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Education

Ph.D. (biology), Stanford University, Molecular genetic analysis of cell separation during *Arabidopsis thaliana* pollen development, 1998
B.A. (biology), Swarthmore College, 1992

Employment

Founding Director, Center for Sustainable Plant Resilience and Innovation through International Teamwork (C-SPIRIT), 2025-present
Director, Plant Resilience Institute (PRI), Michigan State University, 2023-present
MSU Research Foundation Professor, Biochemistry and Molecular Biology, Plant Biology, and Plant, Soil, and Microbial Sciences, Michigan State University, 2023-present
Founding Director, Water and Life Interface Institute (WALII), 2022-present
Senior Staff Scientist, Department of Plant Biology, Carnegie Institution for Science, 2018-2023
Acting Director, Department of Plant Biology, Carnegie Institution for Science, 2016-2018
Staff Scientist, Department of Plant Biology, Carnegie Institution for Science, 2005-2016
Staff Associate, Department of Plant Biology, Carnegie Institution for Science, 1999-2005
Founding Director, the *Arabidopsis* Information Resource (TAIR), Department of Plant Biology, Carnegie Institution for Science, 1999-2005
Database Curator, *Arabidopsis thaliana* Database (AtDB), Department of Genetics, Stanford University, 1998-1999
Independent Science Education Film Producer, Celadon Films, 1998-1999
Research Associate, Department of Plant Biology, Carnegie Institution for Science, 1994-1998
Research Associate, Department of Biochemistry, Stanford University, 1993-1994
Research Assistant, Biology Department, Swarthmore College, 1990-1992
Research Intern, Johns Hopkins University School of Medicine, 1990 (summer)

Professional Services

Scientific Advisory Boards and Committees (active)

Senior Scientific Advisor, JR Biotek Foundation (2022-present)
Chair, Steering Committee, Plant Cell Atlas (2021-present)
Scientific Advisory Board, Gene Ontology Consortium (2019-present)
Scientific Advisory Board, Joint Genome Institute's Plant Group (2015-present)
Scientific Advisory Board, Protein Data Bank (2009-present)

Scientific Advisory Boards and Committees (past)

External Advisory Board for UNL Plant Transformation Director transition (2023-2024)
Evaluator, European Research Council (ERC) Impact on Scientific Progress in Crop Production - Biological basis, genetic engineering (2022)
Member, DOE Biological and Environmental Research Advisory Committee's Subcommittee Working Group on Biodesign (2021-2022)
Committee of Visitors, DOE Biological Systems Science Division (2021)
Advisory Committee, DOE Joint Genome Institute (2020-2023)
Scientific Advisory Board, Phylos, Inc. (2018-2023)
ASPB Award Nominations Committee (2018-2021)
Advisory Committee, IPMB conference (2018)
Scientific Advisory Board, VIB Department of Plant Systems Biology, Belgium (2016-2017)
Advisor, Program for International Consortia and Collaboration on Agribioinformatics in National Agricultural Genome Program (PICCAN) in Korea (2016-2017)
Scientific Advisory Board, NSF C3-C4 Photosynthesis Project (2012-2013)
Member, Nominating Committee for the International Society of Biocuration's Executive Committee (2009-2010)
Member, Nominating Committee for Plant Cyberinfrastructure Board of Directors (2007)
Scientific Advisory Board, Value-directed Evolutionary Genomics Initiative (VEGI) (2010-2014)
Scientific Advisory Board, CropLink Global Database (2006-2009)
Steering Committee Member, International Solanaceae Genome Initiative (2004-2008)
Scientific Advisory Board, Saccharomyces Genome Database (SGD) (2003-2006)
Scientific Advisory Board, GrainGenes (2003-2006)
Scientific Advisory Board, Cornell Genomics (2002-2006)
Scientific Advisory Committee, ChromDB (2001-2004)

Grant Review Committees

NSF (2021, 2020, 2018, 2016, 2015, 2014, 2012, 2011, 2008, 2006)
DOE (2018); USDA-ARS (2002)
NHGRI (2002)

International Conference Organization Committees

Co-organizer, Third International Plant Systems Biology Conference (2026)
Lead organizer, First Great Lakes Plant Science Conference (2025)
DOE AI in Biology Workshop (2025)
2025 ICAR Science Organising Committee (2025)
Lead organizer, First International Plant Resilience Summit (2024)
Lead organizer, Gordon Research Conference on Single-Cell Approaches in Plant Biology (2023)
A Plenary session organizer, ASPB 2023 Conference (2023)
Co-organizer, Phytochemical Society of North America Conference, East Lansing, MI (2023)
Co-organizer, 20th National Plant Biochemistry and Molecular Biology Congress, Mexico (2023)
Co-organizer, Second Plant Cell Atlas Consortium (2022)
Lead organizer, First Plant Cell Atlas Symposium (2021)
Scientific Organizing Committee, VIB conference Plant Science for Climate Emergency (2021)
Lead organizer, First Plant Cell Atlas Workshop (2020)
Co-organizer, 2nd Plant Systems Biology Conference (2020)

Co-organizer, Plant Genomes, Systems Biology, and Engineering Conference at Cold Spring Harbor Laboratory (2017, 2019, 2021)
Co-organizer, Fourth Conference of International Society for Biocuration (2010)
Lead organizer, Second International Biocurators meeting (2007)
Co-organizer, Solanaceae Genomics meeting (2007)
Lead organizer, First International Biocurators Conference (2005)
Co-organizer, NSF sponsored workshop on 'National Plant Synthesis Center' (2005)

Scientific Journal Editorial Boards

Guest Editor, Focus Issue on Plant Cell Atlas, Plant Physiology (2021)
Advisory Editor, Plant & Cell Physiology (2020-2023)
In silico Plants Editorial Board (2018-present); Associate Editor, Molecular Plant (2014-2019)
Monitoring Editor, Plant Physiology (2002-2008, 2013-2016, 2021)

Carnegie Institution for Science Services

Pasadena Life Science Division Building Committee (2020-2021)
Deputy Organizer for Carnegie Workshop on Genomes to Ecosystems (2019)
Faculty Advisor for Intrinsically Disordered Proteins Scientific Interest Group (2018-present)
Faculty Advisor for DPB Website (2019)
Carnegie's Center for Scientific Computation Committee (2014-2016)
Carnegie Summer Internship Program Coordination (2013-2016)
DPB IT Committee (2012-2016)
Departmental Website Design (2010)
Carnegie Seminar Organization (2008-2010)
Departmental Website Design (2002)
Internal Seminar Series Initiation and Organization (2000-2001)

Michigan State University Services

PLB Awards Committee Interim Chair (2025-2026)
BMS Admissions Committee (2024-2025)
PRL Director Search Committee (2024-2025)
BMB Strategic Planning Committee (2024-2025)
MSU Plant Science Excellence Training Group Organizer (2023-present)
Executive Committee Member, NIH Plant Biotechnology for Health and Sustainability (PBHS) Training Program (2023-present)

