

# Justin L. Conover

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## EDUCATION

- 2021 Ph.D. Genetics and Genomics  
Iowa State University, Ames, IA 50011  
Advisor: Dr. Jonathan F. Wendel  
Dissertation: Molecular Evolution Following Allopolyploidization in *Gossypium*
- 2015 B.S. Biology, *summa cum laude* with Distinction in the Honors College  
Missouri State University, Springfield, MO 95897  
Advisor: Dr. Laszlo Kovacs  
Undergraduate Thesis: Phenotyping a Segregant Mapping Population of *Vitis piasezkii* x *Vitis vinifera* (ssp. F2-35) for Quantitative Trait Loci (QTL) Analysis for Resistance to *Plasmopara viticola*

## PROFESSIONAL EXPERIENCE

- 2023-2026 NSF Postdoctoral Research Fellowship in Biology  
Project Title: Interplay of Ploidy and the Distribution of Fitness Effects in Brassica  
Sponsoring Scientists: Drs. Michael S. Barker and Ryan Gutenkunst  
University of Arizona, Tucson, AZ 85721
- Oct 2022- Adjunct Instructor  
Dec 2022 Department of Ecology and Evolutionary Biology, University of Arizona, Tucson, AZ 85721
- Aug 2022- Visiting Scientist with Dr. Daniel B. Sloan  
Oct 2022 Department of Biology, Colorado State University, Fort Collins, CO 80523
- Dec 2021- Postdoctoral Fellow with Drs. Jonathan F. Wendel and Daniel Peterson  
Feb 2023 Ecology, Evolution, and Organismal Biology Department, Iowa State University, Ames IA 50011

## PUBLICATIONS

[\* indicates co-first authorship]

### Pre-Prints and In-Prep Manuscripts

1. Hu G, Grover CE, Vera D, Lung P, Girmurugan S, Miller ER, **Conover JL**, Ou S, Xiong X, Zhu D, Li D, Gallagher JP, Udall J, Sui X, Zhang J, Bass H, Wendel JF. Evolutionary Dynamics of Chromatin Structure and Duplicate Gene Expression in Diploid and Allopolyploid Cotton. *In Review: Nature Plant*. Preprint: <https://doi.org/10.21203/rs.3.rs-3373364/v1>

2. **Conover JL**, Grover CE, Sharbrough J, Sloan DB, Peterson DG, Wendel JF. Little Evidence for Homoeologous Gene Conversion and Homoeologous Exchange Events in *Gossypium* Allopolyploids. *In Review: PNAS*. Preprint: <https://www.biorxiv.org/content/10.1101/2023.11.08.566278v1>
3. Sloan DB, **Conover JL**, Grover CE, Wendel JF, Sharbrough J. Polyploid Plants Take Cytonuclear Perturbations In Stride. *In Review: The Plant Cell*. Preprint: <https://ecoevorxiv.org/repository/view/6248/>

