

CURRICULUM VITAE

Shin-Han Shiu

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Alias	Shinhan Shiu, 徐新漢

Education

09/02-08/05	Postdoctoral Fellow, Department of Ecology and Evolution, University of Chicago. Advisors: Wen-Hsiung Li, Marsha Rosner
01-07/02	Postdoctoral scientist, Inst. for Bioinformatics, Helmholtz Zentrum München, Germany. Advisor: Klaus Mayer
09/94-06/01	Ph.D., Department of Botany, University of Wisconsin-Madison. Advisor: Anthony B. Bleecker. Dissertation: Characterization of the receptor-like kinase TMK1 and molecular evolution of the receptor-like kinase gene family in <i>Arabidopsis thaliana</i>
09/88-07/92	B.S., Department of Plant Pathology, National Taiwan University, Taiwan

Professional experience

01/21-present	Scientific Advisor, PureGene Inc.
09/20-08/21	[Sabbatical] Scientific Advisor, X Company (former Google X)
09/18-present	Director, NSF Research Traineeship Program: IMPACTS - Integrated Training Model in Plant and Computational Sciences, Michigan State University
08/18-present	Professor, Department of Computational Math, Sci, & Engr., Michigan State University
07/17-present	Professor, Department of Plant Biology, Michigan State University
01/17-12/18	Associate Director, Genetics Graduate Program, Michigan State University
07-12/12	[Sabbatical] Visiting Associate Scholar, Biodiversity Center, Academia Sinica, Taiwan
07/11-06/17	Associate Professor, Department of Plant Biology, Michigan State University
01/06-06/11	Assistant Professor, Department of Plant Biology, Michigan State University
01/95-06/00	Nine teaching assistant appointments for five different biology courses at the University of Wisconsin-Madison and Cold Spring Harbor Laboratories.
09/92-06/94	Second lieutenant officer, Army, Taiwan

Awards and honors

2024	Red Ceder Distinguished Professor, Michigan State University
2023	American Association for the Advancement of Science Fellow
2022	Mid-Career Research Award, College of Natural Science, Michigan State Univ.
2008-2009	Lilly Teaching Fellow, Michigan State University
2002-2005	National Research Service Award, National Institute of Health

2000	Fellow for Excellence in Teaching, College of Letters & Science, Univ. of Wisconsin-Madison
1992	Award for Academic Excellence (書卷獎), National Taiwan University, Taiwan

Professional activity

Summary: ([details](#))

Publications	112 publications, 18,170 citations, h-index: 61, i10-index: 90 (Google Scholar).
Extramural grants (details)	15 grants (7 as PI, 13 research and 2 education) since 2006 from three federal agencies, ~\$10 million to Shiu (full amount as PI + fund to lab as coPI).
Conference organization	5 national and international conference organizers or program committee members since 2011. Current: Plant Biology 2023.
Editorial board	Editor/Advisor for six journals since 2006. Current: New Phytologist, PLoS ONE, Science Advances.
Association memberships	5 international and national societies including AAAS (since 2014), ASPB (1998), ISCB (since 2003), SMCBE (since 2002)
Journal and grant reviews	193 manuscripts for 48 journals (9 general biology/science, 4 computational biology, 6 evolutionary biology, 9 genetics/genomics, 17 plant science, and 3 other fields). 89 proposals from 14 countries including 3 US/State, 4 EU, and 12 other international agencies, research fund, and/or universities.
Example service to the broader community (details)	Am Soc of Plant Biologist Program Committee, DOE workshop on AI/ML in bioenergy, NSF Data Science Education Townhall, Workshop on enhancing quantitative education in life science graduate program, Organizer of Cold Spring Harbor Course: Frontier & Techniques in Plant Biology

Statement on diversity, equity, and inclusion

I have the privilege to work with colleagues and students that are diverse in their culture, disability, ethnicity, gender identity, race, sexual orientation, and socioeconomic status. I am committed to creating a research and educational environment that challenges biases and discrimination. I am also committed to promoting equal opportunities as well as making conscientious efforts to ensure that we embrace differences in my capacity as a research scientist, educator, and person. Specifically, I have worked with colleagues in our lab to establish [a six-point diversity, equity, inclusion practice document](#) to ensure that the above goals are achieved.

Research & publications

Long-term research goals

- Understand the molecular basis of plant adaptation under stressful environmental conditions in both natural and agricultural settings via studying the functions and molecular evolutionary patterns of plant genes
- Predict molecular, physiological, and morphological phenotypes in different environmental, spatial, and temporal contexts to prioritize experiments and to better understand molecular mechanisms through integration of multi-modal/scale biological data using computational and data science, machine learning, and artificial intelligence approaches.

- Extract knowledge and infer cause-effect relationships from literature data computationally using natural language processing approaches.

[Link to details](#)

Five selected publications

Bold: lab personnel. *Italicized:* graduate students.

1. **Shiu, SH**, and Bleecker, A. B. (2001). Receptor-like kinases from *Arabidopsis* form a monophyletic gene family related to animal receptor kinases. *Proc Natl Acad Sci U S A* 98, 10763-10768 (cited 1,560 times).
2. Rensing SA,... **Hanada K**,... **Shiu SH**,... Boore JL (70 co-authors). (2008) The genome of the moss *Physcomitrella patens* reveals evolutionary insights into the conquest of land by plants. *Science* 319:64-69 (cited 1,991 times).
3. *Panchy N, Lehti-Shiu M, Shiu SH*. (2016) Evolution of Gene Duplication in Plants. *Plant Physiology*. 171(4):2294-316 (cited 1,036 times).
4. **Moore BM, Wang P**, Fan P, Leong B, Schenck C, *Lloyd J*, Last R, Pichersky E, **Shiu SH** (2019) Robust predictions of specialized metabolism genes through machine learning. *Proc. Natl. Acad. Sci., USA* 116(6):2344-2353 (cited 84 times).
5. **Azodi CB**, Tang J, **Shiu SH**. (2020) Opening the black box: interpretable machine learning for geneticists. *Trends in Genetics* 36(6):442 (cited 209 times).

[Full list](#), [Google scholar](#)

Seminars/Symposium Talks & conference participation

Summary: ([details](#))

Talks	97 since obtaining PhD in 2001, among them: <ul style="list-style-type: none"> • 55 in US and 42 in 12 other countries. • 55 in 51 departments/institutions and 42 in 19 international/national conferences or symposium.
Posters	52 posters since 2005 where 50 are with students and/or postdoctoral scientists as presenters that includes 19 as conference talks.

Teaching, learning, & mentoring

Summary of Teaching Philosophy & goals

My career goal in education is to foster the abilities of the students at all levels for independent, critical thinking particularly in the interface between biological, computational, and quantitative education. To achieve this, my approach is to create a learning environment with scaffolds where the learners actively participate in dialogs with the instructor, exchange opinions in groups, learn by doing, and solve authentic problems. In this environment, the learners practice identifying the core questions and hypotheses, assessing approaches to solutions, designing experiments, analyzing the outcomes, and making interpretations. This approach is what I use to build my core research group, to run the courses I have taught, and to transform introductory genetics and biology class with large enrollments.

Instructional and mentoring activities

Summary: ([details](#))

• Courses taught (excluding guest lectures)	10 courses (2 undergrad and 8 grad-levels), 1046 students (761 undergrads, 255 grads)
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• High school student advisees	11, including 3 received awards/honors.
• Undergraduate student advisees	38, including 18 female, 3 LGBTQ+, and 3 under-represented minority students, 3 received award/honors.
• Graduate student advisees (thesis)	17, including 9 female, and 3 under-represented minority students; received 21 awards/honors.
• Postdoctoral scholars	8, including 5 in academic institutions (3 as faculty, 2 as research associates) and 1 in the industry.
• Graduate thesis committees	62, including 6 M.S. and 56 doctoral.
• Faculty mentees	9 from 4 departments in 3 colleges, 1 from an international institution
• Visting scholar	11 from 5 countries
• Curriculum development examples	Development of >10 courses in MSU and Cold Spring Harbor Lab, and workshops in and out of my home institution.
• Activities for improving teaching and learning	Designing and participating in workshops for improving research training and science education, serving as Lilly Teaching Fellow aiming at scientific teaching.
• Administrative experiences	NSF Research Traineeship Program director, Genetics and Genome Science Program associate director.

Service & outreach

Summary: ([details](#))

University/College /Interdepartmental programs	29 standing/ad hoc committees as members including setting up a new Computational, Math, Sci, & Engr Department, a new Institute of Cyber-Enabled Research, and co-leading cluster-hire in computational genomics.
Departmental committees	25 in career, serving as chair in two, including three department long-rang planning, and four chair searches.
Faculty mentoring committee	8 in career, across four departments in three colleges.
Graduate student committee	58 in career, across departments in three colleges, current 17.
Visiting scholar	11 since 2006 from five countries.
Other major outreach activities	Our outreach goals are to help the public to better understand the process of science, to inspire the next generation in STEM careers, and to improve diversity, equity and inclusivity in my lab, institution, and my research field. Since 2006, we have designed and engaged in activities in nine venues.

