

# Nicholas A. Johnson

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## Education

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| <b>Michigan State University</b> , Ph.D., <i>dual major</i> , Genetics and Genome Sciences; Ecology, Evolution, and Behavior | Aug 2021 – Current  |
| <b>University of Minnesota, Twin-Cities</b> , B.S., Plant Science (Breeding and Genetics)                                    | Aug 2018 – May 2020 |
| <b>Normandale Community College</b> , A.A., Liberal Arts   | Aug 2012 – Dec 2017 |

## Research Experience

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| <b>Graduate Research Assistant</b> , Michigan State University – East Lansing, MI<br><i>Principal Investigator: Dr. Eric L. Patterson</i>  | Aug 2021 – Current   |
| <ul style="list-style-type: none"><li>• Investigating genomic patterns associated with adaptation in weedy plants through comparative genomics</li><li>• Developing assorted genomic and evolutionary analysis tools to reduce barriers of analysis for non-computational biologists</li><li>• Revealed genomic structural variation associated with herbicide resistance evolution in the agronomic weed <i>Eleusine indica</i> using comparative genomics approaches</li><li>• Automated a computational gene annotation pipeline with BASH wrapper scripts</li></ul>    |                      |
| <b>Biological Science Technician (GS-7)</b> , United States Department of Agriculture (U.S.D.A.) – Logan, UT<br><i>Principal Investigator: Dr. Matthew D. Robbins</i>  | July 2024 – Feb 2025 |
| <ul style="list-style-type: none"><li>• Assembled and annotated the genome of <i>Penstemon fruticosus</i>, a model genus for floral morphology evolution</li><li>• Investigated the evolution of floral morphology among <i>Penstemon</i> species with comparative genomics</li><li>• Currently writing a manuscript on these findings</li></ul>   |                      |
| <b>Undergraduate Researcher</b> , University of Minnesota – St. Paul, MN<br><i>Principal Investigator: Dr. Alan G. Smith</i>   | Dec 2018 – May 2020  |
| <ul style="list-style-type: none"><li>• Independently researched abiotic stress and intraspecific competition of <i>Nicotiana tabacum</i> (tobacco) pollen</li><li>• Developed a Nanodrop Spectrophotometer method for quantifying pollen in a liquid solution</li><li>• Propagated, crossed, tissue cultured, regenerated, and transformed tobacco plants</li><li>• Collected and tissue cultured invasive plants and discussed management techniques with landowners</li><li>• Communicated results through an undergraduate thesis and symposia presentations</li></ul> |                      |

## Teaching and Mentoring Experience

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| <b>Graduate Teaching Assistant</b> , Michigan State University – East Lansing, MI<br><i>IBIO 341 Fundamental Genetics – Instructor: Dr. Jeanette McGuire</i>   | Jan 2024 – May 2024  |
| <ul style="list-style-type: none"><li>• Guided students through course content with two recitation sections and open office hours weekly</li><li>• Graded assignments, quizzes, and exams</li><li>• Contributed to course refinement through weekly meetings with the instructor and teaching assistants</li></ul> |                      |
| <b>Mentor</b> , Michigan State University – East Lansing, MI<br><i>Research Experience for Undergraduates in Plant Genomics</i>  | May 2023 – July 2023 |
| <ul style="list-style-type: none"><li>• Guided a visiting student exploring subgenome evolution in a genus of agronomic weeds and crops</li><li>• Helped students develop programming, computational analysis, and presentation skills</li></ul>   |                      |
| <b>Lead Trainer</b> , International Weed Genomics Consortium Meeting, Washington, D.C.<br><i>Introductory Bioinformatics Workshop</i>  | Jan 30 2023          |
| <ul style="list-style-type: none"><li>• Led a conference workshop for primarily non-computational or early career scientists</li></ul>   |                      |

- Guided participants through a full RNA-Seq pipeline using public data
- Helped organize event and develop workshop scripts

**Trainer**, Michigan State University – East Lansing, MI

Oct 15 2022

*Ecotek Lab Youth Scientists Visit*

- Taught visiting junior scientists about genetics
- Helped junior scientists run P.C.R. and subsequent gel electrophoresis

**Mentor**, Michigan State University – East Lansing, MI

June 2022 – Present

*Graduate Recruitment Initiative Team*

- Guiding first-year Ph.D. students (assigned one student annually) through professional and general graduate student life decisions to help them acclimate
- Attending group-sponsored meetings to recruit and retain graduate students

**Mentor**, Michigan State University – East Lansing, MI

May 2022 – July 2022

*Research Experience for Undergraduates in Plant Genomics*

- Guided a visiting student through comparative genomics of agronomic weeds and crops to find genomic patterns associated with domestication
- Helped students develop programming, computational analysis, and presentation skills

**Graduate Teaching Assistant**, Michigan State University – East Lansing, MI

May 2022 – July 2022

*CSS 126 Introduction to Weed Management – Instructor: Dr. Erin Hill*

- Graded and provided feedback on a semester-long project on agronomic weed identification, biology, and management throughout the course

## Fellowships and Awards

**Agricultural Genome to Phenome Initiative Travel Award**, United States

July 2024

Department of Agriculture and Iowa State University

**NSF Research Trainee Travel Award**, National Science Foundation and Michigan

July 2024

State University

**NSF Integrated Training Model in Computational Plant Sciences Fellowship**,

Aug 2022 – Aug 2023

National Science Foundation and Michigan State University

**Plant Biotechnology for Health and Sustainability Fellowship**, National Institutes of Health and Michigan State University

May 2022 – May 2025

**Collegiate Scholars Award**, American Society of Horticultural Science

May 2020

**Undergraduate Research Opportunity Program**, University of Minnesota, Twin-Cities

Jan 2019 – May 2019

**Edward Hartwig Undergraduate Scholarship**, University of Minnesota, Twin-Cities

Aug 2018 – May 2020

**Dr. Laddie Elling Outstanding Achievement Scholarship**, University of Minnesota, Twin-Cities

Aug 2018 – May 2020

## Conference Presentations

**Chromosome-level assembly of the allohexaploid *Chenopodium album* L. genome reveals selection pressures on genes associated with adaptation**

June 2024

**Johnson, N. A.**, Cutti, L., Abdollahi, F., Fengler, K., Nelson, D. R., Llaca, V., MacGregor, D. R., Maughan, P. J., Gaines, T. A., & Patterson, E. L.