### Peer-Reviewed Research Papers

1. Peng R, Xu Y, Tian S, Unver T, Liu Z, Zhou Z, Cai X, Wang K, Wei Y, Liu Y, Wang H, Hu G, Zhang Z, Grover CE, Hou Y, Wang Y, Li P, Wang T, Lu Q, Wang Y, **Conover JL**, Ghazal H, Wang Q, Zhang B, Van Montagu M, Van de Peer Y, Wendel JF, Liu F. 2022. Evolutionary divergence of duplicated genomes in newly described allotetraploid cottons. *Proceedings of the National Academy of Sciences of the United States of America*. 119(39): e2208496119. DOI: <https://doi.org/10.1073/pnas.2208496119>
2. Grover CE\*, Forsythe ES\*, Sharbrough J, Miller ER, **Conover JL**, DeTar RA, Chavarro C, Arick II MA, Peterson DG, Leal-Bertioli SCM, Sloan DB, Wendel JF. 2022. Variation in cytonuclear expression accommodation among allopolyploid plants. *Genetics*. iyac118. DOI: <https://doi.org/10.1093/genetics/iyac118>
3. Forsythe ES\*, Grover CE\*, Miller ER, **Conover JL**, Arick II MA, Chavarro MCF, Leal-Bertioli SCM, Peterson DG, Sharbrough J, Wendel JF, Sloan DB. 2022. Organellar transcripts dominate the cellular mRNA pool across plants of varying ploidy levels. *Proceedings of the National Academy of Sciences of the United States of America*. 119(30): e2204187119. DOI: <https://doi.org/10.1073/pnas.2204187119>
4. Sharbrough J\*, **Conover JL\***, Fernandes Gyorfy M, Grover CE, Miller ER, Wendel JF, Sloan DB. 2022. Global patterns of subgenome evolution in organelle-targeted genes of six allotetraploid angiosperms. *Molecular Biology and Evolution*. 39(4): msac074. DOI: <https://doi.org/10.1093/molbev/msac074>
5. Karimi N, Grover CE, Gallagher JP, **Conover JL**, Miller ER, Wendel JF, Baum DA. 2022. Genetic diversity of Malagasy baobabs: implications for conservation. *Adansonia*. 44(6): 37-47. DOI: <https://doi.org/10.5252/adansonia2022v44a6>
6. **Conover JL**, Wendel JF. 2022. Deleterious mutations accumulate faster in allopolyploid than diploid cotton (*Gossypium*) and unequally between subgenomes. *Molecular Biology and Evolution*. 39(2): msac024. DOI: <https://doi.org/10.1093/molbev/msac024>
7. Yuan D, Grover CE, Hu G, Pan M, Miller ER, **Conover JL**, Hunt SP, Udall JA, Wendel JF. 2021. Parallel and intertwining threads of domestication in allopolyploid cotton. *Advanced Science*. 8(10): 2003634. DOI: <https://doi.org/10.1002/advs.202003634>
8. **Conover JL**, Sharbrough J, Wendel JF. 2021. pSONIC: Ploidy-aware Syntenic Orthologous Networks Identified via Collinearity. *G3: Genes | Genomes | Genetics*. 11(8): jkab170. DOI: <https://doi.org/10.1093/g3journal/jkab170>
9. Fernandes Gyorfy M, Miller ER, **Conover JL**, Grover CE, Wendel JF, Sloan DB, Sharbrough J. 2021. Nuclear-cytoplasmic balance: whole genome duplications induce elevated organellar genome copy number. *The Plant Journal*. 108: 219-230. DOI: <https://doi.org/10.1111/tpj.15436>
10. Chen ZJ, Sreedasyam A, Ando A, Song Q, De Santiago LM, Hulse-Kemp AM, Ding M, Ye W, Kirkbride RC, Jenkins J, Plott C, Lovell J, Lin Y-M, Vaughn R, Liu B, Simpson S, Scheffler BE, Wen L, Sasaki CA, Grover CE, Hu G, **Conover JL**, Carlson JW, Shu S, Boston LB, Williams M,