APPENDIX

Professional activities

Scientific conference organization

9/18 - 8/23	Program Committee, American Society of Plant Biologists
12/18 - 5/19	Conference organizer, Evolution and core process in gene expression, East Lansing, MI (American Society of Biochemistry and Molecular Biology)
12/11 - 5/12	Program Committee, Great Lake Bioinformatics Conference 2012, Ann Arbor, MI (International Society for Computational Biology)

Publication and editorial

1/24-present	Academic Editor, Science Advances
6/21-5/22	Guest editor, Frontiers in Artificial Intelligence, "Artificial Intelligence and Machine Learning applications in Plant Genomics and Genetics"
1/18-present	Board of Advisor, New Phytologist
1/12-12/17	Monitoring Editor, Plant Physiology
1/12-6/15	Reviewing Editor, Frontier in Plant Systems Biology
1/06-current	Academic Editor, PLoS ONE

Association memberships

2014-present	Member, American Association for the Advancement of Science
2012-present	Member, Taiwan Society of Evolution and Computational Biology
2003-present	Member, International Society for Computational Biology
2002-present	Member, Society for Molecular Biology and Evolution
1998-present	Member, American Society of Plant Biologists

Journal and grant reviews

Journal reviewer	<p><i>General biology:</i> Biol. Lett., eLife, Nature Biotechnol., Nature Comm., Nature Rev. Genet., Phil. Trans. Royal Soc. B, PLoS ONE, Proc. Natl. Acad. Sci. USA, Science Adv.</p> <p><i>Computational biology:</i> Bioinformatics, Nucleic Acid Res., NAR Genomics & Bioinform., PLoS Comp Biol</p> <p><i>Evolution:</i> BMC Evol. Biol., G3, Gene, Genome Biol & Evol., J. of Mol. Evol., Mol. Biol. & Evol., Mol. Phylogenet. & Evol.</p> <p><i>Genetics & genomics:</i> BMC Genomics, DNA Cell Biol., G3, Genetica, Genetics, Genome Biol., Genome Res., PLoS Genetics, Theor. Appl. Genet.</p> <p><i>Plant science:</i> Am. J. Bot., BMC Plant Biol., Curr. Opin. Plant Sci., Int. J. of Plant Sci., J. of Exp. Botany, New Phytologist, Phytochemistry, Planta, Plant Biotech. J., Plant Cell, Plant Cell & Physiol., Plant Genome, Plant Mol. Biol., Plant Physiol., Plant Sci., Rice, Trends in Plant Sci.</p> <p><i>Others:</i> Biological Procedures, Biotech. For Biofuels, CBE-Life Sci. Edu.</p>
Grant/award reviewer	<p><i>US - NSF, USDA, Kentucky Sci & Eng Foundation</i></p> <p><i>EU - ERA-CAPS, ERA-COG, ERA-NET Plant Genomics, Plant-KBBE</i></p> <p><i>Canada - Natural Sciences and Engineering Research Council</i></p> <p><i>Czech Republic - Czech Academy of Science (Akademie věd České republiky)</i></p> <p><i>Austria - Austrian Science Fund</i></p> <p><i>Belgium - Research Foundation - Flanders (Fonds Wetenschappelijk Onderzoek - Vlaanderen)</i></p>

France – ANR (Agence Nationale Recherche)
Germany – Federal Ministry of Education and Research (Bundesministerium für Bildung und Forschung)
Israel – German-Israeli Foundation
New Zealand – Royal Society of New Zealand Marsden Fund
Netherlands – Dutch Research Council (Nederlandse Organisatie voor Wetenschappelijk Onderzoek), Wageningen University,
Poland – National Science Centre
Switzerland – Swiss Federal Institute of Technology Zurich (Eidgenössische Technische Hochschule Zürich)
Taiwan – Academia Sinica, Ministry of Science & Technology, National Science and Technology Council
Panelist US – NSF (2 times)
Taiwan – Academia Sinica (3 times),

Service to the broader community

3/23 – present	DOE: Biological & Env Res Advisory Committee	A subcommittee member on exploratory effort to improve data interoperability and usefulness
8/23/22	DOE: AI/ML for BioEnergy Research	A participant and discussion facilitator for the workshop on how best to AI/ML can be use for bioenergy research
1-2/22	Ministry of Science & Technology, Taiwan	Reviewer for outstanding research award
4/26/22	NSF Rule of Life workshop	Providing feedbacks to NSF on how AI and data science can be leveraged to better understand rules of life.
2/21/22	ASPB Webinar: Strategies for Writing Better Abstracts	A panelist to share our experiences on what makes an abstract compelling and engaging and how to appeal to the broad audience expected at scientific meetings.
10/21-12/22	IUBMB EC Nomenclature Subcommittee on protein kinases	The task of the subcommittee is to better parse, and allocate EC numbers to, distinct classes of protein kinase. I serve as the plant kinase expert.
10/8/21	Data Science Education Town Hall	A panelist for the virtual town hall organized on behalf of NSF Directorate for Education and Human Resources. This town hall is intended to stimulate discussion on the definition of “data science”, related ethical issues, teaching and learning of concepts and skills, and issues of justice, equity, diversity, and inclusion related to data science.
7/18/21	Workshop on Enhancing Plant Science Education through the NSF National Research Traineeships	A panelist for this workshop held during the Plant Biology 2021 meeting where four Directors of NSF Research Traineeship Programs with plant science foci were tasked to introduce the pedagogical innovations in educating graduate students to be at the interface between plant science and other disciplines.
12/1-3/20	Workshop on Quantitative Education in Life Science Graduate Programs	Participant. This Workshop brings together a diverse group of researchers and educators working at the interface of various areas of the life sciences and quantitative science. It is funded by Burroughs Wellcome Fund and from the National Science Foundation, the National Institute for Mathematical and Biological Synthesis in partnership with the Southeast Center for Mathematics and Biology.

8/6/19, 7/29/20	Machine learning workshop	Organizer and instructor, workshop titled "How Machine Learning Can be Used to Plant Biology Problems" for >100 attendees in Plant Biology 2019 and 2020 meetings.
4/16/19	Biology-on-tap	Speaker introducing big data in biology to a lay audience of ~100 over beer and food.
7/18-present	Program Committee, American Society of Plant Biologists	One of 7-9 committee members, the Program Committee is responsible for planning, arranging, and publicizing the annual meetings of the Society, and particularly during the COVID-pandemic period, responsible for changes in meeting modalities.
9/15-2022	Genetics Expert News Service (GENeS)	GENeS is a non-profit organization proactively delivers scientific expertise to journalists covering genetics and biotechnology. I serve as one of the experts to provide inputs to news stories.
01/13-15	Cold Spring Harbor Course: Frontier & Techniques in Plant Biology	One of the three organizers for the course, my task includes recruiting ~20-30 renowned scientists to give lectures, screening high quality students (graduate students, faculty, and/or industry participants), planning and running labs, and organizing activities for students.
11/5/13	Intl. Sym. on Evol. Genomics & Bioinformatics	A judge for the best oral presentations.
9/19/12	International Symposium on Root Systems Biology	A judge for the best posters.
10/11	iPLANT workshop in MSU	Co-organized a workshop to bring in iPLANT personnel to introduce iPLANT computing resources
09/11-14	ISCB Great Lakes Bioinformatics Program Committee	Committee member selecting abstracts for oral presentation.
11/5/10	University of Wisconsin Career Symposium	Panel member to provide advice to graduate students about dealing with challenges and making the most out of graduate school.
9/4/08	iPlant Grand Challenge Workshop	"Technology super-user" offering advice in a Grand Challenge Workshop of the NSF-funded iPLANT collaborative.
6/06-5/07	National Evolutionary Synthesis Center	Workgroup on Plant Evolutionary Genomics - I was one of the participants discussing drafting reporting standard for studies of gene families.

Extramural Grants

1/23-12/25	NSF IOS-2218206 , RESEARCH-PGR: Combining machine learning and experimental analysis to define trichome and root-specific gene regulatory networks in cultivated tomato and related Solanaceae species. PI: Shin-Han Shiu . Co-PI: Rachel Kerwin, Robert L. Last. (\$1,800,000 total)
12/22-11/27	DOE DE-SC0018409 (renewal) Great Lakes Bioenergy Research Center. PI: Timothy Donohue. (thus far, \$50,000 to Shiu)
7/22-6/25	NSF MCB-2210431 , Assessing the connections between genetic interactions, environments, and phenotypes in Arabidopsis thaliana. PI: Shin-Han Shiu . Co-PI: Melissa Lehti-Shiu. (\$900,000 total)
12/21-11/24	NSF IOS-2107215 , TRTech-PGR: Connecting sequences to functions within and between species through computational modeling and experimental studies. PI:

- Shin-Han Shiu.** Co-PI: Melissa Lehti-Shiu, Jiliang Tang, Yuying Xie. (\$1,400,000 total)
- 09/18-08/24 [NSF DGE-1828149](#), NRT-HDR: Intersecting computational and data science to address grand challenges in plant biology (with extension). PI: **Shin-Han Shiu.** Co-PI: Karen Cichy, Tammy Long, Brian O'Shea, Erich Grotewold. (\$2,999,000 total).
- 12/17-11/22 [DOE DE-SC0018409](#) Great Lakes Bioenergy Research Center. PI: Timothy Donohue. (\$520,000 to Shiu)
- 04/17-03/22 [NSF DEB-1655386](#), Fitness effects of loss-of-function mutations in duplicate. PI: **Shin-Han Shiu.** Co-PI: Jeffery Conner (\$409,860 to Shiu, \$594,000 total).
- 08/16-07/21 [NSF IOS-1546617](#), RESEARCH-PGR: How do plants produce so many diverse metabolites: A computational and experimental comparative genomics investigation in the Solanaceae.
PI: Rob Last. Co-PIs: Cornelius Barry, Daniel Jones, Eran Pichersky, **Shin-Han Shiu.** (\$797,337 to Shiu, \$6,419,963 total)
- 07/15-07/20 [USDA NIFA 2015-38420-23697](#), Cross -disciplinary training to improve food security in a changing environment - integrating genetics, computational analysis, and policy considerations.
PI: Catherine Ernst. Co-PIs: Ronald Bates, Hans Cheng, Rebecca Grumet, Susanne Hoffman-Benning, Gregg Howe, **Shin-Han Shiu,** Juan Steibel, Robert Templeman, Dechun Wang. (\$262,500 total)
- 11/11-10/16 [NSF IOS-1126998](#), IPGA: Developing an effective, portable annotation engine for plant genomes.
PI: Mark Yandell. Co-PIs: Kevin Childs, Ning Jiang, **Shin-Han Shiu,** Yanni Sun. (\$544,695 to Shiu, \$3,626,169 total)
- 09/11-08/16 [NSF MCB-1119778](#), Computational and experimental studies of plastid functional networks.
PI: **Shin-Han Shiu.** Co-PI: Rob Last. (\$582,670 to Shiu, \$1,222,200 total)
- 11/09-09/16 [NSF DEB-0919452](#), Genetic mechanisms of rapid adaptive evolution in an outbred natural population.
PI: Jeff Conner. Co-PIs: Ian Dworkin, **Shin-Han Shiu.** (\$96,533 to Shiu, \$940,228 total)
- 08/09-09/13 [NSF MCB-0929100](#), *Arabidopsis* 2010: Functional Analysis of Ubiquitin-Protein Ligase (E3) Families in *Arabidopsis*.
PI: Richard Vierstra. Co-PIs: Xing-Wang Deng, Mark Estelle, Judy Callis, **Shin-Han Shiu.** (\$160,490 to Shiu, \$4,675,380 total)
- 09/09-08/12 [NSF DBI-0923149](#), MRI: Acquisition of Laser Capture Microdissection Instrumentation for Michigan State University.
PI: Robert Day. Co-PI: Markus Pauly, Federica Brandizzi, **Shin-Han Shiu,** Yair Shachar-Hill. (\$211,758 total)
- 03/08-02/12 [NSF MCB-0749634](#), Experimental Characterization of Novel Coding Small ORFs in the *Arabidopsis thaliana* Genome.
PI, **Shin-Han Shiu.** (\$500,000 total)
- 12/06-11/10 [NSF IOS-0638591](#), Comparative cDNA Sequencing in Radish (*Raphanus*), a Crop, Weed, and Model System in Ecology and Evolution.
PI: Jeff Conner. Co-PI: **Shin-Han Shiu,** Yongli Xiao. (\$139,692 to Shiu, \$1,126,847 total)

Grant: serving as major collaborator/contributor/participant

- 5/14-present NIH T-32; Plant Biotechnology for Health and Sustainability Predoctoral Training Grant
PI: Robert Last I served as one of 23 trainers of the program.