Ph.D. Thesis Committees

Active

Jenny Schuster (MSU, 2024-)
Gloria Baker (MSU, 2024-)
Daniel Mok (MSU, 2024-)
Cathy Mercado (MSU, 2023-)
Angel McKay Whiteman (MSU, 2023-)
Bailey Kleven (MSU, 2023-)

Past

Laleh Dinpazhouh (MSU, 2024-2025)
Lucero Elizabeth Rogel (Stanford, 2020-2024)

Faculty Mentoring

Aleksandra Skirycz (2024-)
Thelma Madzima (2023-)

Awards

MSU College of Natural Science Research Leadership (2025)
SEB's Woolhouse Plenary Lectureship (2024)
NSF Predoctoral Fellowship (1993-1996)
NSF/DOE/USDA Plant Training Grant Fellowship (1992-1993)
Sigma Xi National Society (1991-1992)
Howard Hughes Undergraduate Research Fellowship (1990-1991)
National Honors Society (1988)

Scientific Society Memberships

American Society for Biochemistry and Molecular Biology (2023-present)
American Society of Cell Biologists (2016-present)
American Society of Plant Biologists (2010-present)
American Association for the Advancement of Science (2010-2021, 2024-present)

Contribution to Science

1. From discovering cell separation mechanisms to centromere mapping

My early work in graduate school focused on understanding how plant cells separate, which is rare in plants because cells are connected by walls. However, cell separation occurs during male gametogenesis in many plants to create individual pollen grains. Through molecular genetics, cell biological, and biochemical approaches, I identified a class of mutants called *quartet,* which are required for cell separation, and subsequently determined the molecular nature of the defects through gene cloning and molecular and biochemical characterization. Using immunolocalization and biochemical analyses, I showed that the phenotype resulted from defects in degrading the temporary cell wall before the secondary cell wall is deposited from the maternal tissue. I then cloned one of the genes, which encoded a pectin methylesterase, the first cell wall degrading enzyme with a demonstrated function *in vivo*. The *quartet* strains are still the *de facto* lines for plant scientists to study a variety of topics including gametophytic function, meiotic drive, genome stability, and centromere mapping. The strains have been used to map Arabidopsis centromeres, which was instrumental in refining the physical map and completing the genome sequencing. In the future, these strains could enable the creation of artificial plant chromosomes.

Preuss D, Rhee SY, and Davis RW. (1994) Tetrad analysis possible in Arabidopsis with mutation of the QUARTET (QRT) genes. **Science** 264(5164):1458-60.

Rhee SY and Somerville CR. (1998) Tetrad pollen formation in quartet mutants of *Arabidopsis thaliana* is associated with persistence of pectic polysaccharides of the pollen mother cell wall. **Plant Journal** 15(1):79-88.

Rhee SY, Osborne E, Poindexter P, and Somerville, CR (2003) Microspore separation in the *quartet 3* mutants of Arabidopsis is impaired by a defect in a developmentally regulated pectinase required for pollen mother cell degradation. **Plant Physiology** 133(3):1170-80.

2. Establishing and enabling systems and omics biology

As genome sequencing became feasible towards the end of my graduate work, I became interested in the possibility of genome-enabled biology to understand the functions of all genes and pathways encoded in a genome and elucidate how organisms are hard- and soft-wired. As an early career investigator at Carnegie, I led a team of biologists and software engineers to create a computational infrastructure called the Arabidopsis Information Resource (TAIR) to collect and encode all available genomic and literature data to be computable by algorithms and easily accessible by researchers. TAIR has been a primer for revolutionizing plant research by enabling systematic and quantitative analyses of biological functions and pathways. Over time, TAIR has been used by 6.8 million people. Some 20,000 scientists around the world are still actively using it. In addition, my group was one of the early developers of the Gene Ontology (GO) system where we contributed to making the system work for plant genomes. GO is a shared, controlled and structured vocabulary for describing gene attributes. GO has been instrumental in analyzing and interpreting genomic and post-genomic data across many organisms, including many studies of various human diseases. GO has been mentioned in more than 26,000 articles, which have been cited over 580,000 times without self-citations.

The Gene Ontology Consortium (2001) Creating the Gene Ontology Resource: Design and Implementation. **Genome Research** 11(8):1425-1433.

Rhee SY, Beavis W, Berardini TZ, Chen G, Dixon D, Doyle A, Garcia-Hernandez M, Huala E, Lander G, Montoya M, Miller N, Mueller LA, Mundodi S, Reiser L, Tacklind J, Weems DC, Wu Y, Xu I, Yoo D, Yoon J, Zhang P. (2003) The Arabidopsis Information Resource (TAIR): a model organism database providing a centralized, curated gateway to Arabidopsis biology, research materials and community. **Nucleic Acids Research** 31(1):224-228.

Howe D, Costanzo M, Fey P, Gojobori T, Hannick L, Hide W, Hill DP, Kania R, Schaeffer M, St. Pierre S, Twigger S, White O, and Rhee SY (2008) The future of biocuration. **Nature** 455:47-50.

3. Revealing functions of unknown genes

One of the biggest problems facing biology in the post-genome era is that we still do not know the functions of many genes (25%-75% of protein-encoding genes are not even predictable for their function based on sequence similarity), even for intensively studied organisms such as *E. coli*, yeast, and human. We developed several systematic approaches to determine functions of unknown genes in the model plant *Arabidopsis thaliana*. First, to systematically infer functions of genes and group them into pathways, my group collaborated with Dr. Ed Marcotte's group to create the first plant genome-wide co-function network called AraNet, which has been used to systematically identify new genes in pathways and infer functions of uncharacterized genes based on the functions of their network neighbors. Second, we collaborated with Dr. Wolf Frommer's group to develop high-throughput experimental and computational pipelines to systematically identify interactions between membrane proteins and signaling proteins, testing over 6 million binary interactions between 3000 proteins. To date, this is still the largest eukaryotic membrane protein interaction network (such a network previously existed only for

yeast, at ~10% of the scale). The vast majority of the membrane protein interactions we found had never before been identified. Third, we developed a computational pipeline to identify novel transcriptional regulators using non-sequence similarity approaches, and discovered a novel water sensor that is required for seed germination, FLOE1, and a gene family that controls the transition between proliferation and differentiation in leaves, CHIQUITA. We continue to explore systematic ways to accelerate gene function discovery.

Lee I, Ambaru B, Thakkar P, Marcotte E, and Rhee SY (2010) Rational association of genes with traits using a genome-scale gene network for Arabidopsis thaliana. **Nature Biotechnology** 2(28):149-156.

Jones AM, Xuan Y, Xu M, Wang R-S, Ho C-H, Lalonde S, You CH, Sardi MI, Parsa SA, Smith-Valle E, Su T, Frazer KA, Pilot G, Pratelli R, Grossmann G, Acharya BR, Hu HC, Engineer C, Villiers F, Ju C, Takeda K, Su Z, Dong Q, Assmann SM, Chen J, Kwak JM, Schroeder JI, Albert R, Rhee SY, and Frommer WB (2014) Border control – a membrane-linked interactome of Arabidopsis. (2014) **Science** 344:711-716.

