JANNICE FRIEDMAN

Syracuse University Department of Biology
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EMPLOYMENT

Assistant Professor, Department of Biology, Syracuse University. 2012 – present

Post-Doctoral Fellow, Duke University. 2009-2011 (Advisor: J. H. Willis)
Funded by Natural Sciences and Engineering Research Council of Canada – PDF Fellowship

EDUCATION

Ph.D., Evolutionary Biology, 2009. University of Toronto (Advisor: S.C.H. Barrett)

M.Sc., Ecology, 2003. University of Calgary (Advisor: L.D. Harder)

Honor's B.Sc., Evolution, 2000. University of Toronto.

GRANTS, SCHOLARSHIPS AND AWARDS

Grants

NSF-NERC DEB 1732727 (*pending*): Adaptive evolution in biological invasions. PI: J. Friedman. Co-PI: M. Vallejo-Marin

NSF-NERC DEB 1732975 (*pending*): Evolution of clonal reproduction in variable environments. PI: J. Friedman.

NSF DGE 1735109 (*pending*): NRT: Transforming Graduate STEM Training through Interdisciplinary Multispecies antiMicrobial Education and ReSEarch (IMMERSE). PI: Ren, Co-PIs: Friedman, Manning, Nangia, Marchetti ($3,000,000)

NSF DEB Award 1546106: Mechanisms of sexual selection in plants with different reproductive strategies. PI: J. Friedman. 2016-2018. ($149,905)

NSF DEB Award 1354259: Understanding the evolutionary transition between annual and perennial life history strategies. PI: J. Friedman. 2014-2017. ($475,900)

Canadian Society for Ecology and Evolution Student Grant, 2009 ($500)

Alberta Challenge Grants in Biodiversity, 2002-2003 ($10,000)

Research Services Travel Grant, 2003 ($1000)

Fellowships and Scholarships

Post-doctoral Fellowship, Natural Sciences and Engineering Research Council of Canada, 2009-2011 ($80000)

Frederick P. Ide Graduate Award, 2008 ($2200)

Ontario Graduate Scholarships in Science and Technology, 2006-2008 ($30000)

Canadian Graduate Scholar, Natural Sciences and Engineering Research Council of Canada, 2004-2006 ($70000)

Valerie Anderson Graduate Fellowship, 2005 ($1992)

Mary H. Beatty Award, 2004 ($5000)

University of Toronto Fellowship, 2004 ($2500)

Post-Graduate Scholarship A, Natural Sciences and Engineering Research Council of Canada, 2000-2002 ($34500)

iCORE (Informatics Circle of Research Excellence) Fellowship, 2000-2002 ($24000)

Province of Alberta Graduate Scholarship, 2002-2003 ($6200)

Alberta Heritage Master's Scholarship, 2002 ($2000)

Graduate Studies Tuition Bursary, 2000 ($3000)

Biological Science's Scholarship, 2000 ($1500)

Dr. James A. and Connie P. Dickson Scholarship, 1999-2000 ($500)

University College Special In-Course Scholarship, 1998-1999 ($250)

F.C.A. Jeanneret University College Alumni Scholarship, 1996-1997 ($2400)

Ontario Secondary School Teacher's Federation Bursary, 1996-1997 ($1000)

Miller Thomson Foundation Scholarship, 1996-1997 ($1000)

University of Toronto Scholar, 1996-1997 ($3000)

Awards and Honors

Governor General's Academic Gold Medal of Canada for top PhD, 2010

Nominated as University of Toronto's candidate for NSERC Doctoral Prize, 2009

Annals of Botany Prize – best Graduate Student Talk at the Canadian Society for Ecology and Evolution Meetings, 2007

D. L. Bailey Award – best Ph.D. proposal in Botany, 2006

Best Student Presentation, Botany Graduate Seminar Series, 2005

ARTICLES PUBLISHED IN REFEREED JOURNALS

In review:

Twyford, A.D., A.M. Caola, P. Choudhary, R. Raina, and **J. Friedman**. Maintenance of a segregating major gene polymorphism in the common yellow monkey flower. In review.

