatory region of *CCR5*. Trends in Genetics 18: 501.

Johnson, N. A. 2002. The drive behind meiotic drive. Trends in Genetics 18: 392-3.

Johnson, N. A. 2002. One origin for maize. Trends in Genetics 18: 344.

Johnson, N. A. 2002. Sixty years after "Isolating mechanisms, evolution, and temperature": Muller's legacy. Genetics 161: 939-944. (Historical Perspectives).

Johnson, N. A. 2002. Why is seminal fluid toxic? Trends in Genetics 18: 181. Also published on-line at news.bmn.com/commentary.

Johnson, N. A. 2001. Variation in a region of chromosome 4 may contribute to the probability of living to age 100. Genome Biology. Published on-line at www.genomebiology.com/2001/2/11/reports/0039/.

Johnson, N. A. 2001. Local properties of the genome can bias QTL analyses. Trends in Genetics 17: 624.

Johnson, N. A. 2001. Do Tierran programs dream of Darwinian dynamics? Trends in Genetics 17: 491-492.

Johnson, N. A. 2001. Genetic interactions maintain Y chromosome variation. Trends in Genetics 17: 379.

Johnson, N. A. 2000. Speciation: Dobzhansky-Muller incompatibilities, dominance, and gene interaction. Trends in Ecology and Evolution 15: 480-482.

Johnson, N. A. 1998. Postzygotic reproductive isolation: Epigenetics for an epiphenomenon? Journal of Evolutionary Biology 11: 207-212.

Johnson, N. A. 1997. Selfish genetic elements: Long-range dynamics predicted by non-equilibrium models. Trends in Ecology and Evolution 12: 376-378.

Wu, C.-I. and N. A. Johnson. 1996. Endless forms, Several powers. (News and Views). *Nature* 382: 298-299.

Encyclopedia articles:

Johnson, N. A. 2008. James Crow. In *Harvard's Companion to Evolution*. Harvard University Press. (In press).

Johnson, N. A. 2008. Michael J Wade. In *Harvard's Companion to Evolution*. Harvard University Press. (In press).

Johnson, N. A. 2002. Haldane's rule. In *Encyclopedia of Evolution*. Oxford University Press.

Book Reviews:

Johnson, N. A. 2007. "Genes in Conflict". Review of A. Burt and R. Trivers. 2006. *Genes in Conflict*. *Quarterly Review of Biology* 82: 270-271.

Johnson, N. A. 2005. "Speciation". Review of J. A. Coyne and H. A. Orr. 2004. *Speciation*. *Reports of the National Center for Science Education*. 215(3-4): 40-41.

Johnson, N. A. 2002. "(Re) structuring Darwinism". Review of S. J. Gould. 2002. *The Structure of Evolutionary Theory*. *Trends in Genetics* 18: 656-658.

Johnson, N. A. 2002. "A Foot in each world". Review of J. C. Avise. 2002. *Captivating Life: A Naturalist in the Age of Genetics*. *Trends In Genetics* 18: 272.

Johnson, N. A. 2001. "Also sprach *Homo mutans*". Review of S. Hubbell. 2001. *Shrinking the Cat: Genetic Engineering Before We Knew About Genes*. *Science* 294: 1659.

Johnson, N. A. 2001. "History of Darwin's laboratory". Review of E. J. Larson. 2001. *Evolution's Workshop: God and Science on the Galapagos Islands*. *Trends in Ecology and Evolution* 16: 588-589.

Johnson, N. A. 2001. "Reproductive success story". Review of T. Birkhead. 2000. *Promiscuity: An Evolutionary History of Sperm Competition*. *American Scientist* 89: 276-277.

Johnson, N. A. 2001. "It's a wonderful life: I win, you win". Review of R. Wright. 2000. *Non Zero: The Logic of Human Destiny*. *BioScience* 51: 65-66.

Johnson, N. A. 2000. "The case of the deformed frogs". Review of W. Souder. 2000. *A Plague of Frogs: The Horrifying True Story* and S. Krimsky. 2000. *Hormonal Chaos: The Scientific and Social Origins of the Environmental Endocrine Hypothesis*. *American Scientist* 88: 362-363.

Johnson, N. A. 2000. "Design flaw". Review of W. A. Dembski. 1999. *Intelligent Design: The Bridge Science & Theology* and K. R. Miller. 1999. *Finding Darwin's God: A Scientist's Search for Common Ground Between God and Evolution*. *American Scientist* 88: 274-275.

Johnson, N. A. 2000. "Brain teaser". Review of J. M. Allman. *Evolving Brains*. *Trends in Ecology and Evolution* 15: 77.

Johnson, N. A. 2000. "Am I not a fly like thee?" Review of J. Weiner. 1999. *Time, Love, Memory: A Great Biologist and His Quest for the Origins of Behavior*. *BioScience* 50: 267-268.

Johnson, N. A. 1999. "Cooperation and conflict at all levels". Review of R. E. Michod. 1999. *Darwinian Dynamics: Evolutionary Transitions in Fitness and Individuality*. *BioScience* 49: 833-834

Johnson, N. A. 1999. "User-friendly genome guide". Review of R. S. Hawley and C. A. Mori. 1999. *The Human Genome: A User's Guide*. *Trends in Genetics* 15: 162-163.

Research Notes:

Johnson, N. A. 1995. Sex ratios of F₁ hybrids between Zimbabwe and non-Zimbabwe *Drosophila melanogaster*. *Drosophila Information Service* 76: 99-100.

Johnson, N. A. 1994. Age effects on mating propensities in *Drosophila neotestacea*. *Drosophila Information Service* 75: 54-55.

Scientific Correspondence:

Wu, C.-I., N. A. Johnson, and M. F. Palopoli. 1996. *Trends in Ecology and Evolution* 11: 508.

