

Mitchell G. Roth, Ph.D.

Curriculum vitae

Research and Scholarship	p. 1-8	The Ohio State University
Teaching and Mentorship	p. 8-9	1680 Madison Ave, 118 Selby Hall
Extension and Outreach	p. 9	Wooster, OH 44691
Statement of Diversity	p. 10	330-263-9701 (office)
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RESEARCH AND SCHOLARSHIP

EMPLOYMENT

2021 – Present	Assistant Professor – Molecular Mycologist Department of Plant Pathology, The Ohio State University, Ohio Agricultural Research and Development Center, Wooster, OH 44691
2019 – 2021	Postdoctoral Research Associate Department of Plant Pathology, University of Wisconsin – Madison, Madison, WI 53711
2014 – 2019	Graduate Research Assistant Department of Plant, Soil and Microbial Sciences, Michigan State University, East Lansing, MI 48824

EDUCATION AND TRAINING

2019 – 2021	Postdoctoral Research Associate – UW-Madison Co-advisor: Dr. Mehdi Kabbage Co-advisor: Dr. Damon Smith
2014 – 2019	Ph.D. – Michigan State University Majors: Genetics and Plant Pathology Advisor: Dr. Martin Chilvers Dissertation Title: Investigating Management and Genetics of Soybean Sudden Death Syndrome Pathogens <i>Fusarium virguliforme</i> and <i>F. brasiliense</i>
2010 – 2014	B.S. – Grand Valley State University Major: Cell and Molecular Biology Advisor: Dr. Margaret Dietrich Minor: Applied Statistics

GRANTS AND FELLOWSHIPS

Total Grant + Fellowship Funding Garnered to date: **\$602,000**

Grants and Fellowships Awarded or Under Review

<u>Year</u>	<u>Role</u>	<u>Funding Opportunity</u>	<u>Amount Awarded</u>
2021	Lead PI	Corteva Agriscience	<i>Under Review</i>
2021	Lead PI	Ohio State University CFAES Internal Grants Program	<i>Under Review</i>
2021	Co-PI	Ohio State University CFAES Internal Grants Program	<i>Under Review</i>

2021	Co-PI	North Central Soybean Research Program “Multi-dimensional approaches for improved productivity, sustainability, and management of major soybean diseases in the North Central U.S.”	Year 1 funded: \$500,000
2021	Lead PI	Ohio Soybean Council “Peeling back the underpinnings of virulence”	\$45,000
2018	Awardee	Michigan State University Terry N. & JoAnn L. Turk Endowed Fellowship	\$2,000
2017	Awardee	Michigan State University Writing Fellowship	\$2,000
2015	Lead PI	Kellogg Biological Station LTER Small Grant	\$2,000
2015	Awardee	Michigan State University Plant Science Fellowship	\$8,000
2014	Awardee	Michigan State University – BMS Program Fellowship	\$39,000
2013	Awardee	Grand Valley State University – Focus on the Finish Grant	\$1,000
2013	Awardee	Grand Valley State University – Student Summer Scholars Grant	\$3,000

Grants and Fellowships Not Selected for Funding

<u>Year</u>	<u>Role</u>	<u>Funding Opportunity</u>
2021	Lead PI	National Sunflower Association Pre-Proposal
2021	Co-PI	USDA AFRI (Agricultural Production Systems)
2020	Lead PI	USDA NIFA (EWD Postdoctoral Fellowship)
2017	Co-PI	Michigan State University – Project GREEN
2016	Co-PI	Illumina – Agricultural Greater Good Initiative Grant

