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PROFESSIONAL APPOINTMENTS

2017- Assistant Professor, Department of Botany and Plant Pathology, Purdue University

2011-2016 Postdoctoral Research Associate, Department of Plant Biology, Michigan State University

EDUCATION

2011 Ph.D. Biological Science (Ecology and Evolution), Florida State University
2005 M.S. Biological Science (Ecology and Evolution), Florida State University
1998 B.S. Botany, University of Washington

GRANTS

2018 Purdue Center for Plant Biology Seed Grant: "Genetic and physiological mechanisms underlying genotype by environment interactions for fitness" (PI, $50,000, with Co-PI Brian Dilkes)

2017-2019 NSF DEB-1556262 (transfer of 1743273): "Evolutionary genetics of adaptation in natural populations of *Arabidopsis thaliana*" (PI, $646,000, with Co-PI's Doug Schemske and Mike Thomashow, MSU and John Mckay, CSU)

2016-2017 NSF DEB-1743273: "Evolutionary genetics of adaptation in natural populations of *Arabidopsis thaliana*" (Co-PI, $980,000, with PI Doug Schemske and Co-PI's Mike Thomashow, MSU and John Mckay, CSU)

2010 Florida Native Plant Society Endowment Research Grant, "Can among population variation in mating system explain patterns of adaptive genetic diversity in the endangered endemic *Hypericum cumulicola*" (PI, $2,500)

2008-2010 NSF Doctoral Dissertation Improvement Grant (DDIG), DEB-0808435: The effects of drift and gene flow on adaptive potential in a structured plant population" (Co-PI, $12,000)

AWARDS and FELLOWSHIPS

2015 Anton Lang Memorial Research Excellence Award, Michigan State University
2009 Margaret Y. Menzel Scholarship, Florida State University
2008 Dissertation Research Grant, Florida State University
2003 Robert K. Godfrey Scholarship, Florida State University
2001 Presidential Research Fellowship, Florida State University

DRAFTED and SUBMITTED MANUSCRIPTS

Oakley, C.G., S. Lundemo, J. Ågren, and D.W. Schemske. Heterosis predominates in crosses between natural populations of *Arabidopsis thaliana.* Evolution. *In review.*

PUBLICATIONS (PEER REVIEWED)

Price, N., B.T. Moyers, L. Lopez, J.R. Lasky, G. Monroe, J.L. Mullen, **C.G. Oakley**, J. Lin, J. Ågren, D.R. Schrider, A.D. Kern, and J.K. McKay. Combining population genomics and fitness QTLs to identify the genetics of local adaptation in *Arabidopsis thaliana*. Proceedings of the National Academy of Sciences, USA. 115:5028-5033.

Oakley, C.G., L. Savage, S. Lotz, R. Larson, M.F. Thomashow, D.M. Kramer, and D.W. Schemske. 2018. Genetic basis of photosynthetic responses to low temperature in locally adapted populations of *Arabidopsis thaliana*. Journal of Experimental Botany 69:699-709.

Ågren, J., **C.G. Oakley**, S. Lundemo, and D.W. Schemske. 2017. Adaptive divergence in flowering time among natural populations of *Arabidopsis thaliana:* QTL mapping and estimates of selection. Evolution 71:550-564.

Mojica, J.P., J. Mullen, J.T. Lovell, G. Monroe, J. Paul, **C.G. Oakley**, and J.K. McKay. 2016. Genetics of water use physiology in locally adapted *Arabidopsis thaliana*. Plant Science. 251:12-22.

Dittmar, E.D.*, **C.G. Oakley***, J.K. Connor, B.A. Gould, and D.W. Schemske. 2016. Factors influencing the effect size distribution of adaptive substitutions. Proceedings of the Royal Society B: Biological Sciences. 283:20153065. ***co-first authors.**

Oakley, C.G., J. P. Spoelhof, and D.W. Schemske. 2015. Increased heterosis in selfing populations of a perennial forb. AoB Plants 7: plv122

Oakley, C.G., J. Ågren, and D.W. Schemske. 2015. Heterosis and outbreeding depression in crosses between natural populations of *Arabidopsis thaliana.* Heredity 115: 73-82.

