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## Sarah J. Baldwin

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### EDUCATION

- 2013 – *pres.* McGill University, PhD in the Department of Biology with Dan Schoen.  
*Thesis: Why does self-incompatibility persists in natural plant populations*  
Defense June 2023 and convocation October 2023
- 2009 – 2011 University of Guelph, MSc in Integrative Biology with Brian Husband.  
*Thesis: The association between polyploidy and clonal reproduction.*
- 2004 – 2009 University of Guelph, Honours Plant Biology with Brian Husband (2009).  
*Thesis: Genome duplication and the evolution of conspecific pollen precedence.*

### PEER-REVIEWED PUBLICATIONS

1. Schoen DJ, **Baldwin SJ**. 2023. Self-incompatibility and the genetic architecture of inbreeding depression. *New Phytologist* **237**: 1040-9 (co-first author)
2. **Baldwin SJ** and Schoen DJ. 2019. Inbreeding depression is difficult to purge in self-incompatible *Leavenworthia alabamica*. *New Phytologist* **224**: 1330-1338.
3. **Baldwin SJ** and Schoen DJ. 2017. Genetic variation for pseudo self-compatibility in self-incompatible populations of *Leavenworthia alabamica* (Brassicaceae). *New Phytologist*, **213**: 430-439.
4. Husband BC, **Baldwin SJ**, and Sabara HA. 2016. Direct versus indirect effects of whole genome duplication on pre-zygotic isolation in *Chamerion angustifolium*: implications for rapid speciation. *American Journal of Botany* **103**: 1259-1271.
5. **Baldwin SJ** and Husband BC. 2013. The association between polyploidy and clonal reproduction in diploid and tetraploid *Chamerion angustifolium*. *Molecular Ecology* **22**: 1806–1819. (Cover article)
6. Husband BC, **Baldwin SJ** and Suda J. 2013. The Incidence of Polyploidy in Natural Plant Populations: Major Patterns and Evolutionary Processes. In Leitch, I. J., Greilhuber, J., Dolezel, J., & J. F. Wendel (Eds.), *Plant Genome Diversity Volume 2*: 255–276.
7. **Baldwin SJ**, & Husband BC. 2011. Genome duplication and the evolution of conspecific pollen precedence. *Proceedings of the Royal Society B* **278**: 2011-2017.

8. Bainard JD, Husband BC, **Baldwin SJ**, Fazekas AJ, Gregory TR, Newmaster SG and Kron P. 2011. The effects of rapid desiccation on estimates of plant genome size. *Chromosome Research* **19**: 825-842.

## TEACHING

### FULL-TIME TEACHING APPOINTMENT

BIOL-3911, Plants and Human Society, Mount Allison, Department of Biology (2020)

BIOL-3711, Biochemical Ecology, Mount Allison, Department of Biology (2020)

- For 3911 and 3711: I designed the lectures, assignments, and exams for these courses and marked all assignments and exams. I provided these courses in a hybrid format where half of my lectures were virtual, and half were in person (with option to participate virtually).

### SESSIONAL LECTURER

BIOL-1001, Foundations of Biology, Mount Allison, Department of Biology (2020)

- I designed weekly lectures, textbook readings, weekly quizzes, two midterms and final exam. I marked all midterms, quizzes, and exams. I transitioned to teach the last few weeks online (including an online exam) because of the COVID-19 pandemic.

### TEACHING ASSISTANTSHIPS (1,500 hours total)

BIOL 202 *Introductory Genetics*, with Dan Schoen, McGill University, Quebec, Canada

- I designed questions for weekly problem sets and led weekly problem-solving labs
- Years: 2013, 2014, 2015, 2016

BIOL 373 *Biometry*, with Brian Leung, McGill University, Quebec, Canada

- I led weekly statistical labs in R and marked weekly assignments, labs, and exams
- Years: 2013, 2014

BIOL 2400 *Evolution*, with Teresa Crease, University of Guelph, Ontario, Canada

- Tutored students in writing essays, marked essays, helped students with problems
- Years: 2010, 2011

DTM 3000 *Turf Management II*, with Eric Lyons, University of Guelph, Ontario, Canada

- Led weekly applied labs where I taught students the fundamentals of nutrient, drainage, and pest management in human-modified turf landscapes
- Year: 2009

### INSTRUCTION OUTSIDE UNIVERSITY COURSES

2019 Assistant Instructor. Mad Science of the Maritimes

Provided extra-curricular science education for children (K to grade 5)

2017 Instructor, *International Genomics Workshop*, Cesky Krumlov, Czech Republic

## Sarah J. Baldwin - CV

I was invited to modify and implement a 2-week bioinformatics course for over 80 participants.

- 2017 *Mental Health in Graduate School*, CEEB (Conservation, Ecology, Evolution, and Behaviour) Retreat, McGill University, Quebec, Canada  
I independently developed and led this wellness workshop.