3/10-present	NSF DBI-1757043; REU SITE: Plant Genomics @ Michigan State University PI: Cornelius Barry	I am a participant of the REU program hosting students from the program.
5/15-4/18	NSF MCB-1518078; Cold Spring Harbor Laboratory Course: Frontiers and Techniques in Plant Science PI: David Stewart	I wrote a funded proposal for the course with two other instructors. For administrative reasons, the CSHL meeting/course director serves as the PI.
4/15-3/19	Exxon-Mobil Chemical Company; MSU-EMRE Collaboration: Improving Algal Photosynthetic Efficiency PI: David Kramer	I served as a funded collaborator contributing expertise in molecular evolution and computational biology and has budgeted support for a graduate student over the funding period.
9/14-8/17	NSF, DBI-1358474; REU SITE: Plant Genomics at Michigan State University PI: Cornelius Barry	I am a participant of the REU program hosting students from the program.
1/13-12/15	Academia Sinica, Taiwan; Rice productivity improvement project. PI. Wen-Hsiung Li	This is a research project funded with \$1.2 million over 3 years with 3 subprojects. I developed/wrote >60% of the entire project during my sabbatical and served as a non-funded co-PI.
8/10-7/20	NSF, DBI-0939454; BEACON: an NSF Science & Technology Center for the Study of Evolution in Action. PI. Erik D. Goodman	I served as one of 76 scientists in the Evolution of Genomes, Networks, and Evolvability group of the multi-institutional center.
9/10-8/13	NSF, DBI-1004425; REU Site: Plant Genomics at Michigan State University PI: Robert Last	I am a participant of the REU program and have hosted four students from the program.
1/10-12/11	NSF, DBI-0959894; Acquisition of Data Intensive Academic Grid PI: Owen White	I served as one of 26 collaborators, provided expertise in evolutionary computation, and received guaranteed access to the Grid.
7/07-6/11	NSF, IOS-0701709; Low temperature transcriptional networks. PI: Michael Thomashow	I served as a funded collaborator contributing expertise in molecular evolution and computational biology.

Research foci and publications

Current research foci

Evolution of genome contents – how did genome evolve and what were the drivers?

- *Evolution of duplicate genes*: How do gene functions evolve after duplication? What are the factors/mechanisms contribute to duplicate retention?
- *Evolution of environmental response*: To what extent do environmental responses diverge within and between species? How does such response divergence contribute to adaptation? What are the molecular mechanisms underlying divergence in environmental response?

Signal vs. noise – which genomic features are 'functional'?

- *Evolution of molecular activities*: What is the evolutionary significance of a measurable biochemical activity, e.g. transcription, in a cell? Particularly, what is the significance of expression in “intergenic” space?

- Defining functional genomic regions: How may we integrate functional and comparative genomic data to define functional regions?

From genotype to phenotype – how can we translate genomic information into phenotypes?

- Transcriptional regulatory model: What are the major factors influencing transcriptional regulation under diverse environmental conditions? How may we integrate these factors to establish models predictive of gene expression in a spatial, temporal, and condition-specific manner?
- Predicting phenotypes based on genetic, epigenetic, and other omics variation data: How may we integrate genotype/epigenotype information, functional genomic data, and/or other types of information to predict molecular functions, physiological response, and morphological characteristics in a specific environmental, spatial, and temporal context?

Natural language processing – how can we better extract knowledge from literature data?

- Plant science knowledge graph: What are the key entities (e.g., gene, enzyme, chemical, pathway, or concept) in plant science literature? How are these entities connected with each other? How may we infer cause-effect relationships between entities?
- History of scientific development: How can we identify key topics (i.e., fields) of research using literature data? Based on chronological information, how did major topics come about and evolve over time?

Publication list

*: Joint first/corresponding. **Bold**: lab personnel. *Italicized*: graduate students. Underlined: undergrad/high school students

1. Lotreck SA, *Segura Abá K*, **Lehti-Shiu MD**, Seeger A, *Brown BNI*, *Ranaweera T*, Schumacher A, Ghassemi M, **Shiu SH** (2023) In a PICKLE: A gold standard entity and relation corpus for the molecular plant sciences. *In Silico Plants* diad021 [doi](#)
2. Alzohairy SA, *Moore BM*, Hammerschmidt R, **Shiu SH**, Hausbeck MK (2023) Lignin biosynthesis gene expression is associated with age-related resistance of winter squash to *Phytophthora capsici*. *J Am Soc Hort Sci* 148:240-252 [doi](#)
3. Li Y, Miyani B, Childs KL, **Shiu SH**, and Xagorarakis I. Effect of wastewater collection and concentration methods on assessment of viral diversity. *Sci Total Environ* 2023:168128 [pubmed](#)
4. Lee YS, **Shiu SH**, and Grotewold E (2023) Evolution and diversification of the ACT-like domain associated with plant basic helix–loop–helix transcription factors *Proc. Natl. Acad. Sci. USA* 120(19):e2219469120
5. US DOE (2023) Artificial Intelligence and Machine Learning for Bioenergy Research: Opportunities and Challenges, DOE/SC-0211. U.S. Department of Energy Office of Science and Office of Energy Efficiency and Renewable Energy. [doi](#) (**Shiu SH** Biodesign: Plant group)
6. Cuddington K, Abbott KC, Adler FR, Aydeniz M, Dale R, Gross LJ, Hastings A, Hobson EA, Karatayev V, Killion A, Madamanchi A, Marraffini ML, McCombs A, Samyono W, **Shiu SH**, Watanabe KH, White ER (2023) Challenges and opportunities to build quantitative self-confidence in biologists. *Bioscience* 73:364 [doi](#)
7. Noble JA, Bielski NV, Liu MJ, DeFalco TA, Stegmann M, Nelson ADL, McNamara K, Sullivan B, Dinh KK, Khuu N, Hancock S, **Shiu SH**, Zipfel C, Cheung AY, Beilstein MA, Palanivelu R. (2022) Evolutionary analysis of the LORELEI gene family in plants reveals regulatory subfunctionalization. *Plant Physiol.* 190(4):2539
8. *Ranaweera T*, *Brown BNI*, **Wang P**, **Shiu SH** (2022) Temporal Regulation of Cold Transcriptional Response in Switchgrass. *Frontier in Plant Sci* 13:998400
9. Lucker BF, Temple JA, **Panchy NL**, Benning UF, BibikaPeter JD, Neofotis PG, Weissman JC, Baxter IR, **Shiu SH**, Kramer DM (2022) Selection-enriched genomic loci (SEGL) reveals genetic loci for

- environmental adaptation and photosynthetic productivity in *Chlamydomonas reinhardtii*. *Algal Res* 64:102709
10. van Dijk ADJ, **Shiu SH**, de Ridder D (2022) Editorial: Artificial Intelligence and Machine Learning Applications in Plant Genomics and Genetics. *Front Artif Intell.* 5:959470
 11. **Wang P, Meng F, Donaldson P, Horan S, Panchy NL, Vischulis E, Winship E**, Conner JK, **Shiu SH, Lehti-Shiu MD** (2022) High throughput measurement of plant fitness traits with an object detection method using Faster R-CNN. *New Phytologist* 234:1521–1533
 12. **Wang P, Schumacher AM**, Shiu SH (2022) Computational prediction of plant metabolic pathway. *Curr Opin Plant Biol* 66:102171
 13. **Moore BM**, Lee YS, Grotewold E, **Shiu SH** (2022) Modeling gene regulation in response to wounding: temporal variations, hormonal variations, and specialized metabolism pathways induced by wounding. *Plant Cell* 34(2):867-888
 14. Noble JA, **Seddon A, Uygun S**, Bright A, Smith SE, **Shiu SH**, Palanivelu R. (2021) The SEEL motif and members of the MYB-related REVEILLE transcription factor family are important for the expression of LORELEI in the synergid cells of the Arabidopsis female gametophyte. *Plant Reprod.* 35(1):61-76.
 15. Dale R, Oswald S, Jalihal A, Laporte M, Fletcher DM, Hubbard A, **Shiu SH**, Nelson ADL, Bucksch A. (2021) Overcoming the challenges to enhancing experimental plant biology with computational modeling. *Frontier in Plant Sci.* 12:687652.
 16. **Cusack SA, Wang P, Lotreck SG, Moore BM, Meng F**, Conner JK, Krysan PJ, **Lehti-Shiu MD, Shiu SH**. (2021) Predictive models of genetic redundancy in Arabidopsis thaliana. *Mol. Biol. & Evol.* 38(8):3397.
 17. **Wang P, Moore BM, Uygun S, Lehti-Shiu M**, Barry C, **Shiu SH**. (2021) Optimizing the use of gene expression data to predict plant metabolic pathway memberships. *New Phytologist* 231(1):475
 18. **Wang PP, Meng FR, Moore BM, Shiu SH**. (2021) Impact of short-read sequencing on the misassembly of a plant genome. *BMC Genomics* 22(1):99
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Research talks and posters