Bossi F, Fan J, Xiao J, Chandra L, Shen M, Dorone Y, Wagner D, Rhee SY (2017) Systematic discovery of novel eukaryotic transcriptional regulators using sequence homology independent prediction. **BMC Genomics** 18(1):480

Dorone Y, Boeynaems S, Jin B, Bossi F, Flores E, Lazarus E, Michiels E, De Decker M, Baatsen P, Holehouse AS, Sukenik S, Gitler AD, Rhee SY (2021) Hydration-dependent phase separation of a prion-like protein regulates seed germination during water stress. **Cell** 184(16), 4284-4298.e27. bioRViv 2020.08.07.242172; doi: https://doi.org/10.1101/2020.08.07.242172

Bossi F, Jin B, Lazarus E, Cartwright H, Dorone Y, Rhee SY (2021) *CHIQUITA1* maintains temporal transition between proliferation and differentiation in *Arabidopsis thaliana* **Development** 149(11):dev200565. doi: 10.1242/dev.200565 BioRXiv 2021.11.24.469926; doi:10.1101/2021.11.24.469926

4. Systems biology of plant metabolism and enabling metabolic engineering

Plant metabolism plays a vital role in the health and well-being of our society. Despite our dependence on plants for energy, nutrition, and medicine, plant metabolism remains a surprisingly understudied field. For example, more than 30% of all pharmaceuticals are based on plant natural products, yet our knowledge of plant metabolic pathways accounts for less than 0.1% of the metabolites thought to exist in flowering plants. Understanding how plants evolved this prodigious chemical vocabulary has been a longstanding goal in plant biology. Our group developed computational pipelines that systematically annotate enzyme function on the genome-scale. Using this system, we created a unique, unified resource of plant metabolic networks and discovered several properties that illustrate the differential evolution of secondary metabolism, permitting elucidation of novel secondary metabolic pathways. This opportunity is particularly relevant because secondary metabolites often confer upon plants the ability to survive major biotic and abiotic threats, and are the major sources of medicine, fragrance, and flavor. Thus, the molecular components involved in the production of secondary metabolites are a source of great interest across many fields of research, including agricultural biotechnology, synthetic biology, and biomedical and pharmaceutical research.

Mueller LA, Zhang P, and Rhee SY (2003) AraCyc. A Biochemical Pathway Database for Arabidopsis. **Plant Physiology** 132(2):453-60.

Zhang P, Dreher K, Karthikeyan A, Chi A, Pujar A, Caspi R, Karp P, Kirkup V, Latendresse M, Lee C, Mueller LA, Muller R, and Rhee SY (2010) Creation of a Genome-Wide Metabolic

Pathway Database for *Populus trichocarpa* Using a New Approach for Reconstruction and Curation of Metabolic Pathways for Plants. **Plant Physiology** 153(4):1479-91.
Chae L, Kim T, Dreher K, and Rhee SY (2014) Genomic signatures of specialized metabolism in plants. **Science** 344:510-513
Schalpfer P, Zhang P, Chuan W, Kim T, Banf M, Chae L, Dreher K, Arvind C, Nilo-Poyanco R, Bernard T, Kahn D, and Rhee SY (2017) Genome-wide prediction of metabolic enzymes, pathways, and gene clusters in plants. **Plant Physiology** 173(4):2041-2059
Kang S-H, Pandey RP, Lee C-M, Jeong J-T, Choi B-S, Sim JS, Jung M, Won SY, Oh T-J, Yu Y, Lee OK, Kim HH, Lee T-H, Kim N-H, Bashyal P, Kim T-S, Kim C-K, Kim J-S, Ahn B-O, Rhee SY, Sohng JK (2020) Genome-enabled discovery of anthraquinone biosynthesis in *Senna tora.* **Nature Communications** 11, 5875.
Hawkins C, Ginzburg D, Zhao K, Dwyer W, Xue B, Xu A, Rice S, Cole B, Paley S, Karp P, and Rhee SY (2021) Plant Metabolic Network: A comprehensive resource of plant metabolic information. **Journal of Integrative Plant Biology**. https://doi.org/10.1111/jipb.13163

5. Transcriptional regulation and bioengineering

Transcriptional regulation is fundamental in biology and has been the subject of an intensive study. However, molecular, genetic, and evolutionary studies suggest that there must be additional layers of control that have not been discovered. To investigate one of such layers, we used an integrated approach (computer science, genetics, genomics, proteomics, molecular evolution, development, and stress physiology) to uncover new layers of transcriptional regulation. First, we discovered a widespread occurrence of transcription factor-like proteins without a DNA binding domain, coined microProteins (miPs), which regulate evolutionarily related transcription factors. We found over 400 putative miPs in Arabidopsis along with their putative target transcription factors and their respective biological pathways. In collaboration with experimental biologists at Carnegie and Stanford, we experimentally validated two novel miPs and their predicted target transcription factors using genetic, molecular, and biochemical experiments as a proof-of-concept. Second, we discovered a new type of bivalent chromatin that we coined ‘kairostat’, which regulates the timing of gene expression for defense compound biosynthesis in response to pathogen attack. Third, we developed condition-specific genome-scale gene regulatory networks, which led to the discovery of several master regulators that control both growth and defense (manuscript in prep.).

Magnani E, De Klein N, Nam H-I, Kim J-G, Pham KL, Fiume E, Mudgett MB, and **Rhee SY** (2014) A comprehensive analysis of microProteins reveals their potentially widespread mechanism of transcriptional regulation. **Plant Physiology** 165(1):149-15.
Banf M and **Rhee SY** (2017) Enhancing gene regulatory network inference through data integration with markov random fields. **Nature Scientific Reports 7**:41174
Zhao K, Kong D, Jin B, Smolke CD, Rhee SY (2021) A Novel Form of Bivalent Chromatin Associates with Rapid Induction of Camalexin Biosynthesis Genes in Response to a Pathogen Signal in Arabidopsis. **eLife** https://elifesciences.org/articles/69508

6. Single-Cell Plant Biology

To supercharge our ability to understand how plants work, we need to quantitatively understand the dynamic molecular organization of plant cells and their functions at the level of individual cells. For this, we need a solid infrastructure that can incorporate and codify the theoretical and empirical data of plant cells, a task too big to tackle for a single group. Therefore, we want to create a community that includes scientists from plant biology, data science, AI, imaging, proteomics, single cell profiling and nanotechnology to lay the groundwork for creating a

comprehensive understanding of the dynamic molecular organization of plant cells, an initiative we are calling the Plant Cell Atlas (PCA). We have successfully kickstarted the PCA community-building activities in 2020 with three digital workshops on the vision, technologies and broader impacts of the PCA. Because of COVID-19, our original plan for an in-person gathering of 70 scientists, mostly senior faculty, turned into three virtual workshops, each of which drew over 400 scientists (70% early career) participating from around the world. The PCA community currently has over 800 members with over 150 scientists actively collaborating in SLACK.

