Nicholas A. Johnson

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Education

Michigan State University, Ph.D., *dual major*, Genetics and Genome Sciences; Ecology, Evolution, and Behavior — Aug 2021 – Current

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 — Aug 2021 – Current
Principal Investigator: Dr. Eric L. Patterson

- Investigating genomic patterns associated with adaptation in weedy plants through comparative genomics
- Developing assorted genomic and evolutionary analysis tools to reduce barriers of analysis for non-computational biologists
- Revealed genomic structural variation associated with herbicide resistance evolution in the agronomic weed *Eleusine indica* using comparative genomics approaches
- Automated 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 — July 2024 – Feb 2025
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
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 — Jan 2024 – May 2024
IBIO 341 Fundamental Genetics – Instructor: Dr. Jeanette McGuire

- 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 — May 2023 – July 2023
Research Experience for Undergraduates in Plant Genomics

- 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. — 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 Scholar Fellowship, 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

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

Certificates

Computational Plant Science Graduate Certificate, Michigan State University May 2024

Additional Volunteer Positions

Peer Reviewer, Plant Communications – One article 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

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.

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