*Plant Biology 2024*: Poster presentation

**Subtelomeric *EPSPS* duplications confer glyphosate resistance in *Eleusine indica***

Jan 2024

**Johnson, N. A.**, Hall, N., Zhang, C., Yu, Q., & Patterson, E. L.

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| <i>Weed Science Society of America Annual Meeting</i> : Single-slide oral presentation  |                     |
| <b>Subtelomeric 5-enolpyruvylshikimate-3-phosphate synthase copy number variation confers glyphosate resistance in <i>Eleusine indica</i></b> | Dec 2023            |
| Johnson, N. A., Hall, N., Zhang, C., Yu, Q., & Patterson, E. L.   |                     |
| <i>North Central Weed Science Society Annual Meeting</i> : Poster presentation  |                     |
| <b>Weeds, genomics, and evolution</b>   | Jan 2023            |
| Johnson, N. A.  |                     |
| <i>Weed Science Society of America Annual Meeting</i> : Three-minute thesis oral presentation   |                     |
| <b>FHY3/FAR1 transposable elements generate adaptive genetic variation in the <i>Bassia scoparia</i> genome</b>                               | Jan 2023            |
| Johnson, N. A.  |                     |
| <i>Plant and Animal Genome Conference 30</i> : Oral presentation  |                     |
| <b>Subtelomeric 5-enolpyruvylshikimate-3-phosphate synthase copy number variation confers glyphosate resistance in <i>Eleusine indica</i></b> | Jan 2023            |
| Johnson, N. A., Hall, N., Zhang, C., Yu, Q., & Patterson, E. L.   |                     |
| <i>Plant and Animal Genome Conference 30</i> : Poster presentation  |                     |
| <b>Subtelomeric rearrangements cause glyphosate resistance in <i>Eleusine indica</i></b>  | Dec 2022            |
| Johnson, N. A., Hall, N., Zhang, C., Yu, Q., & Patterson, E. L.   |                     |
| <i>North Central Weed Science Society Annual Meeting</i> : Oral presentation  |                     |
| <b>Certificates</b>   |                     |
| <b>Computational Plant Science Graduate Certificate</b> , Michigan State University   | May 2024            |
| <b>Additional Volunteer Positions</b>   |                     |
| <b>Peer Reviewer</b> , Plant Communications – One article   | July 2024 – Present |
| <b>Genetics and Genome Sciences Program Representative</b> , Michigan State University  | May 2024 – Present  |
| <b>Peer Reviewer</b> , Plant Physiology – One article   | Sept 2023 – Present |
| <b>Publications</b>   |                     |
| <b>Assembly and annotation of the tetraploid <i>Salsola tragus</i> (Russian thistle) genome</b>   | Jan 2025            |
| Lemas, J., <i>et al.</i>  |                     |
| <i>Genome Biology and Evolution</i> – 10.1093/gbe/evaf014   |                     |
| <b>Genomic structural variation and herbicide resistance</b>  | Dec 2024            |
| Johnson, N. A., Lemas, J., Montgomery, J., Gaines, T., & Patterson, E. L.   |                     |
| <i>Canadian Journal of Plant Science</i> – 10.1139/cjps-2024-0199   |                     |
| <b>Expression-based machine learning models for predicting plant tissue identity</b>  | Jan 2024            |
| Palande, S., <i>et al.</i>  |                     |
| <i>Applications in Plant Sciences</i> – 10.1002/aps3.11621  |                     |
| <b>Subtelomeric 5-enolpyruvylshikimate-3-phosphate synthase copy number variation confers glyphosate resistance in <i>Eleusine indica</i></b> | Aug 2023            |
| Zhang, C. & Johnson, N. A., Hall, N., Tian, X., Yu, Q., & Patterson, E. L.  |                     |
| <i>Nature Communications</i> – 10.1038/s41467-023-40407-6   |                     |

## Additional Employment History

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| <b>Technical Sales Representative</b> , TubeWriter – Fremont, CA                  | Dec 2020 – Aug 2021 |
| <b>In-House Sales Representative</b> , Gardenworld, Inc. – Cottage Grove, MN      | Aug 2020 – Dec 2020 |
| <b>Server</b> , Simon & Seafort's – Anchorage, AK                                 | May 2018 – Aug 2018 |
| <b>Server</b> , Al Vento – Minneapolis, MN  | Apr 2016 – May 2018 |
| <b>Wait Assistant/Food Runner</b> , Al Vento – Minneapolis, MN                    | Apr 2015 – Apr 2016 |
| <b>Valet</b> , Meritage – St. Paul, MN  | Feb 2014 – Apr 2015 |
| <b>Valet/Bellman</b> , Hotel Zetta – San Francisco, CA                            | May 2013 – Feb 2014 |
| <b>Valet</b> , The W, Foshay Tower – Minneapolis, MN                              | Jan 2012 – May 2013 |
| <b>Package Handler</b> , United Parcel Service – M.S.P. International Airport, MN | Nov 2011 – Feb 2013 |