Rhee SY, Birnbaum KD, Ehrhardt DW (2019) Towards Building a Plant Cell Atlas. **Trends in Plant Science** 24(4):303-310

Rice S, Fryer E, Ghosh Jha S, Malkovskiy A, Meyer H, Thomas J, Weizbauer R, Zhao K, Birnbaum KD, Ehrhardt DW, Wang Z, Rhee SY, and The Plant Cell Atlas Consortium (2020) First Plant Cell Atlas Workshop Report. **Plant Direct** 00: 1– 10. https://doi.org/10.1002/pld3.271

Plant Cell Atlas Consortium, Ghosh Jha S, Borowsky AT, Cole BJ, Fahlgren N, Farmer A, Huang SC, Karia P, Libault M, Provart NJ, Rice SL, Saura-Sanchez M, Agarwal P, Ahkami AH, Anderton CR, Briggs SP, Brophy JAN, Denolf P, Di Costanzo LF, Exposito-Alonso M, Giacomello S, Gomez-Cano F, Kaufmann K, Ko DK, Kumar S, Malkovskiy AV, Nakayama N, Obata T, Otegui MS, Palfalvi G, Quezada-Rodríguez EH, Singh R, Uhrig RG, Waese J, Van Wijk K, Wright RC, Ehrhardt DW, Birnbaum KD, Rhee SY (2021) Vision, challenges and opportunities for a Plant Cell Atlas. **eLife** DOI: 10.7554/eLife.66877

Eckelbarger M, Rice S, Osano A, Peng J, Ullah H, Rhee SY (2021) Recognizing Pioneering Black Plant Biologists in Our Schools and Society. **Trends in Plant Science** http://doi.org/10.1016/j.tplants.2021.07.021

Invited Seminars and Symposia

1. Agricultural Genomics Conference, San Diego, CA (1999)
2. Advances in Genomic Research, Potentials and Applications, San Francisco State University, SF, CA (1999)
3. Genomic *Arabidopsis* Resource Network Workshop, York, UK (2000)
4. NSF Workshop on U.S.-Australia Interactions, Washington D.C. (2000)
5. York University, York, UK (2000)
6. The Institute for Genome Research (2000)
7. Oxford University, Oxford, UK (2000)
8. Lorne Genome Conference, Melbourne, Australia (2001)
9. University of Arizona, Tucson, AZ (2001)
10. Plant Gene Expression Center, Albany, CA (2001)
11. Entigen, Sydney, Australia (2001)
12. Cornell University, Ithaca, NY (2001)
13. Seoul National University, Seoul, South Korea (2001)
14. AAAS Annual Meeting, San Francisco, CA (2001)
15. Plant & Animal Genome IX Conference, San Diego, CA (2001)
16. Mini-symposium on Plant Bioinformatics, KRIBB, Daejon, South Korea (2001)
17. Plant Genome Awardees Meeting, San Diego, CA (2002)
18. Future of the National Plant Genome Initiative, National Academy of Sciences, Washington DC (2002)
19. National Science Foundation Managing Plant Genomic Resources Workshop, Asilomar, CA (2002)

20. International Horticultural Congress, Toronto, Canada (2002)
21. University of California at Riverside, Riverside, CA (2002)
22. University of Guelf, Guelf, Canada (2002)
23. VIB, University of Gent, Gent, Belgium (2003)
24. 2nd International Conference on Plant Metabolomics, Postsdam, Germany (2003)
25. Digital Archives for Science & Engineering Resources (DASER) Symposium (2003)
26. Crop Functional Genomics (2004)
27. 7th International Plant Cold Hardiness Symposium (2004)
28. Seoul National University, Seoul, South Korea (2004)
29. University of Missouri, Columbia (2004)
30. Plant Gene Expression Center, Albany, CA (2004)
31. Iowa State University (2007)
32. U.C. Riverside (2007)
33. University of Calgary, Canada (2007)
34. National Research Center-Plant Biotechnology Institute, Saskatoon, Canada (2007)
35. Danforth Center, MO (2007)
36. Solanaceae Genomics Meeting, Jeju Island, S. Korea (2007)
37. Korea Genome Organization Meeting, Seoul, S. Korea (2007)
38. iPlant Kick-off Conference, Cold Spring Harbor Labs, NY (2008)
39. American Society of Plant Biologists Conference, Merida, Mexico (2008)
40. Banff Plant Metabolism Conference, Banff, Canada (2008)
41. Dow Agrosciences (2010)
42. U.C. Riverside (2010)
43. International Conference on *Arabidopsis* Research (2010)
44. A Current Opinion Conference on Plant Genome Research, Amsterdam, the Netherlands (2011)
45. Alliance of Independent Plant Institutes Meeting, St. Louis, MO (2011)
46. ASMS Asilomar Conference on Mass Spectrometry, Asilomar, CA (2011)
47. U. Florida (2011)
48. Michigan State U. (2011)
49. Phenotype Ontology RCN, NASCent, Durham, NC (2012)
50. Plant Genomics in China XIII, Tai'an, China (2012)
51. Microbial and Plant Genomics Institute (MPGI) Symposium on Systems Biology of Genetic Regulation, St. Paul, MN (2012)
52. International Symposium on Root Systems Biology, Taipei, Taiwan (2012)
53. Danforth Center (2012)
54. National Cheng Kung U., Taiwan (2012)
55. Evolution of Metabolic Diversity, Banbury, NY (March 2013)
56. Washington State U. (April 2013)
57. UC Davis (May 2013)
58. Alliance of Independent Plant Institutes Meeting, Ithaca, NY (May 2013)
59. Plants and People Conference, Berlin, Germany (June 2013)
60. University of Missouri-Columbia (Oct 22, 2013)
61. Meeting on the Genetic Basis of Unintended Effects in Modified Plants, Ottawa, Canada (Jan 14-15, 2014)
62. JGI DOE Conference: "Genomics of Energy and the Environment" (March 24-25, 2015)
63. San Francisco State University (April 23, 2015)
64. Penn State Plant Biology Symposium: "Plant Stress-omics in a Changing Climate" (May 13-16, 2015)
65. Molecular Plant Symposium, Beijing, China (Aug 5-8, 2015)
66. Second Genome (Nov 9, 2015)

