CURRICULUM VITAE

Shin-Han Shiu
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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 *Arabidopsis thaliana*
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, Google X
09/18-present	Director, NSF Research Traineeship Program: IMPACTS - Integrated Training Model in Plant and Computational Sciences, Michigan State University (MSU)
08/18-present	Professor, Department of Computational Math, Sci, & Engr., MSU
07/17-present	Professor, Department of Plant Biology, MSU
01/17-12/18	Associate Director, Genetics Graduate Program, MSU
07-12/12	[Sabbatical] Visiting Associate Fellow, Biodiversity Center, Academia Sinica, Taiwan
07/11-06/17	Associate Professor, Department of Plant Biology, MSU
01/06-06/11	Assistant Professor, Department of Plant Biology, MSU
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

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, MSU
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, National Taiwan University, Taiwan

Summary of professional activity

Publications	Career publication: 106, citations: 17,622, h-index: 60, i10-index: 89 (Google Scholar).

Extramural grants	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	Five national and international program committee members since 2011. Recent: Plant Biology 2018-2023.
Editorial board	Editor/advisor for five journals since 2006. Current: New Phytologist, PLoS ONE.
Association memberships	Five international and national societies including AAAS (since 2014), ASPB (1998), ISCB (since 2003), SMBE (since 2002)
Journal and grant reviews	Reviewer for 10 general biology/science, 4 computational biology, 6 evolutionary biology, 9 genetics/genomics, 17 plant science, and 3 other journals. Reviewer/panelist for proposals from 3 US/State, 4 EU, and 12 other national agencies, research fund, and/or universities.
Current/recent example service to the broader community	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

Details in Appendix

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 challenge biases and discrimination. I am also committed to promoting equal opportunities and 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 better understand molecular mechanisms through integration of multi-scale biological data using computational, data science, and AI-based approaches.
- Extract knowledge and infer cause-effect relationships from literature data computationally using natural language processing approaches.

Details in Appendix.

Ten representative publications

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

1. **Wang P, Meng F, Donaldson P, Horan S, *Panchy NL*, *Vischulis E*, Winship E**, Conner JK, **Lehti-Shiu MD, Shiu SH** (2022) High-throughput measurement of plant fitness traits with an object detection method using Faster R-CNN. *New Phytologist* 234:1521.
2. ***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.
3. ***Azodi CB***, Tang J, **Shiu SH**. (2020) Opening the black box: interpretable machine learning for geneticists. *Trends in Genetics* 36(6):442.
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.
5. **Tsai ZTY, *Lloyd J*, Shiu SH** (2017) Defining functional, genic regions in the human genome through integration of biochemical, evolutionary, and genetic evidence. *Mol. Biol. Evol.* 34(7):1788-1798
6. ***Panchy N*, Lehti-Shiu M, Shiu SH.** (2016) Evolution of Gene Duplication in Plants. *Plant Physiology*. 171(4):2294-316.
7. **Liu MJ, *Seddon AE*, Tsai ZTY**, Major IT, Floer M, Howe GA, **Shiu SH** (2015) Determinants of nucleosome positioning and their influence on plant gene expression. *Genome Res.* 25(8):1182-95.
8. **Zou C, Sun K, Mackaluso JD, Seddon AE**, Jin R, Thomashow MF, **Shiu SH** (2011) Cis-regulatory code of stress responsive transcription in *Arabidopsis thaliana*. *Proc Natl Acad Sci USA* 108(36):14992-7.
9. 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.
10. **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.

Seminars/Symposium Talks & conference participation

Talks	91 since 2001, in 51 departments/institutions and 17 international/national conferences or symposium in 13 countries
Posters	50 posters since 2005 where 48 are with students and/or postdoctoral scientists as presenters that includes 19 as conference talks.

