

Nicholas A. Johnson

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Education

Michigan State University , Ph.D., <i>dual major</i> , 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

Graduate Research Assistant , Michigan State University – East Lansing, MI <i>Principal Investigator: Dr. Eric L. Patterson</i>	Aug 2021 – Current
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- Investigating genomic patterns associated with adaptation in weedy plants through comparative genomics
- Revealed genomic structural variation associated with herbicide resistance evolution in the agronomic weed *Eleusine indica* using comparative genomics approaches, advancing understanding of weed adaptation
- Developed genomic and evolutionary analysis pipelines (Unix, Python, R) to automate workflows and expand accessibility for non-computational biologists
- Secured BASF funding to develop a self-conceptualized deep learning approach to annotate cis-regulatory elements in model and non-model plants
- Frequently communicated results through seminars, conference presentations, open-source software, and publications
- Provided continuous mentorship and collaboration in computational methods with undergraduate and graduate students, post-doctoral researchers, faculty, and external collaborators

Biological Science Technician (GS-7) , United States Department of Agriculture (U.S.D.A.) – Logan, UT	July 2024 – Feb 2025
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Principal Investigator: Dr. Matthew D. Robbins

- Assembled and annotated the genome of *Penstemon fruticosus*, a model genus for floral morphology evolution
- Investigated the evolution of floral morphology among *Penstemon* species with comparative genomics
- Currently writing a manuscript on these findings

Undergraduate Researcher , University of Minnesota – St. Paul, MN	Dec 2018 – May 2020
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Principal Investigator: Dr. Alan G. Smith

- Independently researched abiotic stress and intraspecific competition of *Nicotiana tabacum* (tobacco) pollen
- Developed a Nanodrop Spectrophotometer method for quantifying pollen in a liquid solution
- Propagated, crossed, tissue cultured, regenerated, and transformed tobacco plants
- Collected and tissue cultured invasive plants and discussed management techniques with landowners
- Communicated results through an undergraduate thesis and symposia presentations

Teaching and Mentoring Experience

Graduate Teaching Assistant , Michigan State University – East Lansing, MI <i>IBIO 341 Fundamental Genetics – Instructor: Dr. Jeanette McGuire</i>	Jan 2024 – May 2024
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- Guided students through course content with two recitation sections and open office hours weekly
- Graded assignments, quizzes, and exams
- Contributed 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 crops • Helped students develop programming, computational analysis, and presentation skills 	
Lead Trainer , International Weed Genomics Consortium Meeting, Washington, D.C. <i>Introductory Bioinformatics Workshop</i>	Jan 30 2023
<ul style="list-style-type: none"> • 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 <i>Ecotek Lab Youth Scientists Visit</i>	Oct 15 2022
<ul style="list-style-type: none"> • Taught visiting junior scientists about genetics • Helped junior scientists run P.C.R. and subsequent gel electrophoresis 	
Mentor , Michigan State University – East Lansing, MI <i>Graduate Recruitment Initiative Team</i>	June 2022 – Present
<ul style="list-style-type: none"> • 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 <i>Research Experience for Undergraduates in Plant Genomics</i>	May 2022 – July 2022
<ul style="list-style-type: none"> • 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 <i>CSS 126 Introduction to Weed Management – Instructor: Dr. Erin Hill</i>	May 2022 – July 2022
<ul style="list-style-type: none"> • 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	May 2025 - Aug 2025
Deep Learning Cis-Regulation Research Grant , BASF – Germany	Jan 2025 - Dec 2025
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

- 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.
BASF North American Open Research Alliance 2025: 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.
Weed Science Society of America 2025: Oral presentation
- 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.
Weed Science Society of America Annual Meeting: Single-slide oral presentation
- Subtelomeric 5-enolpyruvylshikimate-3-phosphate synthase copy number variation confers glyphosate resistance in *Eleusine indica*** Dec 2023
Johnson, N. A., Hall, N., Zhang, C., Yu, Q., & Patterson, E. L.
North Central Weed Science Society Annual Meeting: Poster presentation
- Weeds, genomics, and evolution** Jan 2023
Johnson, N. A.
Weed Science Society of America Annual Meeting: Three-minute thesis oral presentation
- FHY3/FAR1 transposable elements generate adaptive genetic variation in the *Bassia scoparia* genome** Jan 2023
Johnson, N. A.
Plant and Animal Genome Conference 30: Oral presentation
- Subtelomeric 5-enolpyruvylshikimate-3-phosphate synthase copy number variation confers glyphosate resistance in *Eleusine indica*** Jan 2023
Johnson, N. A., Hall, N., Zhang, C., Yu, Q., & Patterson, E. L.
Plant and Animal Genome Conference 30: Poster presentation
- Subtelomeric rearrangements cause glyphosate resistance in *Eleusine indica*** Dec 2022
Johnson, N. A., Hall, N., Zhang, C., Yu, Q., & Patterson, E. L.
North Central Weed Science Society Annual Meeting: Oral presentation

Additional Volunteer Positions

- Peer Reviewer**, Scientific Data – One article Aug 2025 – Present
- 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 – May 2025

Publications

Assembly and annotation of the tetraploid *Salsola tragus* (Russian thistle) genome Jan 2025

Lemas, J., *et al.*

Genome Biology and Evolution – 10.1093/gbe/evaf014

Genomic structural variation and herbicide resistance Dec 2024

Johnson, N. A., Lemas, J., Montgomery, J., Gaines, T., & Patterson, E. L.

Canadian Journal of Plant Science – 10.1139/cjps-2024-0199

Expression-based machine learning models for predicting plant tissue identity Jan 2024

Palande, S., *et al.*

Applications in Plant Sciences – 10.1002/aps3.11621

Subtelomeric 5-enolpyruvylshikimate-3-phosphate synthase copy number variation confers glyphosate resistance in *Eleusine indica* Aug 2023

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

*Co-first authors

Nature Communications – 10.1038/s41467-023-40407-6

Additional Employment History

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