

Caiti Smukowski Heil

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EDUCATION

University of Pennsylvania, Biology; B.A. 2009
Duke University, Biology, minor in Genetics; Ph.D. 2014

ACADEMIC APPOINTMENTS

Assistant Professor, North Carolina State University, Department of Biological Sciences 2019
Senior Fellow, University of Washington, Department of Genome Sciences 2014-2018

PUBLICATIONS

- Smukowski Heil, C.**, C.R. Large, C. Yeh, A. Hickey[#], K. Patterson[#], M.J. Dunham. Temperature preference biases parental genome retention during hybrid evolution. *bioRxiv* doi: <https://doi.org/10.1101/429803>
[#]undergraduate
- Lancaster, S.M., C. Payen, **C. Smukowski Heil**, M. J. Dunham. Fitness benefits of loss of heterozygosity in *Saccharomyces* hybrids. *bioRxiv* doi: <https://doi.org/10.1101/452748>
- Smukowski Heil, C.***, J.N. Burton*, I. Liachko*, A. Friedrich, N.A. Hanson, C.L. Morris, J. Schacherer, J. Shendure, J.H. Thomas, M.J. Dunham. 2018. Identification of a novel interspecific hybrid yeast from a spontaneously inoculated beer sample using Hi-C. *Yeast* 35:71–84. doi:10.1002/yea.3280 *co-first authors
- Hope E.A., C.J. Amorosi, A.W. Miller, K. Dang[#], **C. Smukowski Heil**, M.J. Dunham. 2017. Experimental evolution reveals favored adaptive routes to cell aggregation in yeast. *Genetics* 206 (2):1153-1167. doi: 10.1534/genetics.116.198895 [#]undergraduate
- Smukowski Heil, C.**, C.G. DeSevo, D.A. Pai, C.M. Tucker, M.L. Hoang, M.J. Dunham. 2017. Loss of heterozygosity drives adaptation in hybrid yeast. *Molecular Biology and Evolution* 34 (7):1596-1612. doi:10.1093/molbev/msx098
- Smukowski Heil, C.**, C. Ellison, M. Dubin, and M.A.F. Noor. 2015. Recombining without hotspots: A comprehensive evolutionary portrait of recombination in two closely related species of *Drosophila*. *Genome Biology and Evolution*. doi: 10.1093/gbe/evv182
- Smukowski Heil, C.** 2014. No detectable effect of the DNA methyltransferase DNMT2 on *Drosophila* meiotic recombination. *G3: Genes, Genomes, Genetics*, 4 (11): 2095-2100. doi:10.1534/g3.114.012393
- Heil, C.S.**, B. Manzano-Winkler, M.J. Hunter, J.K.F. Noor, and M.A.F. Noor. 2013. Witnessing Evolution First-hand: A K-12 Laboratory Exercise in Genetics and Evolution Using *Drosophila*. *American Biology Teacher*, 75: 116-119. doi:10.1525/abt.2013.75.2.8
- Heil, C. S.**, M.J. Hunter, J.K.F. Noor, K. Miglia, B. Manzano-Winkler, S.R. McDermott, and M.A.F. Noor. 2012. Witnessing phenotypic and molecular evolution in the fruit fly. *Evolution: Education and Outreach*, 5: 629-634. doi:10.1007/s12052-012-0447-5
- Heil, C.S.**, and M.A.F. Noor. 2012. Zinc finger binding motifs do not explain recombination variation within or between species of *Drosophila*. *PLoS One*, 7: e45055. doi:10.1371/journal.pone.0045055
- McGaugh, S.E., **C.S. Heil**, B. Manzano-Winkler, L. Loewe, S. Goldstein, T.L. Himmel, M.A.F. Noor. 2012. Recombination modulates how selection affects linked sites in *Drosophila*. *PLoS Biology*, 10: e1001423. doi:10.1371/journal.pbio.1001422

Smukowski, C., and M.A.F. Noor (2011). Recombination rate variation in closely related species. *Heredity* 107(6): 496-508. doi:10.1038/hdy.2011.44