Details in Appendix

Teaching, learning, & mentoring

Summary of Teaching Philosophy

My career goal in education is to foster the abilities of the students at all levels for independent, critical thinking using biological concepts as examples. To attain this goal, my approach is to create a learning environment where the learners actively participate in dialogs, exchange opinions in groups, learn by doing, and solve authentic problems that we face as scientists. In this environment, the learners practice identifying the core questions and hypotheses, assessing the best approaches to solutions, designing experiments, analyzing the outcomes quantitatively, and making interpretations. This approach is what I use to build my core research group, to run the course I have taught since 2007, and to attempt transforming the introductory genetics and biology class with large enrollments.

Instructional and mentoring activities

Courses Taught (excluding guest lectures)	10 courses (2 undergrad and 8 grad-levels), 1046 students (761 undergrads, 255 grads)
High school student advisees	9 thus far, 3 received awards/honors.
Undergraduate student advisees	35 thus far, including 15 female, 2 LGBTQ+, and 3 under-represented minority students, 3 received award/honors.
Graduate student advisees (thesis)	14 thus far, including 8 female, and 2 under-represented minority students; received 21 awards/honors.
Postdoctoral scholars	6 thus far, 5 in academic institutions (3 as faculty, 2 as research associates) and 1 in the industry.
Faculty mentees	10 thus far
Curriculum development	NSF Research Traineeship Program grant, Workshop: Learning narratives from students of color in STEM classrooms, Cold Spring Harbor course, development of >10 courses and workshops.
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.

Details in Appendix

Service & outreach

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.

Details in Appendix

APPENDIX

Professional activities

Scientific conference organization

9/18-present	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

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

	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
Panelist	9/6-8/2021, Innovative Translation Agricultural Research Program, Academia Sinica, Taiwan 3/25-26/2019, NSF Directorate of Graduate Education 11/29-30/2017, Innovative Translation Agricultural Research Program, Academia Sinica, Taiwan 11/21-22/2013, Innovative Translation Agricultural Research Program, Academia Sinica, Taiwan

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 plan 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 MSU. 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 DBI-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 @ MSU 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 MSU 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 MSU 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. 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
2. ***Ranaweera T, Brown BNI*, Wang P, Shiu SH** (2022) Temporal Regulation of Cold Transcriptional Response in Switchgrass. *Frontier in Plant Sci* 13:998400
3. 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
4. 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
5. **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
6. **Wang P, *Schumacher AM***, Shiu SH (2022) Computational prediction of plant metabolic pathway. *Curr Opin Plant Biol* 66:102171
7. ***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
8. 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.
9. 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.
10. ***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.
11. **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
12. **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
13. Baetsen-Young A, Chen H, **Shiu SH**, Day B. (2021) Contrasting transcriptional responses to Fusarium virguliforme infection in symptomatic and asymptomatic hosts. *Plant Cell Plant Cell* 33(2):224-247
14. Liu WY, Lin HH, Yu CP, Chang CK, Chen HJ, Lin JY, Lu MYJ, Tu SL, **Shiu SH**, Wu SH, Ku MSB, Li WH (2020) Maize ANT1 modulates vascular development, chloroplast development, photosynthesis and plant growth. *Proc. Natl. Acad. Sci., USA* 117(35):21747.
15. **Azodi CB, Lloyd JP, Shiu SH**. (2020) The cis-regulatory codes of response to combined heat and drought stress in Arabidopsis thaliana. *Nucleic Acid Res-Genomics & Bioinformatics* 2(3):lqaa049.
16. **Moore BM**, **Wang P**, Fan P, **Lee A**, Leong B, Lou YR, Schenck C, Sugimoto K, Last R, **Lehti-Shiu MD**, Barry CS, **Shiu SH** (2020) Within and cross species predictions of plant specialized metabolism genes using transfer learning. *In Silico Plants* 2(1):diaa005.
17. Fan P, **Wang P**, Lou YR, Leong BJ, **Moore BM**, Schenck CA, Combs R, Cao P, Brandizzi F, **Shiu SH**, Last RL. Evolution of a plant gene cluster in Solanaceae and emergence of metabolic diversity. *eLife* 9:e56717.
18. ***Azodi CB***, Tang J, **Shiu SH**. (2020) Opening the black box: interpretable machine learning for geneticists. *Trends in Genetics* 36(6):442.
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Research talks and posters