White paper:

A. Hastings, P. Arzberger, B. Bolker, A. Ives, N. Johnson, and M. Palmer. 2003. Quantitative Biology for the 21st century. (Quantitative Environmental and Integrative Biology Workshop report).
http://www.sdsc.edu/QEIB/QEIB_final.html

Teaching Experience:

Primary course instructor for the following:

"Genes in Conflict". Graduate seminar course. UMASS. Fall 2006 (co-taught with B. Normark).

"Speciation". Graduate seminar course. UMASS. Fall 2004 (co-taught with A. Porter).

"Evolution of Sex Ratios". Graduate seminar course. UMASS. Fall 2003 (co-taught with B. Normark).

"Evolution of Genetic Systems". Graduate seminar course. UMASS. Fall 2001 (co-taught with B. Normark).

"Genetics". UTA. Spring 1996, Spring 1997, Fall 1997, Spring 1998. (This course had a typical enrollment of about 150 students each semester)

"Advanced Evolution". Graduate course. UTA. Fall 1995, Spring 1998.

"Molecular Genetics". Cross-listed Undergraduate and Graduate course. UTA. Fall 1996, Fall 1997 (1/2 of the course, co-taught with S. Payne).

"Species and Speciation". Graduate course. UTA. Spring 1995, Spring 1997.

"Ecology and Evolution of Parasites". Graduate seminar course. UTA. Fall 1996.

"Readings in Theoretical Biology" Graduate seminar course. UTA. Spring 1996. (co-taught with J. Grover).

"Selfish Genetic Elements". Graduate seminar course. UTA. Summer 1995.

"Genetics: Mendel, Molecules, and Populations". University of Chicago. Winter Quarter 1994.

"Evolution for non-majors". University of Chicago. Spring Quarter 1993.

Guest lectures given for the following:

"Intro. Biology" (A. Porter, UMASS). Spring 2007.

"Population Genetics" (A. Porter, UMASS). Spring 2001.

"Molecular Evolution" (R. Adkins, UMASS) Spring 1999.

"Evolution" (P. Phillips, UTA) Spring 1995, Fall 1996, Fall 1997; (P. Chippindale, UTA) Spring 1997.

"Molecular Systematics" (P. Chippindale, UTA) Spring 1996, Fall 1997.

"Population Biology and Evolution" (J. Spofford, U. Chicago) Spring 1992.

"Population Biology" (U. Nur and C-I. Wu, U. Rochester) 1989, 1990, and 1991.

Teaching Assistant for many courses (details upon request).

Research Interests: Evolutionary genetics. Particular interests include speciation, the micro-evolution of development, and genomic conflict (especially meiotic drive).

Extramural Seminars (1993-):

Massachusetts College of Liberal Arts (6/07); Massachusetts Institute of Technology (10/06); Harvard University (5/05); Ceder Crest College (Allentown, PA) (10/03); University of Vermont (2/01); Ramapo College (Mahwah, NJ) (5/00), Clark University (Worcester, MA) (3/00); College of William and Mary (11/99); College of Staten Island (CUNY) (5/99); Indiana University at Bloomington (3/99); Harvard University (11/98); University of Massachusetts at Amherst (5/98); University of Houston (3/98); University of Oregon (1/98); University of California at Berkeley (10/97); Arizona State University (11/95); Bowling Green State University (Ohio) (9/95); University of Wisconsin at Parkside (10/94); Syracuse University (9/94); University of Texas at Arlington (7/94); Stanford University (4/94); University of Michigan, Ann Arbor (3/93).

Contributed Presentations at meetings (1991-):

28 at national meetings (1991-2007): Details available upon request.

Service:

Reviewer for the following journals: Nature, Genetics, The American Naturalist, Evolution, Genetica, Journal of Heredity, Journal of Evolutionary Biology, Journal of Theoretical Biology, PLOS Biology, PLOS Genetics, PLOS One, BMC Biology, Ecology Letters, Molecular Biology and Evolution, Genetical Research, Proceedings of the Royal Society: Biological Sciences, Theoretical Population Biology, Zoological Studies, Biological Journal of the Linnean Society, and Herpetologica.

Frequent In-house Reviewer for books and book chapters:

Regular contributor to the News & Comment section of Trends in Genetics 1999-2001.

Served on two NSF Panels (Spring 2003, Fall 2006) and have been ad hoc reviewer for numerous NSF proposals.

Participated in two NSF Quantitative Environmental & Integrative Biology workshops. September 2000 and December 2002.

Chaired three contributed papers sections at the Evolution meetings (1993, 1996, 2001).

Served as Chair of UMASS OEB seminar committee 2006-

Served on UMASS OEB steering committee 2007-

Service on the following UTA Biology department committees: Biotech/ Institutional Laboratories Initiative grant (Sept-Nov. 1995), Seminar (August 1996- June 1998), and Long-range strategic planning (March-May 1997).

Served on the steering committee as UTA College of Science coordinator for the Symposium for Undergraduate Research and Creative Activities at UTA in both 1997 and 1998. I was also a Judge (1996), a Session Chair (1997), and the Coordinator of Session Chairs (1998).

Judge for the Graduate Research Symposium at UTA. November 1996, April 1998.

Judge for Science Constituency Council's "Science Week" at UTA. October 1997.

Judge at Hyde Park Career Academy science fair (Chicago high school) 1993, 1994. Contributor to (1996-8) and Biology dept. coordinator (equivalent to associate editor) for (1997-8) the UTA College of Science newsletter. (Articles available on request)

Participated in the Texas Science Hotline by answering questions (via e-mail) on various aspects of biology. April 1998.

Service on Graduate Student Committees:

I have served on 3 UMASS and 7 UTA graduate student committees. Details available upon request.

References available on request