

Nicholas A. Johnson

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Education

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| Michigan State University , Ph.D., dual major, Genetics and Genome Sciences; Ecology, Evolution, and Behavior | Aug 2021 – Current |
| Michigan State University , Computational Plant Science Graduate Certificate | Aug 2021 - May 2024 |
| University of Minnesota, Twin-Cities , B.S., Plant Science (Breeding and Genetics) | Aug 2018 – May 2020 |
| Normandale Community College , A.A., Liberal Arts | Aug 2012 – Dec 2017 |

Research Experience

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

Teaching and Mentoring Experience

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

Introductory Bioinformatics Workshop

- Led a conference workshop for primarily non-computational or early career scientists
- 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, Grants, and Awards

Outstanding Student Award, Genetics and Genome Sciences Program – Michigan State University

May 2025

Outstanding Scholar Fellowship, College of Natural Sciences – Michigan State University

Mar 2025

Deep Learning Cis-Regulation Research Grant, BASF – Germany

Jan 2025 - Jan 2026

Agricultural Genome to Phenome Initiative Travel Award, United States Department of Agriculture and Iowa State University

July 2024

NSF Research Trainee Travel Award, National Science Foundation and Michigan State University

July 2024

NSF Integrated Training Model in Computational Plant Sciences Fellowship, National Science Foundation and Michigan State University

Aug 2022 – Aug 2023

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

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| Annotating cis-regulatory elements in plants via deep learning | July 2025 |
| Johnson, N. A., Filho, D., Bernhofer, M., Islamovic, E., Murphy, B., & Patterson, E. L. | |
| <i>BASF North American Open Research Alliance 2025:</i> Oral presentation | |
| A high-throughput pipeline for measuring selection pressure during comparative genomic analysis | Feb 2025 |
| Johnson, N. A., Cutti, L., Gaines, T. A., & Patterson, E. L. | |
| <i>Weed Science Society of America 2025:</i> Oral presentation | |
| Chromosome-level assembly of the allohexaploid <i>Chenopodium album</i> 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. | |
| <i>Plant Biology 2024:</i> Poster presentation | |
| Subtelomeric EPSPS duplications confer glyphosate resistance in <i>Eleusine indica</i> | Jan 2024 |
| Johnson, N. A., Hall, N., Zhang, C., Yu, Q., & Patterson, E. L. | |
| <i>Weed Science Society of America Annual Meeting:</i> Single-slide oral presentation | |
| Subtelomeric 5-enolpyruvylshikimate-3-phosphate synthase copy number variation confers glyphosate resistance in <i>Eleusine indica</i> | 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 | |
| Weeds, genomics, and evolution | Jan 2023 |
| Johnson, N. A. | |
| <i>Weed Science Society of America Annual Meeting:</i> Three-minute thesis oral presentation | |
| FHY3/FAR1 transposable elements generate adaptive genetic variation in the <i>Bassia scoparia</i> genome | Jan 2023 |
| Johnson, N. A. | |
| <i>Plant and Animal Genome Conference 30:</i> Oral presentation | |
| Subtelomeric 5-enolpyruvylshikimate-3-phosphate synthase copy number variation confers glyphosate resistance in <i>Eleusine indica</i> | Jan 2023 |
| Johnson, N. A., Hall, N., Zhang, C., Yu, Q., & Patterson, E. L. | |
| <i>Plant and Animal Genome Conference 30:</i> Poster presentation | |
| Subtelomeric rearrangements cause glyphosate resistance in <i>Eleusine indica</i> | 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 | |

Additional Volunteer Positions

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| Peer Reviewer , Chromosome Research – One article | Feb 2025 – Present |
| Peer Reviewer , Plant Communications – Two articles | July 2024 – Present |
| Genetics and Genome Sciences Program Representative , Michigan State University | May 2024 – Present |
| Peer Reviewer , Plant Physiology – One article | Sept 2023 – Present |

Publications

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| Assembly and annotation of the tetraploid <i>Salsola tragus</i> (Russian thistle) genome | Jan 2025 |
| Lemas, J., <i>et al.</i> | |
| <i>Genome Biology and Evolution</i> – 10.1101/gbe/evaf014 | |
| Genomic structural variation and herbicide resistance | 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 | |
| Expression-based machine learning models for predicting plant tissue identity | Jan 2024 |
| Palande, S., <i>et al.</i> | |
| <i>Applications in Plant Sciences</i> – 10.1002/aps3.11621 | |
| Subtelomeric 5-enolpyruylshikimate-3-phosphate synthase copy number variation confers glyphosate resistance in <i>Eleusine indica</i> | Aug 2023 |
| Zhang, C.* & Johnson, N. A.* , Hall, N., Tian, X., Yu, Q., & Patterson, E. L. | |
| *Co-first authors | |
| <i>Nature Communications</i> – 10.1038/s41467-023-40407-6 | |

Additional Employment History

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