Other writing

Smukowski Heil, C. S., and M. A. F. Noor. 2013. Studying recombination with high-throughput sequencing: An educational primer for use with "Fine-scale heterogeneity in crossover rate in the *garnet-scalloped* region of the *Drosophila melanogaster* X chromosome." *Genetics* 194: 395-399. doi: 10.1534/genetics.113.150771

Noor, M. A. F., and **C. S. S. Heil.** 2012. Mentor vs. Monolith: Finding and being a good graduate advisor. *American Scientist*, 100: 450-453 doi:10.1511/2012.99.450

FELLOWSHIPS, GRANTS, & AWARDS

2018-2019	University of Washington Royalty Research Fund
2018	Genetics Society of America DeLill Nasser Award for Professional Development in Genetics
2017	BEACON Travel Award
2014-2016	National Institutes of Health Genome Sciences Training Grant, <i>competitive</i>
2016	BEACON Travel Award
2015	BEACON Travel Award
2012-2014	National Science Foundation Doctoral Dissertation Improvement Grant
2011-2014	National Science Foundation Graduate Research Fellowship
2010	SSE Rosemary Grant Graduate Student Research Award
2010	Summer Institute for Statistical Genetics Travel Scholarship
2010	Sigma Xi Grant in Aid of Research
2009-2013	James B. Duke Fellowship

INVITED SEMINARS

2018	Genome evolution and adaptation in hybrids. North Carolina State University.
2018	Genome evolution and adaptation in hybrids. Oregon State University.
2018	Genome evolution and adaptation in hybrids. University of Alaska Anchorage.
2017	Genome evolution and adaptation in hybrids. Arizona State University.
2016	Genome evolution following interspecific hybridization. Western Washington University.
2013	The causes of recombination rate variation. University of Washington.
2013	Patterns of meiotic recombination across model organisms. Eastern Carolina University.

CONFERENCE PRESENTATIONS: ORAL* & POSTER

2018	To TE, or not to TE, that is the question: transposable element dynamics in hybrid genomes. Genetics Society of America Population, Evolutionary, and Quantitative Genetics Meeting. Madison, WI
2017*	Brrr and beer: Cold adaptation in hybrid yeast. Society for the Study of Evolution Meeting. Portland, OR
2016*	When two genomes become one: a tale of love, loss, and redemption. Society for the Study of Evolution Meeting. Austin, TX
2015*	Transposable elements contribute to rapid adaptation in hybrids. Society for Molecular Biology and Evolution. Vienna, Austria
2013	Past vs. Present: How well do LD-based linkage maps reflect present-day measures of recombination? Society for Molecular Biology and Evolution Meeting. Chicago, IL

- 2013* Past vs. Present: How well do LD-based linkage maps reflect present-day measures of recombination? Society for the Study of Evolution Meeting. Snowbird, UT
- 2012 Sequence features do not mediate changes in recombination rate within or between species of *Drosophila*. American Genetics Association. Durham, NC
- 2012 Zinc finger genes, binding motifs, and recombination in *Drosophila*: Shattering the mammalian *Prdm9* paradigm. Genetics Society of America *Drosophila* Conference. Chicago, IL
- 2011 Molecular Evolutionary Consequences of Recombination Rate Variation. American Genetics Association. Guanajuato, Mexico
- 2011* Conservation and divergence of recombination rate in *Drosophila miranda* and its close relatives. Society for the Study of Evolution Meeting. Norman, OK