HONORS, AWARDS, AND SCHOLARSHIPS

TOTAL SCHOLARSHIP FUNDING GARNERED **\$13,200**

<u>Year</u>	<u>Award Name</u>	<u>\$ Awarded (if applicable)</u>
2019	Paul Taylor Travel Award (APS, Cleveland, OH)	
2019	MSU Genetics Program Student Leadership Award	\$300
2018	Paul Taylor Travel Award (APS, Boston, MA)	
2017	Paul Taylor Travel Award (APS, San Antonio, TX)	
2017	Everett S. “Tex” Beneke Mycology Graduate Student Scholarship	\$1,000
2016	Paul Taylor Travel Award (MPMI, Portland, OR)	
2015	Syngenta Agricultural Scholarship, National winner	\$5,000
2015	Syngenta Agricultural Scholarship, Regional winner	\$1,000
2015	Paul Taylor Travel Award (APS, Pasadena, CA)	
2015	Buckley Creek Ag Services Scholarship	\$1,000
2015	Everett S. “Tex” Beneke Mycology Graduate Student Scholarship	\$900
2014	Outstanding CMB Student Award	
2013	Howard and Rose Stein Biology Scholarship	\$1,000
2013	Waddell Treanor Native Plants Endowment – John Shontz Scholarship	\$3,000

- 2013 Grand Valley Award for Excellence
 2013 Outstanding CMB Student Award
 2012 Outstanding CMB Student Award

PEER REVIEWED PUBLICATIONS

* indicates co-first author

† indicates corresponding author

- 2022 Webster, R.W., **Roth, M.G.**, Mueller, B., Mueller, D.S., Chilvers, M.I., Willbur, J., Mourtzinis, S., Conley, S.P., and Smith, D.L. 2022. Integration of Row Spacing, Seeding Rates, and Fungicide Application for Control of Sclerotinia Stem Rot in *Glycine max*. Plant Disease. DOI: [10.1094/PDIS-09-21-1931-RE](https://doi.org/10.1094/PDIS-09-21-1931-RE).
- 2021 Shao, D., Smith, D.L., Kabbage, M., and **†Roth, M.G.** 2021. Effectors of Plant Necrotrophic Fungi. Frontiers in Plant Science. DOI: [10.3389/fpls.2021.687713](https://doi.org/10.3389/fpls.2021.687713).
- 2021 Zambrana-Echevarría, C., **Roth, M.G.**, Dasgupta, R., German, T.L., Groves, C.L., and Smith, D.L. 2021. Sensitive and specific qPCR and nested RT-PCR assays for the detection of *Tobacco streak virus* in soybean. PhytoFrontiers. DOI: [10.1094/PHYTOFR-11-20-0036-R](https://doi.org/10.1094/PHYTOFR-11-20-0036-R).
- 2021 Webster, R.W., **Roth, M.G.**, Reed, H., Mueller, B., Groves, C.L., McCaghey, M., Chilvers, M.I., Mueller, D.S., Kabbage, M., and Smith, D.L. 2021. Identification of Soybean (*Glycine max*) Check Lines for Evaluating Genetic Resistance to Sclerotinia Stem Rot. Plant Disease. DOI: [10.1094/PDIS-10-20-2193-RE](https://doi.org/10.1094/PDIS-10-20-2193-RE)
- 2021 Geiser, D.M., **et al.** 2021. Phylogenomic analysis of a 55.1 kb 19-gene dataset resolves a monophyletic Fusarium that includes the Fusarium solani Species Complex. Phytopathology. DOI: [10.1094/PHYTO-08-20-0330-LE](https://doi.org/10.1094/PHYTO-08-20-0330-LE)
- 2021 **†Roth, M.G.**, Mourtzinis, S., Gaska, J.M., Mueller, B., Roth, A., Smith, D.L., and Conley, S.P. 2021. Wheat grain and straw yield, grain quality, and disease benefits associated with increased management intensity. Agronomy Journal. DOI: [10.1002/agj2.20477](https://doi.org/10.1002/agj2.20477).
- 2020 ***Roth, M.G.**, *Webster, R.W., Mueller, D.S., Chilvers, M.I., Faske, T.R., Mathew, F.M., Bradley, C.A., Damicone, J.P., Kabbage, M., and Smith, D.L. 2020. Integrated Management of Important Soybean Pathogens of the United States in Changing Climate. Journal of Integrated Pest Management. DOI: [10.1093/jipm/pmaa013](https://doi.org/10.1093/jipm/pmaa013).
- 2020 **Roth, M.G.**, Jacobs, J.L., Napieralski, S., Byrne, A.M., Stouffer-Hopkins, A., Warner, F., Chilvers, M.I. 2020. Fluopyram Suppresses Population Densities of *Heterodera glycines* in Field and Greenhouse Studies in Michigan. Plant Disease. DOI: [10.1094/PDIS-04-19-0874-RE](https://doi.org/10.1094/PDIS-04-19-0874-RE).
- 2020 **Roth, M.G.**, Sang, H., Oudman, K., Jacobs, J.L., Griffin, A., and Chilvers, M.I. 2020. Diagnostic qPCR Assay to Detect *Fusarium brasiliense*, a causal agent of soybean Sudden Death Syndrome and Root Rot of Dry Bean. Plant Disease. DOI: [10.1094/PDIS-01-19-0016-RE](https://doi.org/10.1094/PDIS-01-19-0016-RE).