Seminars/Symposium Talks

11/13/23	Agro-Biotechnology Research Center, Taiwan
7/11/23	Institute of Plant & Microbial Science, Academia Sinica, Taiwan
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, MSU, *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 *Arabidopsis* Research, University of Wisconsin, *Madison, WI*
01/26/05	Dept. of Plant Biology, MSU, *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 *Arabidopsis* 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 *Arabidopsis* Research, University of Wisconsin, *Madison, WI*

Poster and oral presentation in meetings by lab personnel

05/17/22	GLBRC Annual Science Meeting • Genomic prediction of yeast fitness in different environments. Poster: Segura Abá, Ding, Shiu • Temporal regulation of cold transcriptional response in switchgrass. Poster: Ranaweera, 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 • Transcriptome-based prediction of complex traits in maize. Poster: Azodi, Bolger, McCarren, Roantree, de Los Campos, Shiu • Impact of sequencing strategies, variant types, and ploidy levels on genomic prediction in switchgrass. Talk: Wang, Meng, Azodi, Shiu
08/08/18	BEACON Congress, East Lansing, MI • Modeling degrees of genetic redundancy among paralogs in Arabidopsis thaliana. Talk: Cusack, 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 EEBB 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

- Evolution of Duplicate Transcription Factors in Arabidopsis thaliana Favors Partitioning of Ancestral Expression. Poster: Panchy, Winship, and Shiu

10/09/15 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	SMBE, 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

*: 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

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

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

Christina King	10/22 – present, Plant Biology, MSU

Marjorie R. Milton	9/22 – present, Plant Biology, MSU
Krishen Patel	4/22 – present, Plant Biology, MSU
Elijah Persson-Gordon	10/21 – present, Plant Biology, MSU
Patricia Blum	01 - 04/20, Heinrich-Heine-University, Germany
Traverse Cottrell	11/19 –2/20, Plant Biology, MSU
Abigail Seeger	11/19 – 9/21, Plant Biology, MSU
Ketan Jog	06-08/19, Columbia University, NSF REU
Emily Bolger	06-08/19, Moravian College, NSF REU
Lizzie Gibbons	09/18 – 05/19, Plant Biology, MSU
Sarah Horan	01/18 – 06/20, Kinesiology, MSU
Aaron Lee	05/18 – 08/18, College of New Jersey, NSF REU
Michael Douglas	05/17 – 08/17, Adrian College, NSF REU
Paityn Donaldson	05/17 – 08/19, Molecular Genetics & Genomics, MSU
Dante D. Poe	10/16 – 05/19, Biochem. & Mol. Biol., MSU
Melissa Baxter	09/16 – 12/17, Plant Biology, MSU
Rosalie P. Sowers	06 – 08/16, Pennsylvania State University, NSF REU
Eamon Winship	05/15 – 07/16, Biochem. & Mol. Biol., MSU
Nicholas Reuter	01/15 – 06/15, Com. Sci. & Engr., MSU
Sebastian Stankiewicz	09/13 – 06/16, Packaging, MSU
Mark Gomulinski	09/13 – 12/15, Psychology, MSU
Matt Simenc	08 – 08/13, Humboldt State University, NSF REU
Jennifer Liu	09/12 – 06/13, pre-med, MSU
Mike Veling	06 – 08/11, University of Massachusetts-Amherst, NSF REU
David Hufnagel	06/11 – 08/13, Lyman-Briggs, Molecular Genetics, MSU
Benjamin M. Wolf	09/10 – 06/12, Plant Biology, MSU
Stephanie Plotas	09/09 – 06/13, Education, MSU
Alex Seddon	05/09 – 08/12, Biological Science, MSU
Josh Mackaluso	10/08 – 06/10, Biochem. & Mol. Biol., MSU
Jordan R. Boniface	09/08 – 05/09, Animal Science/Pre-Vet, MSU
Elizabeth A. Wright	06 – 08/09, 10, Jackson State University, NSF REU
Kai Ruan	06 – 08/09, 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	07/07 – 06/08, Biological Sciences, MSU
Jessica A. Oswald	01/07 – 06/08, Zoology, MSU
Emily Eckenrode	01/06 – 05/07, Human Biology, MSU