- Peterson DG, McGee K, Jones DC, Wendel JF, Stelly DM, Grimwood J, Schmutz J. 2020. Genomic diversifications of five *Gossypium* allopolyploid species and their impact on cotton improvement. *Nature Genetics*. 52(5): 525–533. DOI: <https://doi.org/10.1038/s41588-020-0614-5>
11. Grover CE, Yoo M-J, Lin M, Murphy MD, Harker DB, Byers RL, Lipka AE, Hu G, Yuan D, **Conover JL**, Udall JA, Paterson AH, Gore MA, Wendel JF. 2020. Genetic analysis of the transition from wild to domesticated cotton (*Gossypium hirsutum* L.). *G3: Genes | Genomes | Genetics*. 10(2):731–754. DOI: <https://doi.org/10.1534/g3.119.400909>
  12. Udall JA, Long E, Ramaraj T, **Conover JL**, Yuan D, Grover CE, Gong L, Arick II MA, Masonbrink RE, Peterson DG, Wendel JF. 2019. The genome sequence of *Gossypioides kirkii* illustrates a descending dysploidy in plants. *Frontiers in Plant Science*. 10: 1541. DOI: <https://doi.org/10.3389/fpls.2019.01541>
  13. Bao Y\*, Hu G\*, Grover CE, **Conover J**, Yuan D, Wendel JF. 2019. Unraveling cis and trans regulatory evolution during cotton domestication. *Nature Communications*. 10(1): 5399. DOI: <https://doi.org/10.1038/s41467-019-13386-w>
  14. Udall JA, Long E, Hanson C, Yuan D, Ramaraj T, **Conover JL**, Gong L, Arick II MA, Grover CE, Peterson DG, Wendel JF. 2019. De novo genome sequence assemblies of *Gossypium raimondii* and *Gossypium turneri*. *G3: Genes | Genomes | Genetics*. 9(10): 3079–3085. DOI: <https://doi.org/10.1534/g3.119.400392>
  15. Li C, Sun X, **Conover JL**, Zhang Z, Wang J, Wang X, Deng X, Wang H, Liu B, Wendel JF, Gong L. 2019. Cytonuclear coevolution following homoploid hybrid speciation in *Aegilops tauschii*. *Molecular Biology and Evolution*. 36(2): 341–349. DOI: <https://doi.org/10.1093/molbev/msy215>
  16. Grover CE, Arick II MA, Thrash A, **Conover JL**, Sanders WS, Peterson DG, Frelichowski JE, Scheffler JA, Scheffler BE, Wendel JF. 2019. Insights into the evolution of the New World diploid cottons (*Gossypium*, subgenus *Houzingenia*) based on genome sequencing. *Genome Biology and Evolution*. 11(1): 53–71. DOI: <https://doi.org/10.1093/gbe/evy256>
  17. **Conover JL\***, Karimi N\*, Stenz N, Ané C, Grover CE, Skema C, Tate JA, Wolff K, Logan SA, Wendel JF, Baum DA. 2019. A Malvaceae mystery: A mallow maelstrom of genome multiplications and maybe misleading methods? *Journal of Integrative Plant Biology*. 61(1): 12–31. DOI: <https://doi.org/10.1111/jipb.12746>
  18. Woodman S, Trousdale C, **Conover J**, Kim K. 2018. Yeast membrane lipid imbalance leads to trafficking defects toward the Golgi. *Cell Biology International*. 42(7): 890–902. DOI: <https://doi.org/10.1002/cbin.10956>
  19. Grover CE, Arick II MA, **Conover JL**, Thrash A, Hu G, Sanders WS, Hsu C-Y, Naqvi RZ, Farooq M, Li X, Gong L, Mudge J, Ramaraj T, Udall JA, Peterson DG, Wendel JF. 2017. Comparative genomics of an unusual biogeographic disjunction in the cotton tribe (*Gossypieae*) yields insights into genome downsizing. *Genome Biology and Evolution*. 9(12): 3328–3344. DOI: <https://doi.org/10.1093/gbe/evx248>

### Peer-Reviewed Perspectives, Review Articles, and Book Chapters

1. Hu G, Grover CE, Jareczek J, Yuan D, Dong Y, Miller E, **Conover JL**, Wendel JF. 2021. Evolution and diversity of the cotton genome. In: Rahman M-U, Zafar Y, Zhang T, editors. *Cotton Precision Breeding*. Cham: Springer. p. 25-78.
2. Sharbrough J, **Conover JL**, Tate JA, Wendel JF, Sloan DB. 2017. Cytonuclear responses to genome doubling. *American Journal of Botany*. 104: 1277-80. DOI: <https://doi.org/10.3732/ajb.1700293>

## RESEARCH FUNDING

- 2023-2026 National Science Foundation, Postdoctoral Fellowship in Biology. Interplay of Ploidy and the Distribution of Fitness Effects in Brassica. PRFB – 2209085 (\$216,000) Sponsoring Scientists: Drs. Michael Barker and Ryan Gutenkunst, University of Arizona, Tucson, AZ.
- 2022-2023 Pacific Biosciences Plant and Animal SMRT Grant Award. Genome architecture and evolution in allotetraploid coffee. (\$15,000 in-kind). Role: Co-PI, in collaboration with Joel Sharbrough (PI).
- 2021 Cotton, Incorporated. Determining Fixed Desirable and Undesirable Alleles as Targets for Gene Editing. (\$27,340).
- 2019-2021 National Science Foundation. The Cytonuclear Dimension of Allopolyploidy. PGRP – 1829176 (\$1,829,880). (PI Daniel B. Sloan, co-PI Jonathan F. Wendel, co-PI Joel Sharbrough, and co-PI Corrine E. Grover). *[This was a collaboration that spawned from a planned chapter of my dissertation, and although I am not formally associated with the grant, I helped develop the ideas for the Aims in the grant proposal and write the research plan. This grant thus funded a majority of my dissertation, my Postdoctoral position at Iowa State University, and my Visiting Scientist work at Colorado State University.]*
- 2018-2020 Cotton, Incorporated. Molecular Evolution Following Allopolyploidization in *Gossypium*. (\$72,055)