Oakley, C.G. 2015. The influence of natural variation in population size on ecological and quantitative genetics of the endangered endemic plant *Hypericum cumulicola*. International Journal of Plant Sciences 176:11-19.

Oakley, C.G., J. Ågren, R.A. Atchison, and D.W. Schemske. 2014. QTL mapping of freezing tolerance: links to fitness and adaptive trade-offs. Molecular Ecology 23: 4304-4315.

Dittmar, E., **C.G. Oakley**, J. Ågren, and D.W. Schemske. 2014. Flowering time QTL in natural populations of *Arabidopsis thaliana* and implications for their adaptive value. Molecular Ecology 23: 4291-4303.

Ågren, J., **C.G. Oakley**, J.K. McKay, J.T. Lovell, and D.W. Schemske. 2013. Genetic mapping of adaptation reveals fitness trade-offs in *Arabidopsis thaliana.* Proceedings of the National Academy of Sciences, USA 110: 21077-21082.

Oakley, C.G. 2013. Small effective size limits performance in a novel environment. Evolutionary Applications 6: 823-831.

Oakley, C.G. and A.A. Winn. 2012. Effects of population size and isolation on heterosis, mean fitness, and inbreeding depression in a perennial plant. New Phytologist 196: 261-270.

Oakley, C.G. and A.A. Winn. 2008. Population and family level inbreeding depression in the cleistogamous perennial *Viola septemloba*. International Journal of Plant Sciences169: 523-530.

Oakley, C.G., K.S. Moriuchi, and A.A. Winn. 2007. The maintenance of outcrossing in predominantly selfing species: ideas and evidence from cleistogamous species. Annual Review of Ecology, Evolution, and Systematics 38: 437-457.

PUBLICATIONS (NON-PEER REVIEWED)

Oakley, C.G. 2015. The genetic consequences of small population size in the endangered plant *Hypericum cumulicola* (Small) P.B. Adams (Hypericaceae). Palmetto: The Quarterly Journal of the Florida Native Plant Society 31: 4-7.

INVITED PRESENTATIONS

Genetic and physiological mechanisms of fitness tradeoffs across environments. Purdue Center for Plant Biology Brown Bag Seminar Series. Purdue University, West Lafayette, IN. May 23, 2018.

The genetic basis of local adaptation and fitness tradeoffs in a widespread annual plant. Earlham College, Richmond, IN. March 8, 2018.

The genetic basis of local adaptation and fitness tradeoffs in a widespread annual plant. Purdue University, Department of Biology, West Lafayette, IN. September 27, 2017.

The genetic basis of local adaptation in Arabidopsis. University of Illinois, Chicago, IL. July 28, 2017.

The genetic basis of local adaptation and fitness tradeoffs. Purdue University Plant Science Symposium, West Lafayette, IN. February 3, 2017.

The genetic basis of local adaptation and adaptive traits in natural populations of *Arabidopsis*. Purdue University, Department of Botany and Plant Pathology, West Lafayette, IN. February 15, 2016.

The genetic basis of freezing tolerance and local adaptation in *Arabidopsis*. "From Darwin to Bourlag", a joint symposium of the Donald Danforth Plant Science Center and the Missouri Botanical Garden. St. Louis, MO. October 9, 2015.

The genetic basis of adaptation and the constraints imposed by genetic drift. Ohio University, Athens, OH. January 26, 2015.

The genetic basis of adaptation and the constraints imposed by genetic drift. Georgia Southern University, Statesboro, GA. January 10, 2015.

The genetic basis of adaptation and the constraints imposed by genetic drift. Penn State University, State College, PA. December 16, 2014.

Drift shapes genetic variation relevant to fitness in natural populations. W. K. Kellogg Biological Station, Hickory Corners, MI. February 1, 2013.

The effect of population size on mutation load and response to a novel environment in an endangered plant. Michigan State University, East Lansing, MI. October 10, 2012.

The effect of spatial population structure on adaptive genetic variation in a perennial plant. Archbold Biological Station, Lake Placid, FL. March 8, 2011.

Ecological genetics of *Hypericum cumulicola*. Florida Rare Plant Task Force. Lake Wales, FL. April 28, 2010.