Rubin, M.J. and **J. Friedman**. The role of multiple cold cues on phenology in the *Mimulus guttatus* species complex. In review.

Published:

Friedman, J. 2017. Variation in gene regulation underlying annual and perennial flowering in Arabideae species. Molecular Ecology.

Friedman, J., K.C. Hart, M. den Bakker. 2017. Losing one's touch: Evolution of the touch-sensitive stigma in *Mimulus guttatus* species complex. American Journal of Botany 104: 335-341.

Preston, J. C., M. McKeown, M. den Bakker, and **J. Friedman**. 2016. Comparative transcriptomics indicates a role for *Short Vegetative Phase* (*SVP*) genes in *Mimulus guttatus* vernalization responses. G3: Genes, Genomes, Genetics. 6: 1239-1249.

Twyford A.D. and **J. Friedman**. 2015. Adaptive divergence in the monkey flower *Mimulus guttatus* is maintained by a chromosomal inversion. Evolution. 69: 1476-1486.

Twyford A.D., M.A. Streisfeld, D.B. Lowry and **J. Friedman**. 2015. Genomic studies on the nature of species: adaptation and speciation in *Mimulus*. Molecular Ecology. 24: 2601-2609.

Friedman J. and M.J. Rubin. 2015. All in good time: understanding annual and perennial strategies in plants. American Journal of Botany. 102: 497-499.

Friedman, J., A.D. Twyford, J.H. Willis, and B.K. Blackman. 2015. The extent and genetic basis of phenotypic divergence in life history traits in *Mimulus guttatus*. Molecular Ecology. 24: 111–122.

Friedman, J. 2014. Genetic determinants and epistasis for life history trait differences in *Mimulus guttatus*. Journal of Heredity. 105:816-827

Yan, J., M.D. Bradley, **J. Friedman** and R.D. Welch. 2014. Phenotypic profiling of ABC transporter coding genes in *Myxococcus xanthus*. Frontiers in Microbiology 5: 352.

Friedman, J. and J.H. Willis. 2013. Major QTLs for critical photoperiod and vernalization underlie extensive variation in flowering in the *Mimulus guttatus* species complex. New Phytologist 199: 571-583.

Friedman J. 2011. Gone with the wind: understanding evolutionary transitions between wind and animal pollination in the angiosperms. New Phytologist 191: 911-913

Friedman J. and S.C.H. Barrett. 2011. Genetic and environmental control of temporal and size-dependent sex allocation in a wind-pollinated plant. Evolution 65: 2061–2074

Friedman J. and S.C.H. Barrett. 2011. The evolution of ovule number and flower size in wind-pollinated plants. American Naturalist 177: 246-257

Friedman J. and S.C.H. Barrett. 2009. Wind of change: new insights on the ecology and evolution of pollination and mating in wind-pollinated plants. Annals of Botany 103:1515-1527

Friedman J. and S.C.H. Barrett. 2009. The consequences of monoecy and protogyny for mating in wind-pollinated *Carex.* New Phytologist 181: 489-497

Stehlik I., **J. Friedman** and S.C.H. Barrett. 2008. Environmental influence on primary sex ratio in a dioecious plant. Proceedings of the National Academy of Science 105: 10852-10857

Friedman J. and S.C.H. Barrett. 2008. High outcrossing in the annual colonizing species *Ambrosia artemisiifolia*. Annals of Botany 101: 1303-1309

Friedman J. and S.C.H. Barrett. 2008. A phylogenetic analysis of the evolution of wind pollination in the angiosperms. International Journal of Plant Sciences 169: 49-58

Friedman J. and L.D. Harder. 2005. Functional associations of floret and inflorescence traits among grass species. American Journal of Botany 92: 1862-1870

Friedman J. and L.D. Harder. 2004. Inflorescence architecture and wind pollination in six grass species. Functional Ecology 18: 851-860

Dorken, M.E., **J. Friedman** and S.C.H. Barrett. 2002. The evolution and maintenance of monoecy and dioecy in *Sagittaria latifolia* (Alismataceae). Evolution 56: 31-41

In preparation:

Schmid, K., M.J. Rubin and **J. Friedman**. The effects of genetic and environmental variation on growth and flowering. To be submitted to Journal of Evolutionary Biology.