67. Plant Genomes & Biotechnology: From Genes to Networks, CSHL, NY (Dec 2-5, 2015)
68. Louisiana State U. (Feb 22, 2016)
69. Plant Gene Expression Center, Albany CA (March 10, 2016)
70. Langebio, the National Laboratory of Genomics for Biodiversity, Mexico (May 10, 2016)
71. NAASC RCN: Arabidopsis Research and Training for the 21st century (May 13-15, 2016)
72. ASPB Conference, Plant Cell Symposium: New Biological Insights from Large-Scale Biology, Austin TX (July 9-13, 2016)
73. MSU - Plant Biotechnology for Health and Sustainability Annual Symposium (Oct 26-27, 2017), East Lansing, MI
74. First International Plant Systems Biology Conference (Sept 10-14, 2018), Roscoff, France
75. VIB, Ghent, Belgium (Sept 17, 2018)
76. U. Maryland at College Park (Nov 15, 2018)
77. UC Davis Plant Symposium (April 8, 2019)
78. Danforth Center (May 2019)
79. Plants of the Future, NYU NY (June 13-14, 2019)
80. 2019 Plant Science Symposium on Plant Metabolism and Engineering, UNL, NB (Oct 17-19, 2019)
81. LBNL Single Cell Solutions for Energy and Environment (Jan 23, 2020)
82. DOE BER Genome Science Program Meeting (Feb 23-26, 2020)
83. ASPB / Plantae Global Virtual Plant Research Seminar Series (June 16, 2020)
84. ASPB 2020 (Jul 25-29, 2020)
85. U. Kentucky (Nov 12, 2020)
86. Australian Bioinformatics and Computational Biology Society Conference 2020 (Keynote, Nov 24-26, 2020)
87. Washington State U. (Dec 17, 2020)
88. Williams College (April 9, 2021)
89. Cornell University Plant Breeding Symposium (April 23, 2021)
90. Cell Atlas workshop at EMBL-EBI Industry Programme (May 12-13, 2021)
91. EMSL (Aug 17, 2021)
92. UC Riverside (Nov 10, 2021)
93. Bowie State University (Nov 17, 2021)
94. CalTech-Carnegie Joint Research Workshop on Life Sciences and Ecology (Nov 19, 2021)
95. Western Regional Seed Physiology Research Group Annual Symposium, Virtual (Jan 25, 2022)
96. Digital Carnegie Science Program, Virtual (Jan 25, 2022)
97. Washington State U, Virtual (Feb 7, 2022)
98. U. Georgia's Plant Center Spring Symposium, Virtual (Feb 21, 2022)
99. DOE BER Genome Science Meeting, Virtual (Feb 28-Mar 2, 2022)
100. 31st Western Photosynthesis Conference (Mar 24-25, 2022)
101. MSU NRT-IMPACTS Symposium, Virtual (Apr 11-12, 2022)
102. UC Riverside (Apr 15, 2022)
103. U. Wisconsin-Madison, Virtual (Apr 21, 2022)
104. K-BioX Global Class Seminar, Virtual (Aug 23, 2022)
105. Gregor Mendel Institute, Virtual (Oct 7, 2022)
106. EMSL Seminar (Oct 22, 2022)
107. UNL Plant Sciences Retreat (keynote, Nov 10-11, 2022)
108. 2023 William F. Hanna Memorial Lecture, U. Manitoba, Canada (Feb 16-17, 2023)
109. U. Kentucky Biology Graduate Student Association Seminar (Mar 9, 2023)
110. Maize Genetics Conference (plenary, St. Louis, MO, Mar 16-19, 2023)
111. Norwich Single Cell Consortium (keynote, May 3, 2023)
112. The Sainsbury Laboratory Student Colloquium (May 4, 2023)

113. Biodiversity Cell Atlas Workshop, Barcelona, Spain (May 15-16, 2023)
114. AG2PI Conference: Mapping the Future of Agricultural Genome to Phenome Research, Kansas City, MO (June 15-16, 2023)
115. Seoul National University, Korea (July 3, 2023)
116. IPGSA2023, Korea (July 4-8. 2023)
117. National Institute of Agricultural Sciences, Korea (July 12, 2023)
118. The 62nd annual meeting of the Phytochemical Society of North America (plenary, July 16-20, 2023)
119. ASPB Concurrent Symposium on Plant Resilience and Climate Change, Savannah, GA (Aug 5-8, 2023)
120. UNAM, Mexico (Aug 21, 2023)
121. Lengebio, Irapuato, Mexico (Aug 25, 2023)
122. Center for Plant Biology Annual Symposium, Purdue University (keynote, Sept 8, 2023)
123. Indiana University (Sept 27, 2023)
124. National Coalition for Food and Agricultural Research Lunch-N-Learn, Washington DC (Sept 28, 2023)
125. The Weill Institute Symposium, Cornell University (Oct 10, 2023)
126. Cell and Molecular Biology Program at MSU Annual Research Symposium, MSU (Oct 13, 2023)
127. The Future of Plant-Environment Interactions: Challenges and Opportunities in a Changing Climate, Banbury, CSHL, NY (Oct 29-Nov 1, 2023)
128. MSU Research Foundation Board of Directors Meeting (Dec 8, 2023)
129. NSF BII Awardees Meeting, Alexandria, VA (Jan 21-22, 2024)
130. EMBO|EMBL Symposium "Diversity of plants: from genomes to metabolism, Heidelberg, Germany (plenary, Apr 9-12, 2024)
131. Salk Institute (April 25, 2024)
132. USAIN/CBHL Biennial Conference 2024, MSU, MI (plenary, May 5-8, 2024)
133. 2024 PBHS Symposium, MSU, MI (May 20-21, 2024)
134. New Phytologist Next Generation Scientists, Duke U, NC (June 5-8, 2024)
135. Society of Experimental Biology 2024 Annual Conference, Prague, Czechoslovakia (Woolhouse Plenary Lecture, July 2-5, 2024)
136. ICAR 2024, San Diego, CA (plenary, July 15-19, 2024)
137. CRYO 2024 Conference, Washington, DC (July 23-25, 2024)
138. Copenhagen Plant Science Conference (keynote, Aug 21-23, 2024)
139. Joint Genome Institute's Annual Meeting (keynote, Sept 30-Oct 4, 2024)
140. Plant Sensory Biology Workshop (Oct 21-22, 2024)
141. University of Florida Plant Science Council (Jan 20-22, 2025)
142. University of Minnesota (February 18, 2025)
143. SynBSS (February 27, 2025)
144. Cologne Spring Meeting 2025 on Plant Ecological Genetics (Mar 25-27. 2025)
145. Max Planck Institute for Plant Breeding Research, Cologne, Germany (Mar 28, 2025)
146. Corteva R&D Laureate Community (Mar 31, 2025, virtual)
147. Tsukuba University, Tsukuba, Japan (April 8, 2025)
148. RIKEN Center for Sustainable Resource Science, Yokohama, Japan (April 10, 2025)
149. Gordon Research Seminar on Plant Metabolic Engineering, Barcelona, Spain (keynote, June 14-15, 2025)
150. The 20th International Congress of Developmental Biology, San Juan, Puerto Rico (Keynote, June 18-22, 2025)
151. 2025 American Society of Pharmacognosy Annual Meeting, Grand Rapids, MI, USA (plenary, Aug 2-6, 2025)

152. Cutting Edge Plant Biotechnology: Driving the Future of Agriculture, Tashkent, Uzbekistan (Keynote, Aug 25-27)
153. University of Florida (Oct 6, 2025)
154. SMB Conference on Plant Biology, Merida Mexico (keynote, Oct 20-24, 2025)
155. MSU Board of Trustees Meeting (Oct 31, 2025)
156. Pharmacology and Toxicology Seminar, MSU (Nov 12, 2025)
157. MSU Plant, Soil, and Microbial Sciences Seminar (Dec 10, 2025)
158. MSU Plant Research Laboratory Seminar (Feb 3, 2026)
159. UT Austin (Feb 4th, 2026)
160. University of Chicago (Feb 16 - 18, 2026)
161. PCA Single Cell Retreat (April 10, 2026)
162. GRC Salt and Water Stress in Plants, Switzerland (May 24-29, 2026)
163. ASPB Plant Biology 2026 - Ottawa, Canada (July 18 -22)