Seminars/Symposium Talks

1/31/24	Dept of Soil & Crop Sciences, Colorado State University, Fort Collins, CO
12/9/23	Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, Shenzhen, China (virtual)
9/8/23	Plant Genome Research Program Symposium, National Science Foundation, Alexandria, DC
7/11/23	Institute of Plant & Microbial Science, Academia Sinica, Taipei, Taiwan
2/13/23	Next Plant Symposium, Heinrich-Heine-University, Düsseldorf, Germany
11/15/22	Department of Biology, Spelman College, Atlanta, GA (virtual)
10/27/22	Dept Horticulture, Purdue University, West Lafayette, IN (graduate student invited speaker)
9/14/22	Zurich-Basel Plant Science Center, Zurich, Switzerland
3/17/22	Center of Comparative Genomics, Dalhousie University, Nova Scotia, Canada
10/16/21	Dept Biology, University of Iowa, Ames, IA
10/06/21	NEXT Plant Symposium – University of Dusseldorf/MSU, virtual
03/29/21	Dept Plant Biology, University of California-Davis, Davis, CA
10/27/20	Dept Biochemistry, Purdue University, West Lafayette, IN
09/29/20	Dept Plant & Microbial Biol, University of Minnesota, Twin City, MN (postdoctoral scientist invited speaker)
02/18/20	Dept Biochem, Cell, Mol. Biol, University of Tennessee, Knoxville, TX
01/11/20	Plant and Animal Genome meeting (workshop speaker)
08/03/19	Plant Biology Meeting, San Jose, CA (session speaker)
06/25/19	Dept Biological & Environmental Sciences, University of Helsinki, Finland
05/21/19	Great Lake Bioenergy Research Ctr, Annual Science Meeting, Lake Geneva, WI
01/02/19	Biotechnology Center in Southern Taiwan, Tainan, Taiwan
04/06/17	Joint Genome Institute, Walnut Creek, CA

08/26/16 Dept Mol Biol, Cell Biol, & Biochem., Brown University, *Providence, RI*
 07/16/16 Plant Biology Meeting, *Austin, TX* (session chair & speaker)
 04/11/16 Department of Biological Sciences, Wayne State University, *Detroit, MI*
 01/09/16 Plant and Animal Genome 2016, *San Diego, CA*
 12/08/15 Dept Horticulture & Crop Protection, Yangzhou University, *Yangzhou, China*
 12/07/15 Dept Vegetable Crop, Nanjing Agricultural University, *Nanjing, China*
 09/14/15 The 3rd Plant Genomics Congress, *St Louis, MO*
 06/01/15 Inst of Plant Protection, Chinese Academy of Agricultural Sci., *Beijing, China*
 05/26/15 Institute of Botany, Chinese Academy of Sciences, *Beijing, China*
 03/31/15 Biosystematics Group, Wageningen University & Research Center, *Wageningen, Netherland*

 03/05/15 Dept Microbiology & Plant Biology, University of Oklahoma, *Stillwater, OK*
 01/10/15 Plant and Animal Genome 2015, *San Diego, CA*
 10/17/14 Institute of Botany, Chinese Academy of Sciences, *Beijing, China*
 10/13/14 Chinese Academy of Agricultural Sciences, *Beijing, China*
 04/05/14 IGERT symposium, University of Arizona, *Tuscon, AZ*
 11/11/13 Taiwan Intl. Graduate Prog. & Biodiversity Program Seminar, *Taipei, Taiwan*
 11/08/13 Intl. Sym. on Evol. Genomics & Bioinformatics, *Taichung, Taiwan*
 07/20/13 Plant Biology Meeting, *Providence, RI* (session chair & speaker)
 03/19/13 Dept Plant Pathology, University of Florida, *Gainesville, FL* (canceled, weather)
 03/06/13 Conference on the evolution of plant metabolic diversity, *Banbury, NY*
 11/22/12 Dept. Life Sciences, National Cheng Kung University, *Tainan, Taiwan*
 10/25/12 Dept. Plant Pathology & Microbiol, National Taiwan Univ., *Taipei, Taiwan*
 10/19/12 Symp. on Evol. Genomics & Bioinform., Natl. Sun Yat-Sen Univ, *Kaohsiung, Taiwan*
 10/04/12 Dept. Ind. Plant Sci. & Technol., Chungbuk National Univ., *Chungbuk, Republic of Korea*

 09/28/12 Inst. Molecular Biology, National Chung Hsing University, *Taichung, Taiwan*
 09/19/12 Intl. Symposium on Root Systems Biology Symposium 2012, *Taipei, Taiwan*
 09/05/12 Institute of Plant and Microbial Biology, Academia Sinica, *Taipei, Taiwan*
 06/29/12 Plant Molecular Genetics Course, Cold Spring Harbor Lab, *Long Island, NY*
 05/15/12 Great Lakes Bioinformatics Conference, *Ann Arbor, MI*
 04/19/12 Ctr. Genome Res. & Biocomputing, Oregon State University, *Eugene, OR*
 04/03/12 Dept. Biochem., Cell. & Mol. Biol., University of Tennessee, *Knoxville, TN*
 01/14/12 Ubiquitin 2010, University of Washington, *Seattle, WA*
 11/06/11 The 9th Intl. Symposium on Rice Functional Genomics, *Taipei, Taiwan*
 09/29/11 Plant Phosphorylation Workshop, *Lake Tahoe, CA*
 08/02/11 Plant Science Center, RIKEN, *Yokohama, Japan*
 08/01/11 Young Researchers Conference on Evolutionary Genomics, *Tokyo, Japan*
 07/22/11 Sym. on Transcriptional Dyn., Evol., & Syst. Biol., *East Lansing, MI*
 07/13/11 Plant Mol. Genet. Course, Cold Spring Harbor Laboratory, *Long Island, NY*
 06/22/11 Int. Conf. on *Arabidopsis* Research, University of Wisconsin, *Madison, WI*
 05/02/11 Great Lakes Bioinformatics Conference, Ohio University, *Athens, OH*
 01/23/11 Keystone Symposium: Evolution of Protein Phosphorylation, *Keystone, CO*
 10/16/10 Ubiquitin 2010, Yale University, *New Haven, CT*
 06/15/10 Agricultural Biotech. Research Center, Academia Sinica, *Taipei, Taiwan*
 06/11/10 Dept. Plant Pathol. & Microbiol., National Taiwan University, *Taipei, Taiwan*
 05/31/10 Biotechnology Center in Southern Taiwan, Academia Sinica, *Tainan, Taiwan*
 12/12/09 Ubiquitin 2010, University of California at San Diego, *San Diego, CA*
 12/11/09 Salk Institute, *San Diego, CA*
 10/31/08 Dept. of Biology, Dartmouth College, *Hanover, NH*

08/03/08	Ohio Collaborative Conf. in Bioinformatics, University of Toledo, Toledo, OH
05/12/08	Plant Science Center, RIKEN, Yokohama, Japan
05/07/08	Agricultural Biotech. Research Center, Academia Sinica, Taipei, Taiwan
01/18/08	Kellogg Biological Station, Michigan State University, Kalamazoo, MI
11/16/07	Ctr. Comparative Genomics, Univ. of Copenhagen, Copenhagen, Denmark
11/15/07	Dept. of Molecular Biosciences, University of Oslo, Oslo, Norway
06/24/07	Soc. for Mol. Biol. and Evol. Meeting, Dalhousie University, Halifax, Canada
05/21/07	The Annual Missouri Symposium, University of Missouri, Columbia, MO
12/09/06	Rice Annot. Proj. Meeting 3, Natl. Inst. of Agrobiological Sci., Tsukuba, Japan
11/02/06	Plant Phosphorylation Meeting, Asilomar, CA
06/25/06	Plant Science Institute Symposium, Iowa State University, Ames, IA
11/04/05	Plant Phosphorylation Meeting, Snowbird, UT
06/15/05	Intl. Conf. on <i>Arabidopsis</i> Research, University of Wisconsin, Madison, WI
01/26/05	Dept. of Plant Biology, Michigan State University, East Lansing, MI
01/19/05	Dept. of Biology, Miami University, Miami, OH
01/12/05	Dept. of Biology, State University of New York, Buffalo, NY
06/24/04	Plant Biology Meeting, Orlando, FL
06/19/04	Soc. of Mol. Biol. & Evol. Meeting, Penn. State University, State College, PA.
06/03/04	Dept. of Biology, University of Washington, Seattle, WA
03/04/04	Dept. of Biology, San Francisco State University, San Francisco, CA
09/08/03	Genome Research Center, Natl. Yang Ming Univ., Taipei, Taiwan
06/20/03	Intl. Conf. on <i>Arabidopsis</i> Research, University of Wisconsin, Madison, WI.
05/28/03	Plant Phosphorylation Meeting, University of Missouri, Columbia, MO.
12/19/02	Dept. of Botany, University of Toronto, Toronto, Canada
12/02/01	Friedrich Miescher Institute, Basel, Switzerland
11/29/01	MIPS/Institute of Bioinformatics, GSF, Munich, Germany
07/07/01	Society of Molecular Biology & Evolution, University of Georgia, Athens, GA.
06/24/01	Intl. Conf. on <i>Arabidopsis</i> Research, University of Wisconsin, Madison, WI

Poster and oral presentation in meetings by lab personnel

*: ASBMB, American Society of Biochemistry & Molecular Biology; ASPB, American Society of Plant Biologists; GLBIO, Great Lakes Bioinformatics Conference; GLBRC, Great Lake Bioenergy Research Center; ICAR: International Conference on *Arabidopsis* Research; ISMB, Intelligent System for Molecular Biology; SMBE: Society for Molecular Biology and Evolution; SSE: Society for the Study of Evolution

05/17/22	GLBRC Annual Science Meeting <ul style="list-style-type: none"> • Genomic prediction of yeast fitness in different environments. Poster: <u>Segura Abá</u>, Ding, Shiu • Temporal regulation of cold transcriptional response in switchgrass. Poster: <u>Ranaweera</u>, Brown, Wang, and Shiu
1/1/20- 12/31/21	Due to the COVID-19 pandemics, turnover of lab personnel, and my sabbatical leave, no meeting attendance during this period.
08/02/19	Plant Biology 2019, San Jose, CA <ul style="list-style-type: none"> • Transcriptome-based prediction of complex traits in maize. Poster: <u>Azodi</u>, Bolger, McCarren, Roantree, de Los Campos, Shiu • Impact of sequencing strategies, variant types, and ploidy levels on genomic prediction in switchgrass. Talk: <u>Wang</u>, Meng, Azodi, Shiu
08/08/18	BEACON Congress, East Lansing, MI <ul style="list-style-type: none"> • Modeling degrees of genetic redundancy among paralogs in <i>Arabidopsis thaliana</i>. Talk: <u>Cusack</u>, Meng, Wang, Moore, Donaldson, Lehti-Shiu, Conner, Krysan, Shiu

