

# Ian S. Gilman, Ph.D.

Dept. of Plant Biology and Plant Resilience Institute, Michigan State University  
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## Professional appointments

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National Science Foundation Postdoctoral Research Fellow in Biology 2023 – Present  
(Area 3: Plant Genome)  
Hosted by Dr. Robert VanBuren, Michigan State University, East Lansing, MI

## Education

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Ph.D., Ecology & Evolutionary Biology 2023  
Yale University, New Haven, CT  
Primary advisor: Dr. Erika J. Edwards

M.S., Ecology & Evolutionary Biology 2021  
Yale University, New Haven, CT

M.S., Biological Sciences 2017  
University of Idaho, Moscow, ID  
Primary advisor: Dr. David C. Tank

B.S., Physics 2015  
Bucknell University, Lewisburg, PA

## Publications

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11. Rose A. Marks, Llewelyn Van Der Pas, Jenny Schuster, **Ian S. Gilman**, Robert VanBuren. 2024. Convergent evolution of desiccation tolerance in grasses. *Nature Plants* 10: 1112–1125
10. **Ian S. Gilman**, Karolina Heyduk, Carlos A. Maya-Lastra, Lillian P. Hancock, Erika J. Edwards. 2024. Predicting photosynthetic pathway from anatomy using machine learning. *New Phytologist* 242: 1029–1042
9. Rowan F. Sage, **Ian S. Gilman**, J. Andrew C. Smith, Katia Silvera, Erika J. Edwards. 2023. Atmospheric CO<sub>2</sub> decline and the timing of CAM plant evolution. *Annals of Botany* 132: 753–770
8. **Ian S. Gilman**, J. Andrew C. Smith, Joseph A.M. Holtum, Rowan F. Sage, Katia Silvera, Klaus Winter, Erika J. Edwards. 2023. The CAM lineages of planet Earth. *Annals of Botany* 132: 627–654
7. Jose J. Moreno-Villena, Haoran Zhou, **Ian S. Gilman**, S. Lori Tausta, C. Y. Maurice Cheung, Erika J. Edwards. 2022. Spatial resolution of an integrated C<sub>4</sub>+CAM photosynthetic metabolism. *Science Advances* 8:eabn2349
6. **Ian S. Gilman**, Jose Moreno-Villena, Zachary R. Lewis, Eric W. Goolsby, Erika J. Edwards. 2022. Gene co-expression reveals the modularity and integration of C<sub>4</sub> and CAM in *Portulaca*. *Plant Physiology* 189: 735–753

5. Aaron K. Lee\*, **Ian S. Gilman\***, Mansa Srivastav, Ariel D. Lerner, Michael J. Donoghue, Wendy L. Clement. 2021. Reconstructing Dipsacales phylogeny using Angiosperms353: Issues and insights. *American Journal of Botany*. 108(7): 1122–1142  
\* indicates equal authorship
4. **Ian S. Gilman** and Erika J. Edwards. Crassulacean Acid Metabolism. 2020 *Current Biology*. 30 (2), R57–R62
3. Karolina Heyduk, Jose J. Moreno-Villena, **Ian S. Gilman**, Pascal-Antoine Christin, Erika J. Edwards. 2019. The genetics of convergent evolution: Insights from plant photosynthesis. *Nature Reviews Genetics*. 313:1–9
2. Christopher T. Martine, Ingrid E. Jordon-Thaden, Angela J. McDonnell, Jason T. Cantley, Daniel S. Hayes, Morgan D. Roche, Emma S. Frawley, **Ian S. Gilman**, David C. Tank. 2019. Phylogeny of the Australian *Solanum dioicum* group using seven nuclear genes: testing Symon’s fruit and seed dispersal hypotheses. *PLoS ONE*. 14:e0207564
1. **Ian S. Gilman** and Tank David C. Species tree estimation using ddRADseq data from historical specimens confirms the monophyly of highly disjunct species of *Chloropyron* (Orobanchaceae). 2018. *Systematic Botany*. 43(3):701–708

## Grants, fellowships, and awards

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|------------------------------------------------------------------------------------------------------------------|----------------------------|
| 12. Department of Energy’s Joint Genome Institute Community Science Project (PI)                                 | 2025                       |
| 11. Plant Resilience Institute Seed Grant, Michigan State University<br>(co-PI with graduate student Daniel Mok) | (\$10,000) 2024            |
| 10. Spangler Prize for Outstanding Dissertation<br>Department of Ecology & Evolutionary Biology, Yale University | (\$1,000) 2024             |
| 9. Plant Resilience Institute Seed Grant (PI), Michigan State University                                         | (\$10,000) 2024            |
| 8. National Science Foundation Postdoctoral Research Fellow<br>in Biology (Area 3: Plant Genome)                 | (\$216,000) 2023 – Present |
| 7. Yale Institute for Biospheric Studies Fellowship                                                              | 2020 – 2021                |
| 6. MacMillan Dissertation Research Fellowship                                                                    | (\$14,068) 2019            |
| 5. Henry Daggett Hooker Memorial Fellow, Yale Graduate School<br>of Arts and Science                             | 2017 – 2018                |
| 4. Honorable Mention National Science Foundation Graduate<br>Research Fellowship Program                         | 2017                       |
| 3. American Society of Plant Taxonomists Rogers McVaugh<br>Graduate Student Research Award                       | (\$1,000) 2016             |
| 2. Honorable Mention National Science Foundation Graduate<br>Research Fellowship Program                         | 2016                       |
| 1. University of Idaho Stillinger Herbarium Expedition Grant                                                     | (\$8,403) 2016             |