LOCAL SEMINARS

- 2018 Transposable element dynamics in hybrid genomes. Genome Sciences Postdoctoral Seminar series, University of Washington.
- 2017 Jumping into new genomes? Introducing transposable elements into a genome that lacks them. MolEvolve Chalk Talk series, University of Washington.
- 2017 Transposable elements in hybrid yeast. Genome Sciences Population Genetics seminar, University of Washington.
- 2017 Loss of heterozygosity drives adaptation in hybrid yeast. Genome Sciences Postdoctoral Seminar series, University of Washington.
- 2016 When two genomes become one: a tale of love, loss, and redemption. Genome Sciences Postdoctoral Seminar series, University of Washington.
- 2016 When two genomes become one: a tale of love, loss, and redemption. BEACON seminar, University of Washington.
- 2016 Genome evolution in interspecific yeast hybrids. Bread Lab Symposium, University of Washington.
- 2015 Genome evolution in interspecific yeast hybrids. Biology Department Evolution and Systematics seminar, University of Washington.
- 2015 Genome evolution in interspecific hybrids. Genome Sciences Postdoctoral Seminar series, University of Washington.
- 2014 The causes and consequences of recombination rate variation. Genome Sciences Population Genetics seminar, University of Washington.
- 2013 The birds and the bees, the flowers and the trees, ... and *Drosophila*: Recombination in context. Population Biology Seminar, Duke University.
- 2013 The recombination landscape of *Drosophila*. Fly Club, Duke University.
- 2012 Sequence motifs and recombination rate variation: the fruit (fly) falls far from the mammalian tree. Population Biology Seminar, Duke University.
- 2011 Evolution of Recombination. Population Biology Seminar, Duke University.

TEACHING

- 2018 Instructor of Record, "How evolution shapes cancer: implications for a cure," Science Teaching Experience for Postdocs program, University of Washington
- 2015 Teaching Assistant, Yeast Genetics and Genomics, Cold Spring Harbor Laboratory
- 2010-2012 Teaching Assistant, Genetics and Evolution, with laboratory, Duke University

LEADERSHIP & OUTREACH

Mentoring

2017-2018	Mentored undergraduate student, Angela Hickey
2017-2018	Mentored Washington State University Bread Lab intern, Julia Berstein
2017	Mentored summer intern student, Kira Patterson
2017	Mentored graduate rotation student, Chris Large
2016	Mentored undergraduate student, Erica Alcantara
2013-2014	Mentored undergraduate student, Leigh Rauskauskas
2012-2013	Mentored undergraduate student, Bret Lesavoy
2010	Women and Math Mentor, promotion of math and science education for 8 th grade girls from Durham, NC public schools

Education & Public Outreach

2017-18	Science Teaching Experience for Postdocs fellow
2017	John Stanford International School Science Fair judge, Seattle, WA
2014	Invite-a-Scientist program through the North Carolina Science Festival
2009-2013	Lead and taught multi-day lab at a Durham, NC public high school
2011, 2013	Helped lead lab in Chapel Hill, NC middle school
2012	Gave public outreach talk at North Carolina Museum of Natural Sciences Nature Research Center, Raleigh, NC
2010	Presented at the North Carolina Science Teachers Association Professional Development Institute, Greensboro, NC
2010	Helped lead multi day lab in Durham, NC middle school
2010	Participated in 5 th grade science demonstration at a Durham, NC public school

Professional Service & Activities

2017-2018	Hit the Ground Running, a UW postdoctoral professional development program
2017-present	Genetics Society of America <i>GENETICS</i> Peer Review Training Program
2012-present	University of Pennsylvania Alumni Interviewer
2017	Attended University of Washington "Future Faculty Fellows" workshop
2015	Attended Genome Sciences Ethics course series
2013-2014	Duke Biology Department Graduate Steering Committee
2012-2014	Social Media Manager, American Genetics Association
2012-2013	Duke Biology Department Retreat Committee
2011-2012	Chair of Duke Biology Graduate Student Invited Speakers
2010-2013	F1000 Contributor
2010-2012	Chair of Duke University Population Biology Seminar Series
2010-2011	Duke Biology Department Graduate Steering Committee
2010	Attended Summer Institute for Statistical Genetics

Society Member: Society for the Study of Evolution, Genetics Society of America

Reviewer: *Evolution, Genetics, Genome Research, Genome Biology & Evolution, Molecular Biology & Evolution, BMC Genomics, G3, Food Microbiology, Yeast*, Netherlands Organization for Scientific Research (NWO)