Advising, Graduate Student (Thesis)

Jingyao Tang	09/23 – present, doctoral Comp. Math. Sci. & Engr.
Huan Chen	09/21 – present, doctoral, Genetics & Genome Sci. (joint with Bradley Day)
Brianna N. I. Brown	09/21 – present, doctoral, Plant Biology
Kenia E. Segura Abá	01/21 – present, doctoral, Genetics & Genome Sci.
Thilanka Ranaweera	08/19 – present, doctoral, Plant Biology
Siobhan A. Cusack	05/17 – 10/20, doctoral, Cell & Mol Biol
Christina B. Azodi	08/14 – 09/19, doctoral, Plant Biology; Data Scientist, Bayer
Alexander E. Seddon	08/13 – 05/15, MS, Plant Biology; Course coordinator, MSU
Bethany M. Moore	08/13 – 10/19, doctoral, Plant Biology; Postdoctoral Associate, University of Wisconsin-Madison
Johnny P. Lloyd	08/12 – 10/17, PhD, Plant Biology; Data Scientist, Bayer

Nicholas L. Panchy	05/12 – 11/17, PhD, Genetics; Institute of Cyber-Enabled Research Consultant, MSU
Sahra Uygun	05/11 – 03/17, PhD, Genetics; Bioinformatician, Agendia Inc.
Guangxi Wu	05/09 – 09/13, PhD, Cell & Mol Biol; Research Scientist, Zymo Research
Shan Yin	09/08 – 06/10, MS, Plant Biology
Gaurav Moghe	05/07 – 10/13, PhD, Genetics; Assistant Professor, Cornell University

Advising, Post-Doctoral Scholars

Paulo Izquierdo Romero	03/23 – present, MSU
Rajneesh Singhal	01/23 – present, MSU
Peipei Wang	03/16 – 6/22, Professor/Ressercher, Kunpeng Institute of Modern Agriculture, Fosan, China
Z. Tsung-Yeh Tsai	03/15 – 11/16, Bioinformatics Scientist, Illumina Inc.
Ming-Jung Liu	02/13 – 1/16, Assistant Research Fellow, Academia Sinica, Taiwan
Kelian Sun	10/09 – 12/11, Postdoctoral Associate, MSU
Cheng Zou	08/06 – 06/11, Research Associate, Inst. Of Biotech. Cornell Univ.
Kousuke Hanada	05/06 – 05/07, Associate Professor, Kyushu Inst. of Tech., Japan

Student awards/honors

Brianna Brown	04/21, MSU Enrichment Fellowship
Christina Azodi	01/19, ASPB Travel Award
Bethany Moore	05/18, Fields Award - Outstanding Teaching by a Graduate Student, Plant Biology, MSU
Christina Azodi	05/18, NSF Graduate Research Opportunities Worldwide Fellowship
Christina Azodi	05/18, Flash Talk Competition Winner, Great Lakes Bioenergy Research Center
Christina Azodi	03/18, Poster Competition 2nd place, Fate of the Earth Conference
Nicholas Panchy	05/17, Outstanding Graduate Student Award, Genetics, MSU
John Lloyd	04/17, Bessey Award for Outstanding Graduate Research, Plant Biology, MSU
Christina Azodi	01/16, ASPB Travel Award
Christina Azodi	06/15, NSF Graduate Research Fellowship
Zing Tsung-Yeh Tsai	06/15, ASBMB symposium 3rd Prize Poster Award
Christina Azodi	05/15, Penn. State Plant Biology Symposium Travel fellowship
Sahra Uygun	04/15, Dissertation Continuation Fellowship
Johnny Lloyd	03/15, 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	05/13, Outstanding Graduate Student Award, Genetics, MSU
Johnny Lloyd	07/12, Mericle Fellowship, Plant Biology, MSU
Guangxi Wu	05/12, Dissertation Continuation Fellowship, College of Natural Sciences, MSU
Gaurav Moghe	05/12, Dissertation Completion Fellowship, College of Natural Sciences, MSU
Alex Seddon	05/12, NSF Robert Noyce Teacher Scholarship
Nick Panchy	09/11, University Distinguished Fellowship, MSU
Manali Naik	01/11, Intel Science Talent Search, semi-finalist 10/10, Siemens Competition, semi-finalist
Stephanie Plotas	03/10, The Patricia E. and Jerry C. Wagner Endowed Scholarship in Elementary Education