## Selected presentations and invited lectures

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13. **Ian S. Gilman** and Robert VanBuren. 2025. Single-nuclei transcriptomics of a complex photosynthetic system: C<sub>4</sub>+CAM in *Portulaca amilis*. Botany Conference, Palm Springs, CA.
12. **Ian S. Gilman** and Robert VanBuren. 2024. Evolution of facultative and constitutive gene regulation in plants with CAM photosynthesis. XX International Botanical Congress, Madrid, Spain.
11. **Ian S. Gilman**, Karolina Heyduk, Carlos A. Maya-Lastra, Lillian P. Hancock, Erika J. Edwards. 2023. Evolution of CAM anatomy and predicting physiology from anatomy. Botany Conference, Boise, ID.
10. **Ian S. Gilman**, Karolina Heyduk, Carlos A. Maya-Lastra, Lillian P. Hancock, Erika J. Edwards. 2023. Evolution of CAM anatomy and predicting physiology from anatomy. CAM Conference, Panama City, Panama.
9. **Ian S. Gilman**. 2023. Photosynthesis and Evolution by Duplication. Invited lecture at the Yale Peabody Museum, New Haven, CT.
8. **Ian S. Gilman**. 2023. Plant carbon concentrating mechanism and the changing climate. Invited lecture for Molecular Biology & Biophysics 365/565, Yale University, New Haven, CT.
7. **Ian S. Gilman**, Jose J. Moreno-Villena, Zachary R. Lewis, Eric W. Goolsby, Erika J. Edwards. 2021. Gene co-expression reveals evolutionarily conserved and distinct photosynthetic networks in C<sub>4</sub>+CAM *Portulaca*. Evolution Conference. Virtual.
6. **Ian S. Gilman**, Erika J. Edwards, Zachary R. Lewis. 2020. Genome sequencing of *Portulaca amilis*, a C<sub>4</sub>+CAM plant. International Plant & Animal Genome Conference. San Diego, CA.
5. **Ian S. Gilman** and Erika J. Edwards. 2019. Using computer vision to detect CAM photosynthesis. Sussex Plant Symposium. New Haven, CT.
4. **Ian S. Gilman** and Erika J. Edwards. 2018. Distinguishing CAM photosynthesis with machine learning. Botany Conference. Rochester, WI.
3. **Ian S. Gilman**, Lillian P. Hancock, Elissa Martin, Zachary R. Lewis, Erika J. Edwards. 2018. Changes in gene expression during CAM induction in a C<sub>4</sub>-CAM plant. CAM Conference. Phoenix, AZ.
2. **Ian S. Gilman** and David C. Tank. 2017. Sensitivity of quartet-based species tree methods to missing data. Evolution Conference. Portland, OR.
1. **Ian S. Gilman** and David C. Tank. 2016. Comparative phylogenetics of niche condition in *Cordylanthus* and *Pseudocordylanthus* (Orobanchaceae). Botany Conference. Savannah, GA.

## Teaching, mentorship, and service

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|------------------------------------------------------------------------------|------------------|
| Botanical Society of America Early Career Professional Development Committee | 2025 – Present   |
| Preparing Leaders and Nurturing Tomorrow's Scientists (PLANTS) Mentor        | 2016, 2023, 2025 |
| ROOT & SHOOT Working Group for Culturally Aware Mentorship                   | 2023 – 2025      |
| Botanical Society of America Investment Committee                            | 2018 – 2021      |

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| Graduate teaching fellow, Yale University<br><i>Courses: Ecology and Evolutionary Biology, Plants and People, Plant Diversity</i>                 | 2017 – 2019 |
| Scientist mentor, Planting Science (plantingscience.org)<br><i>Encourage and guide students as they create plant-based experiments</i>            | 2016 – 2019 |
| Graduate teaching assistant, University of Idaho<br><i>Courses: Form and Function, Computational Skills for Biologists, Advanced Field Botany</i> | 2015 – 2017 |
| Graduate research mentor, University of Idaho<br><i>Mentored undergraduate through a field-based research project in plant systematics</i>        | 2016        |

*Ad hoc* reviewer for *Annals of Botany*, *Current Opinion in Plant Biology*, *Journal of Plant Physiology*, *Molecular Ecology*, *Molecular Plant*, *Nature Communications Biology*, *New Phytologist*, *Planta*, *The Plant Cell*, *The Plant Journal*, and *Plants, People, Planet*, *PLOS ONE*, and the United States Geological Survey.