Book Reviews:

Invited review of: Approaches to Plant Evolutionary Ecology, by G. P. Cheplick. The Quarterly Review of Biology, 2017.

INVITED TALKS

Evolution of Plant Reproductive Systems: From Muddy Boots to Genomics. Toronto, Canada. August 2018
Botany Symposium: The Role of Boundaries in Plant Diversification. Fort Worth. June 2017
New York State Biotechnology Symposium, 9th Annual. SUNY ESF, May 2017
microMORPH, Developmental Basis of Evolutionary Innovation, Harvard, March 2017
University of Kentucky, Department of Biology. January 2017.
Queen's University. Department of Biology. October 2016.
American Genetics Association Symposium: Genetics of Local Adaptation. Asilomar July 2016.
British Columbia Nature Annual General Meeting. Comox, BC. May 2016.
Harvard University. Arnold Arboretum. February 2015.
Binghamton University. Department of Biology. November 2014.
Novel Traits and Rapid Evolution Conference, Cornell University. May 2013.
Cornell University. Department of Plant Biology. March 2013.
University of Southern Mississippi. Department of Biology. February 2013.

University of Vermont, Department of Plant Biology. November 2012.
Syracuse University, Department of Biology. January 2011.
Duke University, Department of Biology. April 2010.
North Carolina State University, Department of Plant Sciences. November 2009.
University of Toronto, Department of Ecology and Evolutionary Biology. May 2009.

PRESENTED PAPERS

Friedman, J. Evolutionary divergence between annual and perennial life history strategies. Botany Conference. Fort Worth, TX. June 2016.

Friedman, J. The evolution of reproductive strategies in annual and perennial plants. American Genetics Association President's Symposium. Asilomar, CA. July 2016.

Rubin, M.J., and J. Friedman. Seed environment affects germination and flowering timing in *Mimulus guttatus*. Evolution Conference, TX. June 2016.

Schmid, K., and J. Friedman. Intrapopulation genetic variation for flowering and growth in response to photoperiod. Evolution Conference, TX. June 2016.

Friedman, J. *Mimulus* – Diversity and Genetics. British Columbian Nature Conservancy Annual General Meeting. Comox Valley, B.C. May 2016.

Rubin, M. J., and J. Friedman. The role of cold cues on life history transitions in the *Mimulus guttatus* species complex. Plant Biology Conference, MN. July 2015.

Friedman, J. and J. Preston. Understanding the evolution and genetic basis of variation in vernalization in *Mimulus guttatus.* Society for the Study of Evolution Annual Meeting. Raleigh, NC. June, 2014.

Twyford, A.D. and J. Friedman. Life-history evolution and the role of a chromosomal inversion for ecotype divergence in *Mimulus guttatus.* Society for the Study of Evolution Annual Meeting. Raleigh, NC. June, 2014.

Friedman, J., A.D. Twyford, J.H.Willis, B.K. Blackman. Phenotypic and genetic trade-offs between flowering and vegetative growth in *Mimulus guttatus.* Society for the Study of Evolution Annual Meeting. Snow Bird, Utah. June, 2013.

Friedman, J. and J.H. Willis. Evolutionary genomics of life history strategies in *Mimulus guttatus*. Joint Congress on Evolutionary Biology. Ottawa, Canada. June, 2012.

Friedman, J. and J.H. Willis. Ecological genomics of complex traits in life history transitions in *Mimulus guttatus*. Duke University. October 2011.

Friedman, J. and J.H. Willis. Local adaptation and evolution of life-history changes in *Mimulus guttatus*. Society for the Study of Evolution Annual Meeting. Portland, Oregon. June, 2010.

Friedman, J. and S.C.H. Barrett. Genetic and environmental control of sex allocation and dichogamy in ragweed. Canadian Society for Ecology and Evolution Annual Meeting. Halifax, Nova Scotia. May, 2009.