- 2019 *McCoy, A.G., ***Roth, M.G.**, *Shay, R., *Noel, Z.A., Jayawardana, M.A., Longley, R.W., Bonito, G., and Chilvers, M.I. 2019. Next Generation Sequencing Identification of Fungal Communities Within the Tar Spot Complex of Corn in Michigan. *Phytobiomes*. DOI: [10.1094/PBIOMES-03-19-0017-R](https://doi.org/10.1094/PBIOMES-03-19-0017-R).
- 2019 **Roth, M.G.**, and Chilvers, M.I. 2019. A Protoplast Generation and Transformation Methods for Soybean Sudden Death Syndrome Causal Agents *Fusarium virguliforme* and *F. brasiliense*. *Fungal Biology and Biotechnology*. DOI: [10.1186/s40694-019-0070-0](https://doi.org/10.1186/s40694-019-0070-0).
- 2019 **Roth, M.G.**, Noel, Z.A., Wang, J., Byrne, A.M., Chilvers, M.I. 2019. Predicting Soybean Yield and Sudden Death Syndrome Development using At-planting Risk Factors. *Phytopathology*. DOI: [10.1094/PHYTO-02-19-0040-R](https://doi.org/10.1094/PHYTO-02-19-0040-R).
- 2019 Noel, Z.A., Sang, H., **Roth, M.G.**, and Chilvers, M.I. 2019. Convergent evolution of C239S mutation in *Pythium* spp. β -tubulin coincides with inherent insensitivity to ethaboxam. *Phytopathology*. DOI: [10.1094/PHYTO-01-19-0022-R](https://doi.org/10.1094/PHYTO-01-19-0022-R).
- 2019 Strock, C.F., Schneider, H.M., Galindo-Castañeda, T., Hall, B.T., Van Gansbeke, B., Mather, D.E., **Roth, M.G.**, Chilvers, M.I., Guo, X., Brown, K., and Lynch, J.P. 2019. Laser Ablation Tomography for Visualization of Root Colonization by Edaphic Organisms. *Journal of Experimental Botany*. DOI: [10.1093/jxb/erz271](https://doi.org/10.1093/jxb/erz271).
- 2018 Sang, H., Witte, A., Jacobs, J.L., Chang, H.-X., Wang, J., **Roth, M.G.**, and Chilvers, M.I. 2018. Fluopyram sensitivity and functional characterization of SdhB in the *Fusarium solani* species complex causing soybean sudden death syndrome. *Frontiers in Microbiology*. DOI: [10.3389/fmicb.2018.02335](https://doi.org/10.3389/fmicb.2018.02335).
- 2018 Wang, J., Jacobs, J.L., **Roth, M.G.**, Chilvers, M.I. 2018. Temporal dynamics of *Fusarium virguliforme* colonization of soybean roots. *Plant Disease*. DOI: [10.1094/PDIS-03-18-0384-RE](https://doi.org/10.1094/PDIS-03-18-0384-RE).
- 2018 Chang, H.-X., **Roth, M.G.**, Wang, D., Lightfoot, D.A., Hartman, G.L., Cianzio, S.R., Chilvers, M.I. 2018. Integration of Sudden Death Syndrome Resistance Loci in the Soybean Genome. *Theoretical and Applied Genetics*. DOI: [10.1007/s00122-018-3063-0](https://doi.org/10.1007/s00122-018-3063-0).
- 2016 Kuhlert, S., Austic, G., Zegarac, R., Osei-Bonsu, I., Hoh, D., Chilvers, M.I., **Roth, M.G.**, Bi, K., TerAvest, D., Weebadde, P., Kramer, D.M. 2016. MultispeQ Beta: a tool for large-scale plant phenotyping connected to the open PhotosynQ network. *Royal Society Open Science*. DOI: [10.1098/rsos.160592](https://doi.org/10.1098/rsos.160592).