- 07/16/18 Plant Biology 2018, Montreal, QC, Canada
- Modeling degrees of genetic redundancy among paralogs in *Arabidopsis thaliana*. Talk: Cusack, Meng, Wang, Moore, Donaldson, Lehti-Shiu, Conner, Krysan, Shiu
 - Signatures and predictions of specialized metabolism genes in *Solanum lycopersicum*. Talk: Moore, Wang, Fan, Leong, Schneck, Sugimoto, Barry, Last, Pichersky, Shiu
- 07/16/18 ISCB 2018, Chicago, IL
- Predicting complex traits from genetic information using machine learning. Poster: Azodi, Meng, Wang, de los Compos, Shiu
 - Conservation and duplication patterns of domain families in Solanaceae species. Poster: Wang, Moore, Shiu
- 04/30/18 Ecology, Evolutionary Biology, and Behavior Program Symposium, East Lansing, MI
- Modeling degrees of genetic redundancy among paralogs in *Arabidopsis thaliana*. Talk: Cusack, Meng, Wang, Moore, Donaldson, Lehti-Shiu, Conner, Krysan, Shiu
- 08/03/17 BEACON Congress, East Lansing, MI
- Predicting specialized metabolism genes using a machine-learning approach in *Arabidopsis thaliana*. Talk: Moore, Wang, Lloyd, Panchy, Shiu
- 06/20/17 ICAR, St Loise, MO
- Uncovering the cis-regulatory code of plant response to combined abiotic stress using multi-dimensional data integration and machine learning. Talk: Azodi, Uygun, O'Malley, Shiu
 - Asymmetric evolution of the transcription profiles and cis-regulatory sites contributes to the retention of transcription factor duplicates. Talk: Panchy, Azodi, Winship, O'Malley, Shiu.
- 06/14/17 Plant Biology 2017, Honolulu, HI
- Predicting specialized metabolism genes using a machine-learning approach in *Arabidopsis thaliana*. Poster: Moore, Wang, Lloyd, Panchy, Shiu
- 01/25/17 Plant & Animal Genome Conference, San Diego, CA
- Defining intergenic transcribed regions as junk DNA or novel genes using a machine learning approach. Poster: Lloyd, Tsai, Sowers, Panchy, and Shiu
- 08/11/16 BEACON Congress, East Lansing, MI
- Evolution of Duplicate Transcription Factors in *Arabidopsis thaliana* Favors Partitioning of Ancestral Expression. Poster: Panchy, Winship, and Shiu
 - Predicting specialized metabolite genes in *Arabidopsis thaliana*. Poster: Moore, Lloyd, and Shiu
 - Does intergenic expression represent functional activity or noisy transcription? Talk: Lloyd, Tsai, Sowers, Panchy, and Shiu.
- 07/10/16 ASPB, Austin, TX
- Untangling the regulatory network of plant response to combined abiotic stress using machine learning. Poster: Azodi, Uygun, Panchy, and Shiu
 - Predicting specialized metabolite genes in *Arabidopsis thaliana*. Poster: Moore, Lloyd, and Shiu
 - Defining functional genic and non-functional regions in a plant genome. Poster: Lloyd, Tsai, Sowers, Panchy, and Shiu.
- 03/24/16 EEBS Symposium, East Lansing, MI
- Predicting specialized metabolic genes in *Arabidopsis thaliana*. Poster: Moore, Wang, Lloyd, Panchy, Shiu
- 03/24/16 Plant Science Graduate Student Research Symposium, East Lansing, MI

- 10/09/15 Evolution of Duplicate Transcription Factors in *Arabidopsis thaliana* Favors Partitioning of Ancestral Expression. Poster: Panchy, Winship, and Shiu
Plant Biotechnology for Health and Sustainability Symposium, East Lansing, MI

 - To what degree can cis-regulatory elements explain how plants respond to combined stress? Poster: Azodi, Liu, Panchy, Seddon, and Shiu
- 06/25/15 ASBMB Symp: Evolution and Core Processes in Gene Regulation, St. Louis, MO.

 - Determinants of nucleosome positioning and their influence on plant gene expression. Talk: Liu
 - Finding cis-regulatory elements that regulate plant defense response to herbivore or wound stress. Poster: Moore
 - Evolution of Transcription Factor Response and Regulation in *Arabidopsis thaliana*. Poster: Panchy
 - Contribution of sequence motif, chromatin state, and DNA structure features to predictive models of transcription factor binding. Poster: Tsai
 - Using *A. thaliana* pathway gene expression data for functional associations to unknown genes. Poster: Uygun
- 05/13/15 Plant Biology Symposium, State College, PA. To what degree can cis-regulatory elements explain how plants respond to combined stress. Talk: Azodi
- 07/26/14 ICAR, Vancouver, Canada. Sequence-specific nucleosome positioning in putative transcription factor binding sites in *Arabidopsis thaliana*. Poster: Liu
- 05/16/14 GLBIO, Cincinnati, OH.

 - Predicting Genes with Lethal Mutant Phenotypes in *Arabidopsis thaliana*. Poster: Lloyd
 - Cis-regulatory code of root and shoot salt response in *Arabidopsis*. Poster: Seddon
 - Function and Evolution of Cyclic Gene Expression in *Chlamydomonas*. Poster: Panchy
- 10/25/13 Annual Symp. on Plant Biotech. for Health and Sustainability, East Lansing, MI. Cis regulatory code of *A. thaliana* stress responsive gene expression. Poster: Uygun
- 10/24/13 Cyber Infrastructure Days, East Lansing, MI.

 - Cis-regulatory code of tissue and cell-type salt response in plants. Poster: Seddon
 - Predicting Genes with Lethal Mutant Phenotypes through a Machine Learning Approach in *A. thaliana*. Poster: Lloyd
 - Cyclical Gene Expression in *Chlamydomonas reinhardtii* Shows Both Conservation and Functional Enrichment with Respect to Phase. Poster: Panchy
- 10/11/13 International Year of Statistics, East Lansing, MI. Cyclical Gene Expression in *Chlamydomonas reinhardtii* Shows Both Conservation and Functional Enrichment with Respect to Phase. Poster: Panchy
- 07/25/13 ASBMB Conf. on evolution and core processes in gene regulation, Chicago, IL. Cis regulatory code of *A. thaliana* stress responsive gene expression. Poster: Uygun
- 07/22/12 ASPB, Austin, Texas, Understanding genome evolution post polyploidization in Brassicaceae. Talk: Moghe
- 06/11/12 Algal Biomass, Biofuels, and Bioproducts, San Diego, CA, Lineage-specific expansion of green algal gene families relevant to lipid metabolism. Poster talk: Wu
- 05/15/12 GLBIO, Ann Arbor, MI.

 - Characteristics and significance of intergenic polyA RNA transcription in *A. thaliana*. Talk: Moghe
 - Evaluating the effects of clustering methods in co-expression-based functional inference in *A. thaliana*. Poster: Uygun

- 07/13/11 Summer Sym. Transcriptional Dynamics, Evol., and Syst. Biol., East Lansing, MI.
- Characteristics and Significance of Intergenic PolyA RNA Transcription in *A. thaliana*. Poster: Moghe
 - Changes in transcript abundance in *Chlamydomonas reinhardtii* following nitrogen deprivation predict diversion of metabolism. Poster: Wu
 - Binding site divergence between a pair of recently duplicated AP2 transcription factors in two *Arabidopsis* species. Poster: Lehti-Shiu
- 06/22/11 ICAR, Madison, WI.
- Strand Specific Transcription in *A. thaliana* Suspension Culture Cells Under High Salinity. Poster: Moghe
 - Binding site divergence between a pair of recently duplicated AP2 transcription factors in two *Arabidopsis* species. Poster: Lehti-Shiu
- 07/31/10 ASPB, Montreal, Canada, Decoding the cis-regulatory logic of stress-regulated genes in *A. thaliana*. Invited talk: Zou
- 07/11/10 ISMB, Boston, MA, Decoding the cis-regulatory logic of stress-regulated genes in *A. thaliana*. Poster: Shiu
- 07/22/09 ASPB, Honolulu, HI.
- Abundant novel small protein and non-coding RNA genes in the *A. thaliana* genome. Invited talk: Lehti-Shiu
 - Thinking in numbers: Infusing quantitative reasoning into biology education. Poster: Shiu
- 06/15/09 SSE, Moscow, Idaho, Genomic changes accompanying rapid floral evolution in the face of a pleiotropic constraint assessed with RNA-Seq. Invited talk: Jeff Conner, collaborator
- 06/06/09 SMCBE, Iowa City, Iowa.
- Regulatory evolution of stress responsive gene duplicates in *A. thaliana*. Poster: Cheng Zou
 - Discovery and characterization of novel ncRNA genes in *A. thaliana*. Poster talk: Moghe
- 07/17/08 Summer Sym. on Transcriptional Regulation and Syst. Biol., East Lansing, MI.
- Identification of novel RNA genes in *A. thaliana*. Poster: Moghe
 - Characterizing stress regulatory evolution of duplicate genes in *A. thaliana* by inferring ancestral expression states. Poster: Zou
- 07/07/07 ASPB, Chicago, IL
- Influence of Gene Functions and Duplication Mechanisms on the Retention of Duplicate Genes during Land Plant Evolution. Poster: Zou
 - Evolution of the Receptor-Like Kinase gene family in land plants Poster: Lehti-Shiu
- 09/29/06 Midwest Quantitative Biology Conference, Mackinaw Island, MI, A large number of novel small open reading frames (sORFs) in the intergenic regions of *A. thaliana* Genome are transcribed or under purifying selection. Poster talk: Hanada
- 06/28/06 ICAR, Madison, WI, High resolution mapping of genome variation between polyploid and diploid *Arabidopsis* species. Poster: Shiu
- 07/16/05 ASPB, Seattle, WA, High Retention Rate and Pronounced Parallel Expansion of Plant Transcription Factor Families. Poster: Shiu
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Teaching & learning