Cheng Zou	04/09, Outstanding Research Award, Gene Expression in Development & Disease Program, MSU
Emma Conner & Madalyn Parker	03/09, 1st place in team competition, Southwest Michigan Science and Engineering Fair
Amanda Tabbert	05/08, Dortha E. and John D. Withrow Endowed Scholarship
Gaurav Moghe	09/07, Graduate Fellowship, the Gene Expression in Development & Disease Program, MSU

Graduate Student Committee

Name	*Department/Program**	*Degree*	*Student since*	*On since*	*Graduated*
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	
Brijen Babulal Miyani	Environ. Engr.	PhD	20	11/20	
Huan Chen	Genetics & Genomic Sci	PhD	19	09/20	
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 Maβ	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

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

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 3/22
Yuying Xie	Comp. Math. Sci. & Engr.	1/18	
Daniel Chitwood	Horticulture/Comp. Math. Sci. & Engr.	1/18	
Robert VanBuren	Horticulture	1/18	
Chad Niederhuth	Plant Biology	1/17	

Service & outreach

University/College Committees

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

9/21-22	Temporary mentor for incoming graduate student	Help mentoring incoming students before they choose a lab for the Bio-Molecular Science Program.
09/01/18 - 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.
03/24/15	Plant Science Graduate Student Symposium	I served as a judge for student presentation.
03/17/15	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.
04/13	Initiative for Data-Intensive Biology	Together with 19 other faculty, we prepared a white paper for the named initiative in campus.
02-05/09	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.
09-12/08	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

9/22-current	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

* CMSE: Computational Mathematics, Science, & Engineering

Committees for other departments/programs

01/17-12/18	Genetics Graduate Program, Associate Director
09/16-04/17	Plant Resilience Institute Faculty Search Committee (Global Impact Initiative)
07/16-05/17	CMSE, Bioinformatics Coordinator Search Committee
09/15-05/17	Plant Computational Genomics Faculty Search Committee (Global Impact Initiative)
09/15-08/18	CMSE, Curriculum Committee (also listed in teaching)
09/15-05/16	CMSE, Data Science Faculty Search Committee
10/14-03/15	CMSE, Stat. & Prob. Faculty Search Committee
09/14-08/15	CMSE, Faculty hiring umbrella committee
05/13-05/15	Genetics Graduate Program, Executive Committee
09/11-05/12	Biomolecular Science Admission Committee
06/10-07/11	Gene Expression of Disease & Development Program, 2011 meeting committee
07/09-05/10	Dept Biochemistry & Molecular Biology, Plant Science Excellence Search Committee
01/08-10/09	Quantitative Biology & Modeling Initiative, Public Relations Committee
06/08-05/09	Gene Expression of Disease & Development Program, Hannah Chair Search

Other major outreach activities

5/21/22	Girl's Math and Science Day	Graduate student Ally Schumacher and Kenia Segua 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 *Girls who Code at the Library* activity for grade school girls 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 Hight School, Holt, MI to explore the possibility of getting laboratories to donate used equipments 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.