RECENT CONFERENCE PRESENTATIONS

The genetic basis of local adaptation and fitness tradeoffs. **Oakley, C.G.,** J. Ågren, and D.W. Schemske. *Oral presentation:* Society for the Study of Evolution, Austin, TX. June 20, 2016.

Fitness trade-offs and the ecological genetics of adaptation. **Oakley, C.G.,** J. Ågren, and D.W. Schemske. *Oral presentation:* Society for the Study of Evolution, Snowbird, UT. June 25, 2013.

Heterois in crosses between natural populations of *Arabidopsis thaliana*. **Oakley, C.G.** *Oral presentation:* Joint Congress of the Society for the Study of Evolution and the European Society for Evolutionary Biology. Ottawa, Canada. July 8, 2012.

The effect of spatial population structure on patterns of adaptive trait variation in a rare perennial plant. **Oakley, C.G.** *Oral presentation:* Society for the Study of Evolution, Portland, OR. June 28, 2010.

MENTORING:

Postdoctoral scholars

2017- Kattia Palacio-López (Purdue University): Genetic and physiological mechanisms of freezing tolerance.

Graduate students

2018- Joshua C. Kraft (Ph.D. Student, Purdue University): Genetic basis of adaptive traits.

Undergraduate independent research

2018 Juan Diego Rojas Gutierrez (visiting student from Universidad ICESI, Cali, Colombia): Natural variation in salinity tolerance in *Arabidopsis thaliana*

2018 Rebecca Deater (Biology, Purdue University): Genetics and ecology of mixed mating systems via chasmogamous and cleistogamous reproduction in *Ruellia*.

2017 Alex Dowden (BTNY498, Purdue University): Fine-mapping a freezing tolerance QTL.

2012 Cristina Zambrana-Echevarría (Plant Genomics REU, MSU): Gene expression variation and heterosis in the freezing tolerance of *Arabidopsis thaliana* populations.

2011 Teresa Bohner (Biology, FSU): Population differentiation for floral traits associated with self-fertilization in *Hypericum cumulicola*.

2010 Miriam Ojima (FSU Teach intern): Inter- and intra-specific interactions affecting germination and seedling establishment in *Hypericum cumulicola*.

2010 Mary Grace Shuster (FSU Teach intern): Population differentiation for germination timing and root:shoot allocation in *Hypericum cumulicola*.

TEACHING

2018- I currently teach Plant Ecology (BTNY 302) at Purdue University. This is a 3 credit combined lecture and lab course targeted Junior undergraduates, and is offered every spring semester. We cover the full range of topics in plant ecology, but with an emphasis on physiological and population ecology. We also cover the application of plant ecology principles to biodiversity conservation and invasive species management.

PEER REVIEWER

Ad Hoc Reviewer for National Science Foundation (NSF) DEB, American Journal of Botany, American Naturalist, Annals of Botany, AoB Plants, Axios review, Botany, Caribbean Journal of Science, Castañea, Conservation Genetics, Ecography, Ecology, Evolution, Evolution Letters, Genes Genomes Genetics, International Journal of Plant Sciences, Journal of Ecology, Journal of Experimental Botany, Journal of Heredity, Journal of the Torrey Botanical Society, Molecular Ecology, Nature Communications, New Phytologist, PLoS One, PNAS, and Rhodora

PROFESSIONAL MEMBERSHIPS

Botanical Society of America
Society for the Study of Evolution

OUTREACH and BROADER IMPACTS

2016	Partnered with the W. K. Kellogg Biological Station GK-12 programs and obtained funding (NSF) to develop an inquiry based lesson plan supporting Next Generation Science Standards for high school teachers. Hosted two high school teachers who developed the lesson plan and presented it at the GK-12 Summer Institute at Kellogg Biological Station. Distributed the lesson plan and complete kits containing all necessary materials to seven local high school teachers. Developed a data nugget (http://datanuggets.org/2016/10/winter-is-coming/) entitled “Winter is coming! Can you handle the freeze?” which will allow students to develop quantitative skills and answer scientific questions using real freezing tolerance data from a large collection of natural populations.
2013-Present	Planting Science: Scientist mentor for inquiry based learning project that pairs scientist mentors with teachers and groups of K-12 students conducting experiments in plant biology