## SEMINAR AND CONFERENCE PRESENTATIONS

### Oral Presentations

1. Arizona PopGroup, Tempe AZ. Oct 2023. "Variation Graph Pangenomes Improve SNP Calling Accuracy in Diploid and Allopolyploids Populations."
2. Evolution 2023, Albuquerque, NM. June 2023. "Little Evidence for Homoeologous Gene Conversion and Homoeologous Exchanges in *Gossypium* Allopolyploids."
3. International Conference on Polyploidy, Palm Coast Florida. May 2023. "Little Evidence for Homoeologous Gene Conversion and Homoeologous Exchanges in *Gossypium* Allopolyploids."
4. Bioinformatics Seminar, University of Arizona. Dec 2022. "pSONIC: Strategies for Identifying Genome-Wide Sets of Orthologs Using Sequence Similarity and Conserved Gene Order."
5. Biology Department Seminar, New Mexico Institute of Mining and Technology. Oct 31, 2022. "A Malvaceae Mystery and Other '4N' Dynamics of Polyploid Genome Evolution."
6. Plant Super Group, Colorado State University. Sept 2022. "A Malvaceae Mystery: '4N' Dynamics of Plant Genome Evolution."
7. Guild of Rocky Mountain Ecologists and Evolutionary Biologists, Sept 2022. "Genomic and Transcriptomic Dimensions of Cytonuclear Coevolution in Allopolyploids"
8. Plant Genomes Online. April 2022. "Deleterious Mutations Accumulate Faster in Allopolyploid than Diploid Cottons."
9. Online Polyploidy Webinar (organized by Dr. Michael S. Barker). Sept 2020. "Mutation Load in Cotton: The Impacts of Polyploidy, Domestication, and Speciation."
10. SMBE 2020, Quebec City, Quebec, Canada. "Understanding Mutational Load in Cotton: The Roles of Polyploidy, Speciation, and Domestication." *[Cancelled due to COVID-19]*

11. International Conference on Polyploidy, Ghent, Belgium. June 2019. "Deleterious Mutation Accumulation in Cotton Polyploids."
12. PAG XXVI Plant and Animal Genome Conference, San Diego, California. Jan 2018. "Unusual Biogeographic Disjunction in the Cotton Tribe Yields Insight into Genome Downsizing."

### Poster Presentations

1. Conover JL, Gutenkunst RN, Barker MS. 26<sup>th</sup> NSF Plant Genome Research Program Awardee Meeting. September 2023. "Interplay of Ploidy and the Distribution of Fitness Effects in Brassica." Alexandria, Virginia.
2. **Conover JL**, N Karimi, N Stenz, C Ané, CE Grover, C Skema, JA Tate, K Wolff, SA Logan, JF Wendel, DA Baum. II Joint Congress on Evolutionary Biology. June 2018. "A Malvaceae Mystery: a Mallow Maelstrom of Genome Multiplications and Maybe Misleading Methods?" Montpellier, France.
3. **Conover JL**, Campbell C, Pap D, Riaz S, Coleman C, Kovács LG. May 2015. Phenotyping a segregant mapping population of *Vitis piasezkii* X *Vitis vinifera* hybrids for quantitative trait loci analysis for resistance to *Plasmopara viticola*. 4th Annual Grape and Wine Research Symposium, Columbia, Missouri.
4. **Conover JL**, Trousdale C, Kim K. May 2015. Changes in Membrane Lipid Composition Disrupt Yeast Protein Recycling. Missouri State University, College of Natural and Applied Sciences, Undergraduate Research Symposium, Springfield, Missouri.
5. **Conover JL**, Campbell C, Pap D, Riaz S, Coleman C, Kovács LG. May 2015. Phenotyping a segregant mapping population of *Vitis piasezkii* X *Vitis vinifera* hybrids for quantitative trait loci analysis for resistance to *Plasmopara viticola*. Missouri State University, College of Natural and Applied Sciences, Undergraduate Research Symposium, Springfield, Missouri. (Won First Prize in Cell and Molecular Biology Division)
6. **Conover JL**, Pap D, Riaz S, Coleman C, Kovács LG. May 2014. Differential host series analysis of *Plasmopara viticola* on select varieties of *Vitis vinifera*. Missouri State University, College of Natural and Applied Sciences, Undergraduate Research Symposium. Springfield, Missouri.