PEER REVIEWED PUBLICATIONS

1. Bethany Holland, Matt Stata, Purva Karia, Cheng Zhao, Seung Y. Rhee (**2026**) Two-cell metabolic modeling of *Sorghum bicolor* leaves to predict reactions that constrain growth under drought. *In preparation.*
2. Evan Saldivar, Seung Y. Rhee, Adrien Burlacot (**2026**) Carbon flow through the cyanobacterial carbon concentrating mechanism enables a robust nitrogen deprivation response. *In preparation.*
3. Karine Prado, Mingxun Wang, Abigail Tripka, Jazz Dickinson, Aleksandra Skirycz, Gaurav Dilip Moghe, Seung Y. Rhee (**2026**) Assigning biological meaning to unknown metabolites from metabolomics data. *In preparation.*
4. Purva Karia, William Dwyer, Ava Kloss-Schmidt, Charles Hawkins, Bo Xue, Maxine L Gutierrez, Daniel N Ginzburg, Ritesh Mewalal, Ian Blaby, David W Ehrhardt, Seung Y Rhee (**2026**) Sorghum metabolic atlas. *In preparation.* **BioRXiv** (2025) https://www.biorxiv.org/content/10.1101/2025.08.24.672047v1
5. Xing Wu, Ruth Epstein, Maliheh Esfahanian, Barsanti Gautam, Marcus Griffiths, Jules Perez, Kerrie Barry, Anna Lipzen, Chris Daum, Yuko Yoshinaga, Chanaka Roshan Abeyratne, Zhaslan Akhmetov, Sebastian Toro Arana, Ryan Bayliss, Bhabesh Borphukan, Anthony Brusa, Hari Chhetri, Rachel Combs-Giroir, Lucas Czech, Marcin K. Dyderski, Eva Serena Gjesvold, Grzegorz Grzejszczak, Shannon Hateley, Nicholas Heller, Danielle Hoffmann, Nikhil Jaikumar, Brice A. Jarvis, Vanessica Jawahir, Marcin Klisz, Peter Kruse, Matthew Lane, Arjuman Lima, Alexander Liu, Gabriela Madrid, Maggie Marlino, Michaela McGinn, Mirko Pavicic, William Perry, Manesh Shah, Jason Thomas, Alice Townsend, Thiranya L. Wanigarathna, Tad Wesley, Bryan Connolly, Yong Pyo Lim, Radosław Puchałka, Alexander Wirth, Andrea R. Gschwend, Pubudu P. Handakumbura, Daniel Jacobson, Dmitri A. Nusinow, Seung Y. Rhee, Karen A. Sanguinet, Christopher N. Topp, Jeremy Schmutz, M. David Marks, Winthrop Phippen, Ratan Chopra, John C. Sedbrook, Moisés Expósito-Alonso (**2026**) Population and adaptation history of 739 *Thlaspi arvense* natural accessions. *Under Revision* **Genome Biology BioRXiv** https://www.biorxiv.org/content/10.1101/2025.03.21.644658v1
6. Matt Stata, Sharon Greenblum, Purva Karia, Maxim Koriabine, Yuko Yoshinaga, Cheng Zhao, Ronan O'Malley, Seung Y. Rhee (**2026**) Cell-type-specific response to drought in Sorghum bicolor reveals novel targets for improving water use efficiency. *In preparation.* **BioRXiv** (2025) https://www.biorxiv.org/content/10.1101/2025.08.28.671794v1

7. Laura Leventhal, Megan R. Ruffley, Carnegie Field Consortium, Moises Exposito-Alonso (2026) Mutation load and local (mal)adaptation contribute to population vulnerability in a climate-manipulated common garden. *Under review.* **Nature Ecology and Evolution**
8. Sterling Field, John F. Ramirez, Yanniv Dorone, Thomas C. Boothby, Seung Y. Rhee (**2026**) FLOE1 maintains cellular viscosity in rehydrating Arabidopsis embryos. **New Phytologist** *Under revision*. **BioRXiv** (2025) https://www.biorxiv.org/cgi/content/short/2025.06.03.657678v1
9. Sterling Field, Yanniv Dorone, Will P. Dwyer, Renee Hastings, Madison Blea, Olivia M. S. Carmo, Dan Raba, John Froehlich, Ian S. Wallace, Steven Boeynaems, Seung Y. Rhee (**2026**) *Arabidopsis thaliana* RHAMNOSE 1 condensate formation drives UDP-rhamnose synthesis. **Current Biology** *Under revision.*
BioRXiv (2024) https://www.biorxiv.org/content/10.1101/2024.02.15.580454v1
10. Megan R Ruffley, Laura Levanthal, Shannon Hateley, Seung Y Rhee, Moises Exposito-Alonso (**2026**) Conflicts in natural selection constrain adaptation to climate change in *Arabidopsis thaliana*. **Nature Ecology & Evolution** *Under revision.* **BioRXiv** (2023) 2023.10.16.562583; doi: https://doi.org/10.1101/2023.10.16.562583
11. Gaurav Moghe, Alen Zimic-Sheen, Dijun Chen, Gitanjali Yadav, Guangshuo Cao, Hale Tufan, Jason Williams, Jędrzej Szymański, Jeongwoon Kim, Lucas Busta, Marek Mutwil, Miguel Verdu, Mirko Zimic, Nicholas Provart, Nokwanda Makunga, Olivia Wilkins, Qi Sun, Robert VanBuren, Rose Marks, Seung Y. Rhee, Yu Jiang, Yuying Xie (**2026**) Reimagining Plant Science Training in the Era of Generative AI: A Global Perspective. **Plant Cell** *Accepted.*
12. Meyer, E., Saldivar, E.V., Kokot, M., Xue, B., Deorowicz, S., Rhee, S.Y., and Salzman, J. (**2026**) "A Reference-Free Algorithm Discovers Regulation in the Plant Transcriptome." **Plant Direct** 10, no. 4: e70061. https://doi.org/10.1002/pld3.70061. **BioRXiv** (2024) https://www.biorxiv.org/content/10.1101/2024.05.23.595613v1
13. Robert VanBuren, Annie Nguyen, Rose A. Marks, Catherine Mercado, Anna Pardo, Jeremy Pardo, Jenny Schuster, Brian St. Aubin, Mckena Lipham Wilson, Seung Y. Rhee (**2026**) Variability in drought gene expression datasets highlight the need for community standardization. **Plant Physiology** Volume 200, Issue 1, kiaf653, https://doi.org/10.1093/plphys/kiaf653 **BioRXiv** (2024) 2024.02.04.578814; doi: https://doi.org/10.1101/2024.02.04.578814