Friedman, J. The evolution and ecology of wind pollination. Ecology and Evolution Department, University of Toronto. May, 2009.

Barrett, S.C.H., I. Stehlik and J. Friedman. Sex ratio variation in dioecious plant populations. Frontiers of Sexual Plant Reproduction III. Tucson, Arizona. October, 2008.

Barrett, S.C.H., I. Stehlik and J. Friedman. Environmental influence on primary sex ratio in a dioecious plant. Analogies in the Evolution of Gender Expression and Sexual Strategies in Animals and Plants. Neuhausen/Fildern, Germany. September, 2008.

Barrett, S.C.H., and J. Friedman. Ecology and evolution of wind pollination. The Ecology and Evolution of Plant-Pollinator Interactions. Milwaukee, Wisconsin USA. August, 2008.

Friedman, J. and S.C.H. Barrett. A phylogenetic analysis of the evolution of wind pollination. Canadian Society for Ecology and Evolution Annual Meeting. Toronto, Ontario. May, 2007.

Friedman, J. and S.C.H. Barrett. The consequences of monoecy for pollination and mating in wind-pollinated *Carex* (Cyperaceae). Society for the Study of Evolution Annual Meeting. Stony Brook, New York. June, 2006.

Friedman, J. The evolution and ecology of wind pollination. PhD Proposal Seminar. Department of Botany, University of Toronto. January, 2006.

Friedman, J.,and S.C.H. Barrett. Is wind pollination an inefficient process? Ontario Ecology and Ethology Colloquium. Ottawa, Ontario. May, 2005.

Friedman, J. On the ecology and evolution of wind pollination. Botany Graduate Students Seminar Series. Toronto, Ontario. April, 2005.

Friedman, J. Inflorescence architecture in grasses and the consequences for pollination. Ontario Ecology and Evolution Colloquium. Toronto, Ontario. May, 2004.

Friedman, J. and L.D. Harder. Wind pollination in grasses: the role of inflorescence architecture. Society for the Study of Evolution Annual Meeting. Chico, California. June, 2003.

Friedman, J. Wind pollination in grasses (Poaceae): Are they simply blowin' in the wind? Prairie Universities Biological Symposium. Calgary, Alberta. February, 2002.

Friedman, J. The evolution and maintenance of monoecy and dioecy in a plant species. Ecology Graduate Seminar Series. Calgary, Alberta. November 2000.

TEACHING

Instructor:
Evolutionary Genetics. Syracuse U. 2013-17. Advanced undergraduate/graduate.
Ecology and Evolution (Evolution portion). Syracuse U. 2015-16. Undergraduate.
Plant Biology. Syracuse U. 2016. Graduate
Biological Literature. Syracuse U. 2015. Graduate.
Evolutionary Mechanisms. Syracuse U. 2013-2014. Advanced undergraduate/graduate.
Sexual Selection and Mating Strategies. Syracuse U. 2014. Advanced undergraduate/graduate.
Comparing Sperm and Pollen Evolution. Syracuse U. 2014. Graduate.

Invited Lectures:
Experimental Ecology in S. Ontario, 2005-8. Field course guest lectures. U. of Toronto.
Quantitative Ecology, 2001. Size structured dynamics of pollen. U. of Calgary.

Teaching Assistant:
Environmental Biology, U. of Toronto. 2008. Redesign field and laboratory manual.
Environmental Biology, U. of Toronto, 2004-2008. Leading field trips, laboratories and marking.
Field Botany, U. of Toronto, 2007. Field course involving plant identification, vegetation analysis and independent projects.
Organisms in their Environment, U. of Toronto, 2004-2006. Tutorials, preparation and marking.
Evolutionary Biology, U. of Calgary, 2003. Tutorials, preparation and marking.
General Biology, U. of Calgary, 2000-2001. Lab preparation, instruction and marking.

Research Assistant:
Research Assistant (Dr S.C.H. Barrett), University of Toronto, 2000.
Field Research Assistant (Dr K.J. Esler), University of Stellenbosch, South Africa, 1999.
Research Assistant (Dr S.M. Smith), University of Toronto, 1998-1999.
Research Assistant (Dr R.I.C. Hansell) University of Toronto. 1997-1998.