### HONORS AND AWARDS

- |      |   |
|------|---|
| 2022 | Outstanding Graduate Research Award, EEOB Department, Iowa State University   |
| 2015 | Outstanding Graduating Senior, Biology Department, Missouri State University  |
| 2015 | 1 <sup>st</sup> Place Poster Presentation. "Phenotyping a Segregant Mapping Population of <i>Vitis piasezkii</i> x <i>Vitis vinifera</i> hybrids for Quantitative Trait Loci Analysis for Resistance to <i>Plasmopara viticola</i> ". College of Natural and Applied Sciences Undergraduate Research Symposium, Cell and Molecular Biology Division, Missouri State University. |

### FELLOWSHIPS AND SCHOLARSHIPS

- |      |   |
|------|---|
| 2022 | NSF PRFB Fellow (Start Date: March 2023), National Science Foundation (\$216,000)                       |
| 2020 | Harry and Audrey Finch Fellowship, Iowa State University (\$2,000) [Cancelled due to Covid-19 pandemic] |

- 2018 Sui Tong Chan Fung Fund, Promotion of Study and Research in Genetics. Genetics and Genomics Graduate program travel fellowship, Iowa State University (\$500)
- 2016 Harry and Audrey Finch Fellowship, Iowa State University (\$2,000)
- 2015 Brown Graduate Research Award, Iowa State University (\$10,000)
- 2015 Graduate Fellowship, Phi Kapp Phi (\$5,000)
- 2015 CALS + PRES Graduate Student Supplemental Funding Fellowship, Iowa State University (\$18,000)

## TEACHING AND MENTORING EXPERIENCE

### Instructor of Record

- 2022 ECOL 326 Genomics. University of Arizona. Course enrollment: 95. *This course was taught online during the second half of the fall 2022 semester.*

### Guest Lecturer

- 2021 Special Topics in Evolutionary Biology (EEOB 590; ISU) – *Deleterious Mutations and Polyploidy*

### Course Preparation Assistance

- 2021- Evolution (Instructors: Drs. Nicole Valenzuela and Ryan Weaver; ISU)
- 2020- Evolutionary Genetics (Instructor: Dr. Matthew B. Hufford; ISU)

### Teaching Assistant

- 2016 BIO 212L Principles in Biology II Lab. ISU.

### Mentoring Rotating Graduate Students

- 2023 Seongyeon Kang (Ecology and Evolutionary Biology Program, UA)
- 2018 Samantha Snodgrass (Interdepartmental Plant Biology Program, ISU)
- 2017 Devin Molnau (Bioinformatics and Computational Biology Program, ISU)
- 2017 Zach Lozier (Bioinformatics and Computational Biology Program, ISU)

### Mentoring Research Experience for Teachers Program

- 2018 Ms. Alisa Poppen, High School Biology Teacher, Rowland Hall, Salt Lake City, UT 84102

## PROFESSIONAL SOCIETIES

- 2020- Botanical Society of America
- 2018- Society for the Study of Evolution
- 2016- Society for Molecular Biology and Evolution
- 2015- Phi Kapp Phi

## ACADEMIC SERVICE

### Journal Reviewer for –

- 2023 *Nature Communications; PNAS*
- 2022 *Plant Communications; The Plant Journal; G3: Genes | Genomes | Genetics; Biology Letters; Molecular Biology and Evolution*

2021 *New Phytologist*  
2020 *Plant Communications*  
2019 *Genome Biology and Evolution; Trends in Genetics*  
2018 *G3: Genes | Genomes | Genetics*

### **University/Departmental Committees and Leadership Opportunities**

2023- Postdoctoral Representative, University of Arizona EEB Community, Anti-Racism, and Equity (CARE) Committee.  
2020-2021 Graduate Representative, ISU EEOB Diversity, Equity, and Inclusion Committee  
2019-2020 Chapter Secretary, Iowa State University Out in Science, Technology, Engineering, and Mathematics (oSTEM)  
2019-2020 Graduate Representative, ISU College of Agriculture and Life Sciences Graduate Education Advisory Committee

### **Conference Workshop Organizer**

2023 Organizer, Polyploidy Workshop, Plant and Animal Genome Conference 30. San Diego, CA USA. Other organizers: Mathieu Rosseau-Gueutin  
2022 Co-organizer, Polyploidy Workshop, Plant and Animal Genome Conference XXIX. San Diego, CA USA. Other organizers: Armel Salmon