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

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

- Assembling and annotating *Penstemon fruticosus* genome
- Resequencing five additional *Penstemon* species
- Investigating evolutionary relationships of floral morphology among *Penstemon spp.* on the genomic level

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
- 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 computational approaches
- Automated a computational gene annotation pipeline with BASH wrapper scripts

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 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 plant samples and discussed management techniques with landowners

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, hour-long recitation meetings and two hours of open office time 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 a P.A.G.E. gel

Mentor, Michigan State University – East Lansing, MI June 2022 – Present
Graduate Recruitment Initiative Team

- Guide first-year Ph.D. students (assigned one student annually) through professional and general graduate student life decisions to help them acclimate
- Attend 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 conducting comparative of agronomic weeds and crops to find genomic patterns of 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

Select Fellowships and Awards

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

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

Intraspecific pollen tube competition Apr 2020

Johnson, N. A., Abbey, M., & Smith, A. G.

University of Minnesota, Twin-Cities Undergraduate Research Symposium: Poster presentation

Certificates

Computational Plant Science Graduate Certificate, Michigan State University May 2024

Additional Volunteer Positions

Genetics and Genome Sciences Program Representative, Michigan State University May 2024 – Present

Peer Reviewer, Plant Physiology – One article Sept 2023 – Present

Publications

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

Palande, S., ***et al.***

bioRxiv: 10.1101/2023.08.20.554029

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

Undergraduate Thesis: Intraspecific salt tolerance variation in *Nicotiana tabacum* pollen germination and pollen tube growth Aug 2019

Johnson, N. A., Smith, K. P., & Smith, A. G.

UMN Digital Conservancy: https://hdl.handle.net/11299/206480 (*not peer-reviewed*)

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