Courses Taught (excluding guest lectures)

Spring, 23	IBIO181h, Introductory Biology for Honors, 3cr, 30 lectures (with AK Cota Ruiz), 69 undergrads.
Spring, 22	CMSE802, Methods in Comp. Modeling, 3cr, 28 lectures, 14 grads
Fall, 21	IBIO341, Fundamentals of Genetics, 3cr, 16 lectures, 180 undergrads.
Spring, 20	Frontier in Computational and Plant Sciences, 3cr, 32 lectures (with A Thompson), 15 grads
Fall, 19	Forum in Computational and Plant Sciences, 1cr, 20 lectures (with T Long), 12 grads
Spring, 19	Forum in Computational and Plant Sciences, 0cr, 20 lectures (with R VanBuren), 16 grads
Fall, 18	PLB801, Foundations of Plant Biology, 3cr, 6 lectures, 7 grads
Fall, 18	PLB400/810, Intro to Bioinformatics, 3cr, 13 grads, 13 undergrads
Fall, 17	PLB801, Foundations of Plant Biology, 3cr, 6 lectures, 11 grads
Fall, 17	ZOL341, Fundamentals of Genetics, 3cr, 20 lectures, 196 undergrads
Fall, 17	GEN 800, Genetics seminar, 1cr, 15 meetings, 10 grads
Fall, 16	PLB400/810, Intro to Bioinformatics, 3cr, 14 grads, 12 undergrads
Fall, 16	PLB801, Foundations of Plant Biology, 3cr, 5 lectures, 7 grads
Fall, 15	ZOL341, Fundamentals of Genetics, 3cr, 20 lectures, 187 undergrads
Fall, 15	PLB801, Foundations of Plant Biol, 3cr, 6 lectures (with R Buell), 17 grads
Fall, 13	ZOL341, Fundamentals of Genetics, 3cr, 20 lectures 190 undergrads
Spring, 13	PLB400/810, Introduction to Bioinformatics, 3cr, 14 grads, 4 undergrads
Spring, 12	PLB803, Integrative Topics in Plant Biology (with D Schemske), 2cr, 20 grads
Fall, 11	PLB802-002, Plant Comp Biol Seminar (with E Farre), 1cr, 8 grads
Spring, 11	PLB400/810, Introduction to Bioinformatics, 3cr, 12 grads and 3 undergrads
Spring, 10	PLB400/810, Introduction to Bioinformatics, 3cr, 14 grads and 4 undergrads
Fall, 09	CMB800, Recent Topics in Biological Networks, Systems Biology and Modeling. (with C Chan, T Brown, R Jin, B Feenym and S Baek). 1cr. 8 grads.
Spring, 09	PLB400/810, Introduction to Bioinformatics, 3cr, 19 grads and 1 undergrads
Spring, 08	PLB803/GEN800, Genome and Evolution (with T. Sang), 3cr, 20 grads
Spring, 07	PLB802, Introduction to Bioinformatics, 3cr, 18 grads and 1 undergrad

Curriculum planning & development, & student professional development

01/19-present	Workshop for enabling researchers to apply machine learning for the American Society of Plant Biologists and MSU
9/14/22	Develop curriculum for interpretable ML for Summer School on Application of Machine Learning in Plant Sciences in the Zurich-Basel Plant Science Center
05/13/22	MSU workshop on FAIR principles: I developed materials and led this workshop for graduate students.
12/1/21	MSU RCR training on Blinding and Randomization: I co-organized and co-led this workshop for graduate students with two other colleagues.
09/18-05/20	Curriculum development for the NSF Research Traineeship Program grant
02/16/17	Workshop: Learning narratives from students of color in STEM classrooms
09/16-5/19	Curriculum development for bioinformatics modular course in CMSE
01/16-06/16	Bioinformatics Training Program Working Committee (also listed in service)
09/15-08/16	Dept. Comp. Math., Sci., & Engr., Curriculum Committee (also listed in service)
01-05/15	Developing curriculum for the Foundation of Plant Biology course (PLB801) with five other colleagues

09-12/13	Developing curriculum for the introductory genetics course (ZOL341) with Richard Allison
07/13-07/15	Organizing and planning the curriculum for the Cold Spring Harbor Frontier and Technique in Plant Science course with two other instructors.
01-05/13	Further development the Theories & Practices in Bioinformatics course to include group-learning and project-based learning.
07-12/12	During sabbatical, I was invited to three universities to meet undergraduate and graduate students to discuss career choices and challenges in being a research scientist.
01-05/12	Developing curriculum for the Integrative Plant Biology seminar (PLB803) with Douglas Schemske
09-12/11	Developing curriculum for the Plant Computational Biology Seminar (PLB802) with Eva Farre
07-09/11	Collaboration with Alan Prather on using smart phones for teaching plant identification and systematics
04/11-5/19	Dept. Plant Biology, Undergraduate Curriculum Committee (also listed in service)
11/4-5/10	University of Wisconsin-Madison Teaching Fellow Symposium as a panelist
10/08	Infusing quantitative concepts in intro biology – project designing activities to introduce quantitative concepts in PLB203
07/06-05/07	Developing a new course: Theories & Practices in Bioinformatics (PLB400/810)

Activities for improving teaching & learning

11/15/22	Spelman College: introduction to data science
10/8/21	NSF Data Science Education Townhall – speaker for Session 1: Data science research across disciplines and fields: Similarities, differences, and pathways
07/18/21	Plant Biology 2020 workshop: “Enhancing Plant Science Education through the NSF National Research Traineeships (NRT)” Workshop – lead the workshop with four colleagues.
01-09/20	Discussion group on enhancing collaboration between experimental plant biologists and quantitative scientist that result in a review article with Dale R as first author.
12/1-3/20	NIMBIOS: Quantitative Biology Graduate Education Workshop
02/16/17	Learning narratives from students of color in STEM classrooms workshop
09/11	Lilly Teaching Seminar on “Quantitative Literacy and the 21st Century Curriculum”
09/10	Lilly Teaching Seminar on "Concept maps, mind maps, and concept circle diagrams"
01-03/09	Lilly Teaching Seminar series (2 sessions)
09/08-06/09	Lilly Teaching Fellow – participated in monthly meeting discussing literatures on teaching and learning
03/08	College Science Teaching and Learning seminar, 3hr workshop
05/07	College Science Teaching and Learning seminar, 3hr workshop
12/06-present	Subscription to "Tomorrow's Professor" with monthly article relevant to college education

Mentoring

High School Students

Therese Hourani	9/23 – present, Lansing Catholic High School, Lansing, MI
Siara Goodnoe	1/22 – present, Okemos High School, Okemos, MI
Jeffery Fishman	06-08/17. Upper Dublin High School, Maple Glen, PA (HSHSP)
Rachel Grobeman	06-08/15. Center for Enriched Studies, Los Angeles, CA (HSHSP)
Hannah Jasicki	06-08/13. La Porte High School, La Porte, IN. (HSHSP)

Manali Naik	06-08/10. Monta Vista High school, Cupertino, CA. (HSHSP)
Andy Lin	06/08-08/09. Okemos High School, Okemos, MI. (HSHSP)
Meiyi Cheng	06-08/08. Punahou High School, Punahou, HI (HSHSP)
Emma Conner	06/08. Kalamazoo Area Mathematics & Science Center
Madalyn Parker	06/08. Kalamazoo Area Mathematics & Science Center
Tanmay Prakash	06-08/06. Novi High School, Novi, MI (HSHSP)

* HSHSP: High School Honors Science/Mathematics/Engineering Program in MSU

Undergraduate Students

Skylar Fusco	9/23 – present, Human Biology, MSU
Christina King	10/22 – present, Plant Biology, MSU
Marjorie R. Milton	9/22 – present, Plant Biology, MSU
Krishen Patel	4/22 – 4/23, Plant Biology, MSU
Elijah Persson-Gordon	10/21 – 7/23, Plant Biology, MSU
Patricia Blum	1 - 4/20, Heinrich-Heine-University, Germany
Traverse Cottrell	11/19 – 2/20, Plant Biology, MSU
Abigail Seeger	11/19 – 9/21, Plant Biology, MSU
Ketan Jog	6-8/19, Columbia University, NSF REU
Emily Bolger	6-08/19, Moravian College, NSF REU
Lizzie Gibbons	9/18 – 5/19, Plant Biology, MSU
Sarah Horan	1/18 – 6/20, Kinesiology, MSU
Aaron Lee	5/18 – 8/18, College of New Jersey, NSF REU
Michael Douglas	5/17 – 8/17, Adrian College, NSF REU
Paityn Donaldson	5/17 – 8/19, Molecular Genetics & Genomics, MSU
Dante D. Poe	10/16 – 5/19, Biochem. & Mol. Biol., MSU
Melissa Baxter	9/16 – 12/17, Plant Biology, MSU
Rosalie P. Sowers	6 – 8/16, Pennsylvania State University, NSF REU
Eamon Winship	5/15 – 7/16, Biochem. & Mol. Biol., MSU
Nicholas Reuter	1/15 – 6/15, Com. Sci. & Engr., MSU
Sebastian Stankiewicz	9/13 – 6/16, Packaging, MSU
Mark Gomulinski	9/13 – 12/15, Psychology, MSU
Matt Simenc	8 – 8/13, Humboldt State University, NSF REU
Jennifer Liu	9/12 – 6/13, pre-med, MSU
Mike Veling	6 – 8/11, University of Massachusetts-Amherst, NSF REU
David Hufnagel	6/11 – 8/13, Lyman-Briggs, Molecular Genetics, MSU
Benjamin M. Wolf	9/10 – 6/12, Plant Biology, MSU
Stephanie Plotas	9/09 – 6/13, Education, MSU
Alex Seddon	5/09 – 8/12, Biological Science, MSU
Josh Mackaluso	10/08 – 6/10, Biochem. & Mol. Biol., MSU
Jordan R. Boniface	9/08 – 5/09, Animal Science/Pre-Vet, MSU
Elizabeth A. Wright	6 – 8/09, 10, Jackson State University, NSF REU
Kai Ruan	6 – 8/09, University of Michigan, NSF REU
Ted Cybulski	06 – 08/08, Massachusetts Inst. Technol., NSF REU
Juyeon Park	06 – 08/07, Williams College, NSF REU
Amanda Tabbert	7/07 – 6/08, Biological Sciences, MSU
Jessica A. Oswald	1/07 – 6/08, Zoology, MSU
Emily Eckenrode	1/06 – 5/07, Human Biology, MSU