ADVISING AND GRADUATE COMMITTEES

Post-doctoral advisees

2016-	Karine Leydet
2014-	Matthew Rubin
2012-2014	Alexander Twyford

Graduate students

2016	Abrar Aljiboury (rotation student)
2015	Reno Eckebrecht
2015	Christina Giovinazzo (rotation student)
2014-2016	Kelly Schmid (MSc)

Undergraduate researchers

2017-	Evan Surrick
2017-	Katherine Morris

2016-	Taylor Middleton
2015-2017	Genevieve Pilch
2014-2017	Anna Bjarvin
2015-2017	Lynjen Lu
2014-2015	Nick Conchieri
2014-2015	Jeff Darkwa
2014	Shahin Bazeli
2013-2015	Marcus Rivera
2013-2014	Katie Hart
2013-2014	Aaron Caola
2012-2013	Adam Isbiroglu

Graduate students' committees

PhD committee: Ryan Dunk, Kelly Schmid, Kelsey Martinez, Shengpei Wang, Kristin Haynes, Emma Whittington, Elizabeth Droge-Young, Brian Gress
MSc committee: Haley Plasman, Jessica McCordick
PhD examination committee: Andrew Siefert, Leanna Matthews
PhD candidacy examination committee: Irmak Erdem, Elise Hinman, Leanna Matthews

PROFESSIONAL AFFILIATIONS AND SERVICE

Committees and Service Positions

Review Committee for Departmental Chair, Syracuse U, 2016-2017
Chairs Advisory Committee, Department of Biology, Syracuse U, 2014-
Departmental Vision and Long-Term Planning Committee, Dept. of Biology, Syracuse U, 2014-
Greenhouse Committee, Department of Biology, Syracuse U, 2014-
Undergraduate Curriculum Committee, Department of Biology, Syracuse U. 2013-2014
Member of WiSE (Women in Science & Engineering) and Advance (Increasing the Participation and Advancement of Women in Academic Science and Engineering Careers, 2012-
Curriculum Review and Renewal Committee, Faculty of Arts and Science, U of Toronto – Graduate student representative, 2006-2007
Ombudsperson, Ecology and Evolution Graduate Students Association, U of Toronto 2006-2007
Botany Dept Seminar Committee – Graduate student representative, U of Toronto 2005-2006
Ombudsperson, Botany Graduate Students Association, U of Toronto 2005-2006
President, Botany Graduate Students Association, U of Toronto 2004-2005
Functional Plant Ecology Assistant Professor – search committee, Graduate student representative, U of Toronto 2004-2005
Faculty of Science Women's Network, U of Toronto 2002-2003
Biological Sciences Representative, Graduate Students Association, U. of Calgary, 2001-2002
Ecology Assistant Professor, U. of Calgary graduate students' hiring committee, 2003
Population Ecology Assistant Professor, U. of Calgary graduate students' hiring committee, 2002

Associate Editor

American Journal of Botany

External Reviewer
Journals: American Journal of Botany, American Naturalist, Australian Journal of Botany, Axios Review, Botany, Central European Journal of Biology, Ecology, Evolution, Functional Ecology, Genetics, International Journal of Plant Sciences, Journal of Ecology, Journal of Theoretical Biology, Molecular Ecology, Molecular Phylogenetics and Evolution, New Phytologist, Oecologia, Plant Biology, Plant Species Biology, PLoS Genetics, PLoS One, Sexual Plant Reproduction.

*Grants***:** NSF GRFP Panel 2014
(*ad-hoc* reviewer): National Science Foundation Dimensions of Biodiversity Program, Molecular and Cell Biology Program, Plant Genome Research Program, Research Initiation Award Program; Swiss National Science Foundation; M.J. Murdock Charitable Trust; Graduate Women in Science Fellowship.

Society Membership
American Society of Naturalists, Botanical Society of America, Society for the Study of Evolution