FORMAL PRESENTATIONS AND POSTERS

Represents first / presenting author only.

Total of 23 presentations.

- 2022 **Roth, M.G.** Gene silencing in the phenylpropanoid pathway improves resistance to sclerotinia stem rot. Soybean Breeders Workshop, St. Louis, MO. ***Online Invited Presentation***

- 2021 **Roth, M.G.** Tapping into the Information Buried in the Soil for Disease Management Decisions. The Ohio State University, Columbus, OH, USA. **Online Invited Presentation**
- 2021 **Roth, M.G.** Dissecting Genetic Mechanisms of Pathogenicity and Resistance for Soybean Yield Protection. The Ohio State University, Columbus, OH, USA. **Online Invited Presentation**
- 2020 **Roth, M.G.** R-Gene mediated susceptibility to *Sclerotinia sclerotiorum* in soybean (*Glycine max*). Plant Cellular and Molecular Biology Supergroup. Madison, WI, USA. **Online Oral Presentation**
- 2019 **Roth, M.G.** Epidemiology and Emerging Technology: New Tools for Understanding Plant Pathogens. Colorado State University, Fort Collins, CO, USA. **Invited Presentation**
- 2019 **Roth, M.G.** Integrating Prediction Models, Molecular Genetics, and “-omics” to Manage Diseases of Field Crops. Colorado State University, Fort Collins, CO, USA. **Invited Presentation**
- 2019 **Roth, M.G.**, and Chilvers, M.I. Studying the *in vitro* interactions between *Fusarium virguliforme* and soil-borne nematodes using fluorescent microscopy. American Phytopathological Society Annual Meeting. Cleveland, OH, USA. **Oral Presentation**
- 2019 **Roth, M.G.** Investigating management and genetics of soybean sudden death syndrome pathogens *Fusarium virguliforme* and *F. brasiliense*. PhD Defense Seminar, Michigan State University. **Oral Presentation**
- 2019 **Roth, M.G.** Investigating Management and Genetics of Soybean SDS Pathogens. Friday at 4 Seminar, University of Wisconsin – Madison. **Invited Presentation**
- 2018 **Roth, M.G.**, Jacobs, J.L., Napieralski, S., Byrne, A., Warner, F., and Chilvers, M.I. Investigating fluopyram as a seed treatment against soybean cyst nematode in the presence of *Fusarium virguliforme*. International Congress for Plant Pathology (ICPP). Boston, MA, USA. **Poster Presentation**
- 2018 **Roth, M.G.**, Chilvers, M.I. Preventing Soybean Yield Losses Caused by *F. virguliforme* and soybean cyst nematode. Genetics and CMB Research Forum. East Lansing, MI, USA. **Oral Presentation**
- 2017 **Roth, M.G.**, Chilvers, M.I. Risk Factors Associated with Sudden Death Syndrome in Soybeans. MSU Plant Pathology Seminar. East Lansing, MI, USA. **Oral Presentation**
- 2017 **Roth, M.G.**, Chilvers, M.I. Root Infection of Soybean (*Glycine max*) and Dry Bean (*Phaseolus vulgaris*) by *Fusarium virguliforme*. International Legume Root Diseases Workshop. East Lansing, MI, USA. **Invited Presentation**
- 2017 **Roth, M.G.**, Chilvers, M.I. Risk factors associated with the development of soybean sudden death syndrome. MSU BioMolecular Sciences Retreat. East Lansing, MI, USA. **Invited Presentation**