14. Theresa Logan-Garbisch, Emily Fryer, Lara Selin Seyah, Lucero Rogel-Hernandez, Seung Y. Rhee, Miriam B. Goodman (**2025**) *C. elegans* Nematodes are Attracted to Microbial Fermentation Products in a Satiety-dependent Manner. **Gene|Genomes|Genetics** *In press.* **BioRXiv** (2025) https://www.biorxiv.org/content/10.1101/2025.02.21.639594v1
15. Karine Prado, Bo Xue, Jennifer E Johnson, Sterling Field, Matt Stata, Charles Lynn Hawkins, Ru-Ching Hsia, Hongbing Liu, Shifeng Cheng, Seung Y. Rhee (**2025**) Photosynthetic acclimation mediates exponential growth of a desert plant in Death Valley summer. **Current Biology** Volume 35, Issue 22, 5502 - 5520.e11 **BioRXiv** (2023) 2023.06.23.546155; doi: https://doi.org/10.1101/2023.06.23.546155
16. Huikyong Cho, Ilyong Choi, Nadia Bouain, Amjad Nawaz, Luqing Zheng, Zaigham Shahzad, Federica Brandizzi, Seung Y Rhee, Hatem Rouached (**2025**) Subcellular Relocation of bGLU25 and GRP7 Delays Flowering in Phosphorus-Limited Environment. **Developmental Cell** *In press.*
17. Zhuolun Wang, Stephanie Cara, Seung Y. Rhee, Bernard Hauser (**2025**) *Tetratricopeptide Repeat 2* Is a Quantitative Trait Locus that Acts Maternally to Control Seed Size and Regulate Carbohydrate Accumulation in *Arabidopsis* Seeds. **International Journal of Molecular Sciences** 26(17), 8310; https://doi.org/10.3390/ijms26178310

18. Evan Saldivar, Sterling Field, Seung Y. Rhee (**2025**) Cellular view of metabolism: metabolic biomolecular condensates. **New Phytologist** http://doi.org/10.1111/nph.70474
19. Kaan Koper, Marcos de Oliveira, Sebastian Hu, Shogo Hataya, Fayaz Soleymani-Babadi, Charles Hawkins, Seung Y. Rhee, Taichi E. Takasuka, Zora Nikoloski, Hiroshi A. Maeda (**2025**) Mapping multi-substrate specificity of aminotransferases in Arabidopsis. **Nature Plants** *In press.*
20. Arnau Sebé-Pedrós, Amos Tanay, Mara Lawniczak, Detlev Arendt, Stein Aerts, John Archibald, Maria Arnone, Mark Blaxter, Phillip Cleves, Susana Coelho, Mafalda Dias, Casey Dunn, Anamaria Elek, Jonathan Frazer, Toni Gabaldon, Jesse Gillis, Xavier Grau-Bové, Roderic Guigó, Oliver Hobert, Jaime Huerta-Cepas, Manuel Irimia, Allon Klein, Harris Lewin, Heather Marlow, Jacob Musser, László Nagy, Sebastian Najle, Lior Pachter, Sadye Paez, Irene Papatheodorou, Michael Passalacqua, Nikolaus Rajewsky, Seung Y. Rhee, Thomas Richards, Lauren M. Saunders, Eve Seuntjens, Jordi Solana, Yuyao Song, Ulrich Technau, Bo Wang (**2025**) The Biodiversity Cell Atlas: mapping the tree of life at cellular resolution **Nature** 645, 877–885. https://doi.org/10.1038/s41586-025-09312-4
21. Karine Prado, Bethany Holland, Brian Gardener, Peter Lundquist, James Santiago, Robert VanBuren, Seung Yon Rhee (**2025**) Building Climate-Resilient Crops: Genetic, Environmental, and Technological Strategies for Heat and Drought Stress Tolerance. **Journal of Experimental Botany** eraf111. https://doi.org/10.1093/jxb/eraf111
22. Bo Xue, Karine Prado, Seung Y. Rhee, Matt Stata (**2025**) UnigeneFinder: An automated pipeline for gene calling from transcriptome assemblies without a reference genome. **Plant Direct** 9(4): e70056 **BioRXiv** (2024) https://www.biorxiv.org/content/10.1101/2024.08.19.608648v1
23. Marks, R.A., Ekwealor, J.T.B., Artur, M.A.S., Bondi, L., Boothby, T.C, Carmo, O.M.S., Centeno, D.C., Coe, K.K., Dace, H.J.W., Hutt, A., Porembski, S., Thalhammer, A., van der Pas, L., Wood, A.J., Alpert, P., Bartels, D., Boeynaems, S., Datar, M.N., Giese, T., Ibrahim Seidou, W., Kirchner, S.M., Köhler, J., Kumara, U.G.V.S.S., Kyung, J., Lyall, R., Mishler, B.D., Ndongmo Vouffo Epse Tsopze, J.B.V.T., Otegui, M.S., Reddy, V., Rexroth, J., Tebele, S.M., VanBuren, R., Verdier, J., Vothknecht, U.C., Wittenberg, M.F., Zokov, E., Oliver, M.J., Rhee, S.Y. (**2025**) Life on the dry side: A roadmap to understanding desiccation tolerance and accelerating translational applications. **Nature Communications 16**(1):3284. doi: 10.1038/s41467-025-58656-y.
24. Charles Hawkins, Farida Yasmin, Bo Xue, Gabrielle Wyatt, Philipp Zerbe, Seung Y. Rhee (**2025**) Plant Metabolic Network 16: expansion of underrepresented plant groups and experimentally supported enzyme data. **Nucleic Acids Research** Jan 6;53(D1):D1606-D1613. doi: 10.1093/nar/gkae991.
25. Seung Y. Rhee, Daniel N. Anstett, Edgar B. Cahoon, Alejandra A. Covarrubias-Robles, Eric Danquah, Natalia Dudareva, Hiroshi Ezura, Kadeem J. Gilbert, Rodrigo A. Gutiérrez, Michelle Heck, David B. Lowry, Ron Mittler, Gloria Muday, Clare Mukankusi, Andrew D.L. Nelson, Silvia Restrepo, Hatem Rouached, Motoaki Seki, Berkley Walker, Danielle Way, and Andreas P.M. Weber (**2025**) Resilience plants, sustainable future. **Trends in Plant Science** 30(4): 382-388. doi: 10.1016/j.tplants.2024.11.001.

26. Fryer E, Guha S, Rogel-Hernandez L, Logan-Garbisch T, Farah HN, Rezaei E, Mollhoff I, Nekimken AL, Xu A, Fechner S, Druckmann S, Clandinin TR, Rhee SY, and Goodman MB (**2024**) A high-throughput behavioral screening platform for measuring chemotaxis by *C. elegans.* **PLOS Biology** Jun 27;22(6):e3002672. doi: 10.1371/journal.pbio.3002672. **BioRXiv** (2023) 2023.06.02.542933; doi: https://doi.org/10.1101/2023.06.02.542933
27. Ginzburg DN, Cox JA, Rhee SY (**2024**) Non-destructive, whole-plant phenotyping reveals dynamic changes in water use efficiency, photosynthesis, and rhizosphere acidification of

sorghum accessions under osmotic stress. **Plant Direct** http://doi.org/10.1002/pld3.571 **BioRXiv** (2023) https://www.biorxiv.org/content/10.1101/2023.09.26.559576v1