### GUEST LECTURES

- 2019 Adaptations! Guest speaker for Mad Science Maritimes, Summer Science Camp  
2014 Using simulations to create null models, Biometry, McGill University, Quebec, Canada  
2013 Using simulations to create null models, Biometry, McGill University, Quebec, Canada  
2009 Fundamentals of plant nutrition, 3<sup>rd</sup> year Turf Management, University of Guelph

### OTHER WORK EXPERIENCE

- 2023 Chief Scientific Officer, Sarah Baldwin Analytics.  
*I provide collaborative research services to organizations that wish to use DNA to monitor ecologically or economically significant species.*
- 2020 Mount Allison University, Research Assistant with Emily Austen
- 2008-2009 University of Guelph, Research Assistant with Brian Husband (included collaborations with Jillian Bainard and Ryan Gregory).  
*Topic: The effect of tissue desiccation on estimates of plant genome size.*
- 2007 Royal Botanical Gardens, Student Field Botanist in the Department of Science with Natalie Iwanycki and David Galbraith.  
*Topic: The health of native and invasive mulberry populations.*
- 2007 Seasonal Sales Associate, Harper's Garden Centre, Ancaster, ON
- 2006 Seasonal Sales Associate, TERRA Greenhouses, Waterdown, ON

### UNDERGRADUATE STUDENT SUPERVISION

- 2020 Mount Allison University, New Brunswick, Canada  
*Worked in Emily Austen's Lab the summer of 2020 with Ròisìn Kierstead. Worked alongside Ròisìn, teaching her how to make sterile plates of growth media, sterilizing seeds, and monitoring plant growth across several environmental treatments.*
- 2013 – 2019 McGill University, Quebec, Canada  
*Andrew Matheson (experimental crosses and pollen tube growth analysis), Eric Vaughan (long term selection experiment), and Megan Roda (developing population genetic models in R and pollen tube microscopy: NSERC USRA funded. This resulted in her first publication: Schoen and Roda, 2016 Evolution)*
- 2010 – 2012 University of Guelph, Ontario, Canada  
*Alexandra Weath (flow cytometry and morphological measurements), Lindsay Vyvey (DNA extractions), Alena Mamonne (flow cytometry), Rebecca Hay*

- (*morphological measurements for colchicine experiments*), Meghan Bertenshaw (*root bud morphology and DNA extractions: NSERC USRA funded*)
- 2010 Biogeoscience Institute: Barrier Lake field station, University of Calgary, Alberta, Canada  
*Lindsay Wilson (setting up field experiments, pollinator observations, stomata size microscopy) and Laura Kaupas (recording data from field experiments)*

## PRESENTATIONS

### ORAL PRESENTATIONS

- Baldwin SJ** and Schoen DJ. 2019. Inbreeding depression is difficult to purge in self-incompatible populations of *Leavenworthia alabamica*. Canadian Society for Ecology and Evolution Meeting, Fredericton, New Brunswick, Canada.
- Baldwin SJ** and Schoen DJ. 2017. The genomics of purging inbreeding depression. Canadian Society for Ecology and Evolution Meeting, Victoria, British Columbia, Canada.
- Baldwin SJ** and Schoen DJ. 2016. Genetic diversity for pseudo self-compatibility in *Leavenworthia alabamica*. McGill CEEB Retreat (Conservation, Evolution, Ecology and Behaviour group), Gault Nature Reserve, Quebec, Canada. \*Award for Best Speed Talk
- Baldwin SJ** and Schoen DJ. 2016. Using Rad-Seq to detect segregation distortion in experimental populations. Population Variation Genetics: Experimental Strategies and Analysis, The Genome Analysis Centre (TGAC), Norwich, UK. \*competitive admission
- Baldwin SJ** and Schoen DJ. 2015. Heritability of self-incompatibility in a self-incompatible plant: *Leavenworthia alabamica*. Quebec Center for Biodiversity Sciences, Montreal, Canada.
- Baldwin SJ** and Husband BC. 2013. The association between clonality and polyploidy in the herbaceous plant, *Chamerion angustifolium* (Onagraceae). 1<sup>st</sup> Joint Congress on Evolutionary Biology. Ottawa, Canada.
- Baldwin S.** and Husband BC. 2009. Siring success and polyploidy evolution in *Chamerion angustifolium*. Ontario Ecology and Ethology Colloquium. Kingston, Ontario, Canada.