- 2017 **Roth, M.G.**, Noel, Z.A., Wang, J., Byrne, A.M., Chilvers, M.I. Assessment and utilization of risk factors in predicting the development of soybean sudden death syndrome. American Phytopathological Society Annual Meeting. San Antonio, TX, USA. **Oral Presentation**
- 2017 **Roth, M.G.**, Noel, Z.A., Chilvers, M.I. Assessment of risk factors for making predictions of soybean sudden death syndrome (SDS) symptom development. Michigan Agri-Business Association Meeting. Lansing, MI, USA. **Oral Presentation**
- 2016 **Roth, M.G.**, Wang, J., Noel, Z.A., Papenfuss, E., Austic, G., TerAvest, D., Yang, Y., Chen, J. Kramer, D.M., Chilvers, M.I. Photosynthesis measurements using PhotosynQ reflects soybean root health and helps predict sudden death syndrome (SDS) symptom development. IS-MPMI Congress. Portland, OR, USA. **Poster Presentation**
- 2016 **Roth, M.G.** Wang, J., Noel, Z.A., Papenfuss, E., Austic, G., TerAvest, D., Yang, Y., Chen, J. Kramer, D.M., Chilvers, M.I. Photosynthesis measurements using PhotosynQ reflects soybean root health and helps predict sudden death syndrome (SDS) symptom development. MSU PhotosynQ Workshop. Michigan State University, East Lansing, MI, USA. **Poster Presentation**
- 2015 **Roth, M.G.**, Rojas, J. A., Wang, J., Chilvers, M.I. A rapid and reliable isothermal diagnostic assay for detecting soybean sudden death syndrome (SDS) pathogen *Fusarium virguliforme*. American Phytopathological Society Annual Meeting. Pasadena, CA, USA. **Poster Presentation**
- 2015 **Roth, M.G.**, Rojas, J. A., Wang, J., Chilvers, M.I. A multiplexed diagnostic assay for detecting *Fusarium virguliforme* and other closely related soybean pathogens. North Central American Phytopathological Society Meeting. East Lansing, MI, USA. **Oral Presentation**
- 2015 **Roth, M.G.**, Rojas, J. A., Wang, J., and Chilvers, M.I. Rapid and reliable isothermal detection of soybean sudden death syndrome (SDS) pathogen *Fusarium virguliforme*. Graduate Academic Conference. East Lansing, MI, USA. **Oral Presentation**
- 2013 **Roth, M.G.**, and Dietrich, M. The role of CBL10 in stamen development in *Arabidopsis thaliana*. West Michigan Regional Undergraduate Science Research Conference. Grand Rapids, MI, USA. **Poster Presentation**
- 2013 **Roth, M.G.**, and Dietrich, M. The role of CBL10 in stamen development in *Arabidopsis thaliana*. Student Summer Scholars Showcase. Allendale, MI, USA. **Poster Presentation**

PROFESSIONAL DEVELOPMENT

- 2020 **Climate change and its impact on the global food system**
Discussion forum held by MSU's "Our Table" program
- 2020 **The Pandemic Effect: Exposing Racism & Inequities,**
Diversity forum held by UW-Madison
- 2020 **Bystander Intervention: Stepping in with Care and Confidence**
Two-day workshop held by UW-Madison