Advising, Graduate Student (Thesis)

Thejesh Mallidi	10/23 – present, M.S. of Data Science
Edmond Anderson	9/23 – present, M.S. of Data Science

Jingyao Tang	9/23 – present, doctoral Comp. Math. Sci. & Engr.
Huan Chen	9/21 – 3/24, doctoral, Genetics & Genome Sci. (joint with Bradley Day)
Brianna N. I. Brown	9/21 – present, doctoral, Plant Biology
Kenia E. Segura Abá	1/21 – present, doctoral, Genetics & Genome Sci.
Thilanka Ranaweera	8/19 – present, doctoral, Plant Biology
Siobhan A. Cusack	5/17 – 10/20, doctoral, Cell & Mol Biol
Christina B. Azodi	8/14 – 9/19, doctoral, Plant Biology; Data Scientist, Bayer
Alexander E. Seddon	8/13 – 5/15, MS, Plant Biology; Course coordinator, Michigan State University
Bethany M. Moore	8/13 – 10/19, doctoral, Plant Biology; Postdoctoral Associate, University of Wisconsin-Madison
Johnny P. Lloyd	8/12 – 10/17, PhD, Plant Biology; Data Scientist, Bayer
Nicholas L. Panchy	5/12 – 11/17, PhD, Genetics; Institute of Cyber-Enabled Research Consultant, Michigan State University
Sahra Uygun	5/11 – 3/17, PhD, Genetics; Bioinformatician, Agendia Inc.
Guangxi Wu	5/09 – 9/13, PhD, Cell & Mol Biol; Research Scientist, Zymo Research
Shan Yin	9/08 – 6/10, MS, Plant Biology
Gaurav Moghe	5/07 – 10/13, PhD, Genetics; Assistant Professor, Cornell University

Advising, Post-Doctoral Scholars

Paulo Izquierdo Romero	3/23 – present, Michigan State University
Rajneesh Singhal	1/23 – present, Michigan State University
Peipei Wang	3/16 – 6/22, Professor/Researcher, Kunpeng Institute of Modern Agriculture, Fosan, China
Z. Tsung-Yeh Tsai	3/15 – 11/16, Bioinformatics Scientist, Illumina Inc.
Ming-Jung Liu	2/13 – 1/16, Assistant Research Fellow, Academia Sinica, Taiwan
Kelian Sun	10/09 – 12/11, Postdoctoral Associate, MSU
Cheng Zou	8/06 – 6/11, Research Associate, Inst. Of Biotech. Cornell Univ.
Kousuke Hanada	5/06 – 5/07, Associate Professor, Kyushu Inst. of Tech., Japan

Student awards/honors

Brianna Brown	4/21, Michigan State University Enrichment Fellowship
Christina Azodi	1/19, ASPB Travel Award
Bethany Moore	5/18, Fields Award - Outstanding Teaching by a Graduate Student, Plant Biology, MSU
Christina Azodi	5/18, NSF Graduate Research Opportunities Worldwide Fellowship
Christina Azodi	5/18, Flash Talk Competition Winner, Great Lakes Bioenergy Research Center
Christina Azodi	3/18, Poster Competition 2nd place, Fate of the Earth Conference
Nicholas Panchy	5/17, Outstanding Graduate Student Award, Genetics, MSU
John Lloyd	4/17, Bessey Award for Outstanding Graduate Research, Plant Biology, MSU
Christina Azodi	1/16, ASPB Travel Award
Christina Azodi	6/15, NSF Graduate Research Fellowship
Zing Tsung-Yeh Tsai	6/15, ASBMB symposium 3 rd Prize Poster Award
Christina Azodi	5/15, Penn. State Plant Biology Symposium Travel fellowship
Sahra Uygun	4/15, Dissertation Continuation Fellowship
Johnny Lloyd	3/15, Dissertation Continuation Fellowship, College of Natural Sciences, MSU
Johnny Lloyd	10/13, Best Poster award, Cyber-Infrastructure Days, MSU
Nicholas Panchy	10/13, Best Poster award, International Year of Statistics, MSU
Gaurav Moghe	5/13, Outstanding Graduate Student Award, Genetics, MSU
Johnny Lloyd	7/12, Mericle Fellowship, Plant Biology, MSU
Guangxi Wu	5/12, Dissertation Continuation Fellowship, College of Natural Sciences, MSU

Gaurav Moghe	5/12, Dissertation Completion Fellowship, College of Natural Sciences, MSU
Alex Seddon	5/12, NSF Robert Noyce Teacher Scholarship
Nick Panchy	9/11, University Distinguished Fellowship, MSU
Manali Naik	1/11, Intel Science Talent Search, semi-finalist
	10/10, Siemens Competition, semi-finalist
Stephanie Plotas	3/10, The Patricia E. and Jerry C. Wagner Endowed Scholarship in Elementary Education
Cheng Zou	4/09, Outstanding Research Award, Gene Expression in Development & Disease Program, MSU
Emma Conner & Madalyn Parker	3/09, 1 st place in team competition, Southwest Michigan Science and Engineering Fair
Amanda Tabbert	5/08, Dortha E. and John D. Withrow Endowed Scholarship
Gaurav Moghe	9/07, Graduate Fellowship, the Gene Expression in Development & Disease Program, MSU

Graduate Student Committee

* BMB: Biochemistry & Molecular Biology; CMSE: Computational Mathematics, Science, & Engineering; GGS: Genetics & Genomic Science; PSM: Plant, Soil, & Microbial Sciences; HHU: Heinrich Heine University, Düsseldorf, Germany

** : Become jointly advised

Name	Department/Program*	Degree	Student since	On since	Defended
Dibin Baby	Genetics-HHU*	PhD	20	2/23	
Francesco Cosenza	Genetics-HHU*	PhD	20	10/22	
Isaia Vardanega	Genetics-HHU*	PhD	19	4/22	
Brandon Webster	Plant, Soil, Microbial Sci	PhD	21	3/22	
John Salako	Geological Sciences	PhD	21	1/22	
MD Alamin	Comp. Sci. & Engr.	PhD	20	12/21	
Jordan Manchego	Plant, Soil, Microbial Sci	PhD	21	11/21	
Miles David Roberts	Genetics & Genomic Sci	PhD	20	07/21	
Zhongjie Ji	Plant, Soil, Microbial Sci	PhD	18	12/20	10/24
Brijen Babulal Miyani	Environ. Engr.	PhD	20	11/20	
Huan Chen**	Genetics & Genomic Sci	PhD	19	09/20	11/23
Scott Teresi	Horticulture	PhD	19	02/20	
Eric Mckim	CMSE/GGS	PhD	18	02/20	
Nancy Sharma	Plant, Soil, Microbial Sci	PhD	19	11/19	
Julian Venegas	CMSE	PhD	18	07/19	
Garret P. Miller	Biochem & Mol Biol	PhD	17	12/18	6/22
Maria Paola Puggioni	Genetics-HHU*	PhD	15	06/18	06/19
Bethany J. Gettings	Plant Biology	PhD	17	02/18	
Jeremy Pardo	Plant Biology	PhD	17	01/18	10/22
Camille McCall	Civil & Environ. Engr.	PhD	16	05/17	06/20
Pai Li	Plant Biology	PhD	16	04/17	10/21
Emily Jennings	Plant Biology	PhD	16	04/17	08/22
Birte Schwarz	Genetics-HHU*	PhD	15	05/16	06/19
Amy Baetsen-Young	Plant, Soil, Microbial Sci	PhD	15	01/16	06/19
Lavida Brook	Biochem & Mol Biol	PhD	14	01/15	05/19
Teresa Clark	Plant Biology	PhD	13	12/14	11/18
Colleen Friel	Plant Biology	PhD	13	12/14	08/18
Daniel Hartleb	Genetics-HHU*	PhD	11	09/14	06/18

Gina Pham	Plant Biology	PhD	13	03/14	12/18
Sarah Richards	Genetics-HHU*	PhD	11	01/14	06/18
Sam Perez	Plant Biology	MSc	12	01/14	04/18
Cory B. Kohn	Zoology	PhD	11	03/13	08/18
Hussein Hijazi	Comp. Sci. & Eng.	PhD	11	03/13	12/17
Janina Maß	Genetics-HHU*	PhD	11	01/13	07/15
Alisandra Denton	Genetics-HHU*	PhD	11	01/13	12/14
Eric Poliner	Biochem & Mol Biol	PhD	12	01/13	11/17
Amanda Charbonneau	Genetics	PhD	12	01/13	05/18
Safa Abdelghaffar Alzohairy	Plant, Soil, Microbial Sci	PhD	12	04/12	08/18
Cheng Yuan	Comp. Sci. & Eng.	PhD	08	11/11	12/14
Anne Sonnenschein	Genetics	PhD	10	06/11	05/17
Emily Dittmar	Plant Biology	PhD	10	03/11	06/17
Matthew Bennett	Plant Biology	MSc	11	02/11	04/13
Prapaporn Techa-angkoon	Comp. Sci. & Eng.	PhD	10	01/11	01/17
Kok Kurtulus	Genetics	PhD	10	11/10	05/15
Wenyan Du	Plant Biology	MSc	09	07/10	10/12
Erin Slabaugh	Biochem & Mol Biol	PhD	07	06/10	12/11
Krystle Wiegert	Plant Biology	MSc	09	04/10	12/11
Yuanjie Su	Crop & Soil Sci.	PhD	09	03/10	12/13
Qingpeng Zhang	Comp. Sci. & Eng.	PhD	08	02/10	05/15
Yani Chen	Plant Biology	PhD	09	01/10	10/13
Ben Koestler	Microbiol & Mol Genet	PhD	08	01/10	03/14
Dongyan Zhao	Horticulture	PhD	08	03/09	04/14
Shannon Marie Bell	Biochem & Mol Biol	PhD	07	01/09	06/12
Matt Oney	Plant Biol	MSc	07	06/08	12/17
Shaoyu Li	Stat & Prob	PhD	06	04/08	07/11
Ertugrul Dalkic	Genetics	PhD	06	01/08	08/12
Ann Armenia	Horticulture	PhD	06	11/06	12/13
Hondarangallage D K Moonesinghe	Comp Sci & Eng	PhD	03	10/06	10/07
Marcela Alejandra Carvallo-Pinto	Biochem & Mol Biol	PhD	02	09/06	12/09
Michael Arthur Grillo	Plant Biology	PhD	05	08/06	04/13
Brad Lee Cavinder	Genetics	PhD	05	05/06	12/11
Ailing Zhou	Plant Biology	MSc	05	04/06	10/07