### POSTER PRESENTATIONS

- Baldwin SJ** and Schoen DJ. 2014. Self-compatible mutants in self-incompatible populations of *Leavenworthia alabamica*. Genomes to/aux Biomes, Canadian Society for Evolution and Ecology, Montreal, Quebec, Canada
- Baldwin SJ** and Schoen DJ. 2013. The effect of genome duplication on the phenotype and gene expression of sporophytic self-incompatibility. Quebec Center for Biodiversity Sciences Symposium, Montreal, Quebec, Canada
- Baldwin SJ** and Husband BC. 2011. The association between polyploidy and clonality in the perennial plant *Chamerion angustifolium*. 13th Congress of the European Society for Evolutionary Biology, Tübingen University, Germany. \*Competitive admission

## SCHOLARSHIPS, FELLOWSHIPS, AND AWARDS

- 2018 Nominee, “Award for Equity and Community Building,” McGill University,  
For: BGSA Department Day (alongside Emma Hudgens, Logan Smith, and Michelle Gros)
- 2018 Nominee, “Best Academic Event,” Post Graduate Student Society, McGill University  
For: BGSA Department Day (alongside Emma Hudgens, Logan Smith, and Michelle Gros)
- 2017 The 1<sup>st</sup> annual Diversity and Equity Award, McGill Biology Department (by vote)
- 2017 GREAT Travel Award, McGill Biology Department: \$500
- 2017 Student Travel Award, Canadian Society for Ecology and Evolution: \$500
- 2017 Writing-Year Award Scholarship, McGill Biology Department: \$6000
- 2016 Best Speed Talk: Conservation, Ecology, Evolution, Behaviour Retreat: \$25
- 2016 Science Excellence Award, Quebec Centre for Biodiversity: \$1,876
- 2016 Research Travel Award, McGill University: \$2,000
- 2016 Molson Hilton Hart Fellowship: \$5,400
- 2015 PhD Fellowship, Fonds de Recherche du Quebec: Nature et Technologies: \$13,332
- 2013 Research Travel Award, McGill Biology Department: \$1,750
- 2013 PhD Entrance Award, McGill Biology Department: \$5,000
- 2008 Convocation Award, Faculty Nominated, Ontario Agricultural College, University of Guelph (Declined)
- 2008 Best Science Exhibit: ‘Plant Biology Club,’ College Royal, University of Guelph
- 2004 Award for most hours volunteered, Reach for the Rainbow, YMCA Wanakita

## ACADEMIC SERVICE

### EVENT DEVELOPMENT

- 2016 – 2017 Department Day Symposium Organizer. I helped to reinvent our department day as a tool for community building and to foster collaboration across this department. This stems from problems identified in the Departmental Cyclical Review (2014-15) that I was involved in. I introduced an annual Equity and Diversity workshop. We collaborated with the Social Equity and Diversity Education Office at McGill to design a workshop specific to the needs of the McGill Biology Department. We were nominated for two awards. One from our graduate student union (PGSS), and one that was university-wide at McGill University.

### COMMITTEES

- 2014 –2018 Graduate student representative, Graduate Training Committee, McGill Biology Department.

- 2016 – 2017 Graduate student representative and founding member, Communications Committee, McGill Biology Department
- 2015 – 2016 Secretary, Biology Graduate Student Association, McGill Biology Department
- 2014 – 2015 Graduate student coordinator, Cyclical Review, McGill Biology Department
- 2007 – 2008 Vice President, Plant Biology Club, University of Guelph
- 2010 – 2012 Seminar Coordinator, Integrative Biology Department, University of Guelph
- 2003 – 2004 Communications Committee, Ancaster High School

#### JOURNAL AND DISCUSSION GROUPS

- 2016 – 2018 CEEB (Conservation, Ecology, Evolution, and Behaviour) Journal Club, McGill University
- 2015 – 2017 Genomics Discussion Group, McGill University (Founder)
- 2014 – 2016 Statistics-Biology Exchange Group, McGill University
- 2009 – 2012 Flow Cytometry Discussion Group, University of Guelph
- 2010 – 2011 Evolutionary Biology Journal Club, University of Guelph
- 2005 – 2006 Academic Cluster Leader (Biology), Lambton Hall, University of Guelph

#### JOURNAL REVIEWER

I have reviewed manuscripts for the following journals:

- *American Journal of Botany*
- *Botanical Journal of the Linnean Society*
- *Ecology and Evolution*
- *Evolution*
- *International Journal of Plant Research*
- *AoB Plants*
- *Molecular Ecology Resource*

#### BIOINFORMATIC EXPERIENCE

I have personally worked with HIGH-seq data, Sanger and fragment length data, and Oxford Nanopore sequence data. I implement most of my analyses with UNIX shell scripting or in R. I have extensive experience teaching and using R for bioinformatics and statistical analyses, including executing programs or designing functions and simulations. I have some experience with version control systems and SQL databases. Most of my larger analyses have been done in the cloud where I have built virtual machines with different characteristics depending on my needs. All of my research involves high throughput data with high sample sizes. Much of my statistical training comes from the Human Genomics department at McGill (Dr. Cecelia Greenwood was my instructor) and focused on the analysis of human data. A list of programs that I have included in my pipelines can be produced upon request.