- 2019 **Next Generation Leadership Essentials: Developing Effective Leadership Skills for All Levels**
Leadership Institute Workshop by APS
- 2018 **Certification in College Teaching Institute, MSU**
Two-day workshop covering three major core teaching competencies
- 2015 **Graduate Student Leadership Summit, MSU**
- 2015 **Introduction to Python, MSU ICER workshop**
- 2015 **Responsible Conduct of Research Certificate, MSU**

SOCIETY INVOLVEMENT

- 2022-present **American Phytopathological Society (APS)**
Phytopathology – Associate Editor
- 2021-present **Mycological Society of America (GSA)**
Member
- 2021-present **Genetics Society of America (GSA)**
Member
- 2016-present **Molecular Plant-Microbe Interactions (MPMI)**
1 poster presentation at annual meetings
- 2014-present **American Phytopathological Society (APS)**
Bioengineering Applications Committee Chairperson (2018-2019)
2 oral presentations at annual meetings
3 poster presentation at annual meetings
1 Idea Café session organized
1 Special Session organized (APS 2021)
1 Special Session moderator (APS 2021)
- 2014 – 2018 **American Association for the Advancement of Science**
Member

LEADERSHIP AND COMMITTEE ROLES

- 2017-2020 **American Phytopathological Society (APS)**
APS Council Leadership Fellow (2019)
Bioengineering Applications Committee Immediate Past Chair (2020)
Biotechnology Committee Chair (2018-2019)
Biotechnology Committee Vice-Chair (2017-2018)
- 2015-2019 **MSU Genetics Graduate Student Organization (GSO)**
Outreach Co-Chairperson (2018–2019)
President (2017–2018)
Outreach Chairperson (2015-2017, 2018)
Founder of Outreach Program (2015)
2nd Year Student Representative (2015)

TEACHING AND MENTORSHIP ROLES

MENTORSHIP

As Primary Advisor

Postdoctoral Scholars

2022-present Dr. Collins Tanui, PhD from University of Pretoria, South Africa

Graduate students

2021-present Timothy Siegenthaler, PhD Student

Interns and Undergraduates

[none to date]

As Committee Member

Graduate students

2021-present Hannah Scheppler, PhD Student, Horticulture and Crop Science, OSU

TEACHING

- 2022 **Plant Pathogenic Fungi – The Ohio State University**
PLNTPH 5050 – Guest lecture on distribution, population genetics, and effectors of oomycete pathogens of plants
- 2021 **The Science of Fungi: Mycology – The Ohio State University**
PLNTPH 5040 – Two guest lectures on the lifestyles and co-evolution of plant pathogenic fungi
- 2020 **Plant Pathology Education Online: Best Practices in Developing and Delivering Courses**
Attended course offered by APS to gain advice on teaching strategies to build and deploy online classes in Plant Pathology
- 2019 **Certificate in College Teaching**
Generated teaching philosophy
Attended 2-day teaching institute workshop
Developed and implemented a [mentored teaching project](#)
- 2019 **Graduate Teaching Assistant – Michigan State University**
ZOL 341 – Fundamental Genetics
Course Objective: Demonstrate and clarify approaches to solving genetics problems that require critical thinking
- 2018 **Graduate Teaching Assistant – Michigan State University**
ZOL 341 – Fundamental Genetics
Course Objective: Demonstrate and clarify approaches to solving genetics problems that require critical thinking
Two guest lectures, >150 students each
Student Feedback: “The TA took over for a couple lectures and taught notably better [than the professor].” – anonymous student