Visiting Scholar

Liang Xu	12/17-8/19, Associate Professor of Agronomy, Nanjing Agricultural Univ, China
Fanrui Meng	06/17-10/22. Research associate, Chinese Academy of Sciences, China
Liwang Liu	12/16-05/17. Professor of Agronomy, Nanjing Agricultural University, China
Wen-Yu Liu	08/16-07/17. Postdoctoral scientist, Biodiversity Center, Academia Sinica, Taiwan
Kun-Ting Hsieh	06/16-05/17. Graduate student, Inst. Mol. Biol., Natl. Chung-Hsing Univ., Taiwan
Ming-Tsung Wu	04/13. Graduate student, Inst. of Plant & Microbial Biol, Academia Sinica, Taiwan
Michael Ruckle	09/11. Postdoctoral scientist, Inst. of Agri. Sci., ETH-Zurich, Switzerland
Yi Lee	08/10-08/11. Professor, Dept. of Biosys. Eng., Chungbuk Natl. Univ., South Korea
Zhihua Hua	08/08. Postdoctoral scientist, Dept. of Genetics, University of Wisconsin-Madison

Sugaleshini Subramanian	11/06-05/07. Visiting scholar. Bioinformatics Research Institute, Ashok Nagar, India
Chung-Shien Wu	06/06. Graduate student, Dept. of Forestry, National Taiwan University, Taiwan

Faculty Mentoring Committee

Name	Department	On since	Tenured
Ting-Ying Wu	Inst. Plant & Microbial Biol., Academia Sinica, Taiwan	1/23	
Longxiu Huang	Comp. Math. Sci. & Engr.	9/22	
Rachel Naegele	Plant, Soil, Microbial Sci	3/22	
Addie Thompson	Plant, Soil, Microbial Sci	9/21	
Emily Joseph	Plant Biology	3/18	
Arjun Krishnan	Comp. Math. Sci. & Engr.	1/18	Left for another institution 2022
Yuying Xie	Comp. Math. Sci. & Engr.	1/18	6/22
Daniel Chitwood	Horticulture/Comp. Math. Sci. & Engr.	1/18	
Robert VanBuren	Horticulture	1/18	6/23
Chad Niederhuth	Plant Biology	1/17	Left for industry 2023

Service & outreach

University/College Committees

08/23-9/23	AI Summit Planning, Associate Vice President for Research and Innovation
07/19-09/19	College of Natural Science Strategic Planning Committee on Research
08/18-11/18	ICER Director review committee
01/17-02/17	University Scholarship selection committee
01/16-06/16	Bioinformatics Training Program Working Committee (also listed in teaching)
04/15-06/15	Office of the President, Inquiry Panel
11/13-05/14	Center for Genomics-Enabled Plant Science Search Committee
10/13-08/14	Dept. Comp. Math., Sci., & Engr. Planning Committee
11/09-12/10	Inst for Cyber-Enabled Res., User Committee
04/08-10/08	Cyber-Enabled Research Visioning Committee

Other Services within the University

9/23 - present	Advisory Committee, NSF NRT AIDMM Program	Advising and evaluate the graduate training program.
9/21-22	Temporary mentor for incoming graduate student	Help mentoring incoming students before they choose a lab for the Bio-Molecular Science Program.
8/18 - present	NSF Research Traineeship Program - IMPACTS	I serve as the director for this five-year program that are expected to fund 39 graduate trainees. I am responsible for establishing the program, managing program activities, interacting with trainees, and delegating responsibilities among trainers.
3/24/15	Plant Science Graduate Student Symposium	I served as a judge for student presentation.

3/17/15	Plant Biology Club	I held a discussion with undergraduate students interested in plant science on topics including hypothesis testing, publication bias, genome evolution, and biological noise.
4/13	Initiative for Data-Intensive Biology	Together with 19 other faculty, we prepared a white paper for the named initiative in campus.
2-05/09	QBI Bioinformatics curriculum development	I am involved in a QBI initiated effort to identify availability of and needs for bioinformatics education resources and curriculum among MSU researchers.
9-12/08	MSU Bioinformatics symposium	I was responsible for organizing a University-wide bioinformatics symposium sponsored by the Quantitative Biology Initiative in MSU. The symposium was held in Dec. 13, 2008, and 32 faculty members from 11 departments in four colleges (CNS, CNR, CE, CHM) attended.

Departmental Committees

*CMSE: Computational Mathematics, Science, & Engineering

9/23-current	CMSE, Graduate Curriculum Committee
9/23-current	CMSE, Advisory Committee (chair)
9/23-current	Plant Biology, Award Committee
9/22-6/23	CMSE, Annual Review Committee (co-chair)
5/22-3/23	Plant Biology, 1855 Professor Faculty Search Committee (chair)
6/21-9/22	CMSE, Mathematical Data Science Faculty Search Committee (chair)
6/21-6/22	Plant Biology, Chair Search Committee
6/19-5/20	CMSE, Graduate Program Committee
4/19-10/19	CMSE, Long Range Planning Committee
1/19-12/19	CMSE, Chair Search Committee
9/18-5/20	Plant Biology, Reappointment, Promotion, & Tenure Committee
9/18-8/19	CMSE, Reappointment, Promotion, & Tenure Committee
9/18-8/19	CMSE, Advisory Committee
9/15-5/16	Plant Biology, Computational Genomics Faculty Search Committee
5/14-3/15	Plant Biology, Chair Search Committee
2/13-5/14	Plant Biology, Long Range Planning Committee
9/11-8/18	Plant Biology, Space Committee
6/11-3/12	Plant Biology, Plant Genomic/Molecular Biology Faculty Search Committee
4/11-5/20	Plant Biology, Undergraduate Curriculum Committee (also listed in teaching)
9/10-7/12	Plant Biology, Departmental Advisory Committee
9/09-6/10	Plant Biology, Plant Computational Biology focus group
9/07-6/09	Plant Biology, Graduate Committee
3/06-3/07	Plant Biology, Systems Biology Faculty Search Committee
1/06-3/12	Plant Biology, Web Committee

Committees for other academic programs

4/6-10/24	Univ. of Tennessee, Life Science Academic Program Review Committee
9/23-present	Oakland University NRT Program, External Advisory Committee
9/23-present	NSF NRT AIDMM Program, Advisory Committee
10/23	Tenure package review for Academia Sinica, Taiwan
8/23	Tenure package review for Purdue University
1/17-12/18	Genetics Graduate Program, Associate Director
9/16-4/17	Plant Resilience Institute Faculty Search Committee (Global Impact Initiative)
7/16-5/17	CMSE, Bioinformatics Coordinator Search Committee

9/15-5/17	Plant Computational Genomics Faculty Search Committee (Global Impact Initiative)
9/15-8/18	CMSE, Curriculum Committee (also listed in teaching)
9/15-5/16	CMSE, Data Science Faculty Search Committee
10/14-3/15	CMSE, Stat. & Prob. Faculty Search Committee
9/14-8/15	CMSE, Faculty hiring umbrella committee
5/13-5/15	Genetics Graduate Program, Executive Committee
9/11-5/12	Biomolecular Science Admission Committee
6/10-7/11	Gene Expression of Disease & Development Program, 2011 meeting committee
7/09-5/10	Dept Biochemistry & Molecular Biology, Plant Science Excellence Search Committee
1/08-10/09	Quantitative Biology & Modeling Initiative, Public Relations Committee
6/08-5/09	Gene Expression of Disease & Development Program, Hannah Chair Search

Other major outreach activities

9/16/23	Carol J. Greer Community Learning Center	Graduate students Edmond Anderson, Kenia Segura Aba, Dr. Melissa Lehti-Shiu and I organized two activities for 9 low-income youths to understand the process of science.
5/11/23	Michigan Youth Institute	I serve as a panel member to review student assays and discuss merits of proposed solutions for the World Food Prize competition.
5/21/22	Girl's Math and Science Day	Graduate students Ally Schumacher and Kenia Segura Aba led an activity "Code Like a Girl" to engage middle and elementary school girls.
4/27/22	Clinton High School	I implemented and led a DNA Day activity with high school students on relationships between DNA and trait.
7/18/19	DeWitt Public Library	Graduate student Christina Azodi and I organized a session in the <i>Girls who Code at the Library</i> activity for grade schoolgirls with 7 attendees.
4/21/17	MSU Science Festival	Graduate student Beth Moore organized the event at the Woldumar Nature Center, Lansing and presented where Beth, Melissa Lehti-Shiu and I presented two booths focusing on night-time biological activities.
3/4/17	Girl's Math and Science Day	Graduate student Christina Azodi and Nick Panchy implemented and led an activity "Code Like a Girl" to engage middle and elementary school girls in programming concepts without using computers.
3/22/14	MSU Frontier in Science Program	I served as an instructor for a five-hour session introducing current development in evolutionary biology and big data in biology to 6 secondary school educators.
12/10/11	MSU Frontier in Science Program	I served as an instructor for a five-hour session introducing current development in genomic biology to 15 secondary school educators.
05/11/11	East Lansing MacDonald Middle School	I served as an event judge for student science projects.
05/01/10	Michigan Science Olympiad and Holt High School	I served as a judge for the "Picture-It" event. In addition, I worked with Ms. Amanda Tabbert from Holt High School, Holt, MI to explore the possibility of getting laboratories to donate used equipment and/or reagents to budget strapped local high schools.
05/03/09	Michigan Science Olympiad	I served as a judge for the "Picture-It" event.

03/17/07	East Lansing Public High School	With NSF funding (for radish comparative genome sequencing), I held two workshops targeting high school students that were held at East Lansing Public High School with the help of Ms. Heather Mueller, a biology teacher.
2006-07	East Lansing Public Library	I designed and carried out outreach activities that explored the impact of human and other genome sequencing programs on science, technology, and society. It was held at the East Lansing Public Library (ELPL) with the assistance of Ms. Julie Pierce, a librarian.