- 2016 **Graduate Teaching Assistant – Michigan State University**
 ZOL 341 – Fundamental Genetics
 Course Objective: Demonstrate and clarify approaches to solving genetics problems that require critical thinking
 Student Feedback: “Mitch the TA rocked. He was super easy to talk to and tried to make the material as easy to understand as possible.” – anonymous student

EXTENSION AND OUTREACH

EXTENSION

Publications

- 2021 Roth, M. G., Webster, R. W., Reed, H., Mueller, B., Groves, C. L., McCaghey, M., Chilvers, M. I., Mueller, D. S., Kabbage, M., and Smith, D. 2021. Improved Screening Method for Genetic Resistance to White Mold (Sclerotinia stem rot) in Soybean. Crop Protection Network. CPN 5006.
 DOI: [10.31274/cpn-20210318-1](https://doi.org/10.31274/cpn-20210318-1)
- 2020 Grower-focused [write-up](#) related to publication: Wheat Grain and Straw Yield, Grain Quality, and Disease Benefits Associated with Increased Management Intensity

Events

- 2021 Soybean Research Forum & Think Tank
 2019 Michigan Soybean Promotion Committee Research Update
 2018 Corn Disease Working Group Meeting Presentation on Tar Spot
 2018 Michigan Soybean Promotion Committee Promotional [Video](#)
 2018 Michigan Soybean Promotion Committee Research Update
 2017 Michigan Soybean Promotion Committee Research Update
 2016 Michigan Soybean Promotion Committee Research Update
 2015 Michigan Soybean Promotion Committee Research Update

OUTREACH

As Lead Presenter or Instructor

- 2018 MSU Science Festival
 2017 Grandparents University (MSU)
 2017 MSU Science Festival
 2017 Lansing, MI Charter Academy Science Experience
 2016 Grandparents University (MSU)
 2016 Darwin Discovery Day (MSU)
 2015 Soybean Pathogen Diagnostics Workshop (MSU)
 2015 Ridge Park Charter Academy (Grand Rapids, MI)
 2013 Grandparents, Grandkids, and Grand Valley Camp (GVSU)

As Volunteer

- 2019 Donley Elementary STEAM Night
 2018 Red Cedar School Science Night
 2018 Pincrest School Science Night

STATEMENT OF DIVERSITY

An opportunity is one of the most important things anyone can give or receive. I love the academic setting on college campuses because everyone there is looking for an opportunity to make themselves a better person, make their world a better place, or both. The motivation to find these opportunities is common among students from all ethnicities and cultures. When this motivation is fostered, it can lead to unique collaborations and new solutions to complex problems. I have been given many opportunities in my career, and been mentored by both men and women, older and younger, from numerous cultures and ethnicities. Every opportunity I have been given has been because of someone's effort to include me, and I am proud of the things I have accomplished. However, I recognize that my accomplishments are a culmination of motivation, help, and support from others, in addition to my physical efforts.

Because of these experiences, I am committed to emphasizing inclusion in any position of leadership that I find myself in. I want to include others so that they can have similar experiences like I have and identify their personal skills and weaknesses, learn about new subjects, and find personal satisfaction in their work. I have been able to help others seize opportunities, watch them grow, and make significant advances in their learning and understanding along the way.

During graduate school, I was often approached for help troubleshooting and setting up qPCR experiments. Since PCR and qPCR were some of the first techniques I learned during my undergraduate research experience, I was comfortable talking to others about troubles they might be having with the technique. By taking time to help others with these techniques, I provided an opportunity for them to share their research motivations and articulate what they needed, while also providing guidance towards a solution to the hurdles they faced. Many of these cases moved projects forward and allowed other projects to be finished and written up for publication. I believe that these types of mentoring opportunities should be fostered at universities because they help drive projects forward for all people involved, and most people are at the university to better themselves and the world they live in. I will continue to seek funding to provide more opportunities like these for undergraduate students and under-represented graduate students. By providing opportunities to students, they can gain new perspectives and skills, and by working with them, I will gain new perspectives and skills too.