28. Cho H, Banf M, Shahzad Z, Bossi F, Ruffel S, Van Leene J, Krouk G, Brandizzi F, De Jaeger G, Lacombe B, Rhee SY, and Rouached H (**2023**) ARSK1 activates TOR signaling to adjust growth to phosphate availability in Arabidopsis **Current Biology** 20:S0960-9822(23)00291-9. PMID: 36963384. https://doi.org/10.1016/j.cub.2023.03.005
29. Field S, Jang G-J, Dean C, Strader L, Rhee SY (**2023**) Plants use molecular mechanisms mediated by biomolecular condensates to integrate environmental cues with development **The Plant Cell** https://doi.org/10.1093/plcell/koad062
30. Zhao K and Rhee SY (**2023**) Enzyme and pathway enrichment analyses using omics data. **Trends in Genetics** https://doi.org/10.1016/j.tig.2023.01.003
31. Ginzburg D and Rhee SY (**2023**) Evaluating drought resistance with a Raspberry Pi and time-lapse photography. **Bio-protocol** 13(2): e4593. DOI: 10.21769/BioProtoc.4593
32. Xue, B., & Rhee, S. Y. (**2023**). Status of genome function annotation in model organisms and crops. **Plant Direct** 7(7), e499. https://doi.org/10.1002/pld3.499 **BioRXiv** (2022) https://biorxiv.org/cgi/content/short/2022.07.03.498619v1

33. Dwyer W, Ibe C, and Rhee SY (**2022**) Renaming Indigenous crops and addressing colonial bias in scientific language. **Trends in Plant Science** 27(12): 1189-1192 https://doi.org/10.1016/j.tplants.2022.08.022
34. Rice S, Lazarus E, Anderton C, Birnbaum K, Brophy J, Cole B, Dickel D, Ehrhardt D, Fahlgren N, Frank M, Haswell E, Huang S-S, Leiboff S, Libault M, Otegui M, Provart N, Uhrig GR, and Rhee SY (**2022**) First Plant Cell Atlas Symposium Report **Plant Direct** 6(6):e406 doi: https://doi.org/10.1002/pld3.406
35. Zhao K, Rhee SY (**2022**) Omics-guided functional discovery of plant metabolic pathways. **Current Opinion in Plant Biology** 67:102222. doi: https://doi.org/10.1016/j.pbi.2022.102222
36. Ginzburg D, Bossi F, and Rhee SY (**2022**) Uncoupling differential water usage from drought resistance in a dwarf Arabidopsis mutant. **Plant Physiology** 190(4):2115–2121 **BioRXiv** (2021) https://www.biorxiv.org/content/10.1101/2021.11.25.470014v1
37. Bossi F, Jin B, Lazarus E, Cartwright H, Dorone Y, Rhee SY (**2022**) *CHIQUITA1* maintains temporal transition between proliferation and differentiation in *Arabidopsis thaliana* **Development** 149(11):dev200565. doi: 10.1242/dev.200565 **BioRXiv** (2021) 2021.11.24.469926; doi: https://doi.org/10.1101/2021.11.24.469926
38. Birnbaum KD, Otegui MS, Bailey-Serres J, Rhee SY (**2022**) The Plant Cell Atlas: Focusing New Technologies on the Kingdom that Nourishes the Planet. **Plant Physiology** 188(2):675–679. doi: 10.1093/plphys/kiab584. Epub ahead of print (2021) PMID: 34935969.

39. Dorone Y, Boeynaems S, Rhee SY (**2021**) Live imaging *Arabidopsis thaliana* embryos under different hydration conditions. **STAR Protocols** 2(4): 101025. https://doi.org/10.1016/j.xpro.2021.101025
40. Nam H-I, Shahzad Z, Dorone Y, Clowez S, Zhao K, Bouain N, Cho H, Rhee SY and Rouached H (**2021**) Interdependent nutrient availability controls photosynthesis through retrograde signaling. **Nature Communications** 12:7211 https://doi.org/10.1038/s41467-021-27548-2 **BioRXiv doi:** https://doi.org/10.1101/2021.02.11.430802
41. Therby-Vale R, Lacombe B, Rhee SY, Nussaume L, Rouached H (**2021**) Mineral Nutrient Signaling Controls Photosynthesis: A focus on iron-deficiency induced chlorosis. **Trends in Plant Science** https://doi.org/10.1016/j.tplants.2021.11.005

42. Silva TN, Thomas JB, Dahlberg J, Rhee SY, Mortimer JC (**2021**) Progress and Challenges in Sorghum Biotechnology, a Multi-Purpose Feedstock for the Bioeconomy. **Journal of Experimental Botany** 73(3): 646–664. https://doi.org/10.1093/jxb/erab450
43. Zhao K, Kong D, Jin B, Smolke CD, Rhee SY (**2021**) A Novel Form of Bivalent Chromatin Associates with Rapid Induction of Camalexin Biosynthesis Genes in Response to a Pathogen Signal in Arabidopsis. **eLife** https://elifesciences.org/articles/69508 **bioRxiv** doi: https://doi.org/10.1101/589036
44. Plant Cell Atlas Consortium, Ghosh Jha S, Borowsky AT, Cole BJ, Fahlgren N, Farmer A, Huang SC, Karia P, Libault M, Provart NJ, Rice SL, Saura-Sanchez M, Agarwal P, Ahkami AH, Anderton CR, Briggs SP, Brophy JAN, Denolf P, Di Costanzo LF, Exposito-Alonso M, Giacomello S, Gomez-Cano F, Kaufmann K, Ko DK, Kumar S, Malkovskiy AV, Nakayama N, Obata T, Otegui MS, Palfalvi G, Quezada-Rodríguez EH, Singh R, Uhrig RG, Waese J, Van Wijk K, Wright RC, Ehrhardt DW, Birnbaum KD, Rhee SY (**2021**) Vision, challenges and opportunities for a Plant Cell Atlas. **eLife** DOI: 10.7554/eLife.66877
45. Hawkins C, Ginzburg D, Zhao K, Dwyer W, Xue B, Xu A, Rice S, Cole B, Paley S, Karp P, and Rhee SY (**2021**) Plant Metabolic Network: A comprehensive resource of plant metabolic information. **Journal of Integrative Plant Biology**. https://doi.org/10.1111/jipb.13163
46. Eckelbarger M, Rice S, Osano A, Peng J, Ullah H, Rhee SY (**2021**) Recognizing Pioneering Black Plant Biologists in Our Schools and Society. **Trends in Plant Science** http://doi.org/10.1016/j.tplants.2021.07.021
47. Cole B, Bergmann D, Blaby-Haas C, Blaby I, Bouchard K, Brady S, Ciobanu D, Coleman-Derr D, Leiboff S, Mortimer J, Nobori T, Rhee SY, Schmutz J, Simmons BA Singh A, Sinha N, Vogel J, O'Malley R, Visel A (**2021**) Plant Single-Cell Solutions for Energy and the Environment. **Communications Biology** 4:962.
48. Dorone Y, Boeynaems S, Jin B, Bossi F, Flores E, Lazarus E, Michiels E, De Decker M, Baatsen P, Holehouse AS, Sukenik S, Gitler AD, Rhee SY (**2021**) Hydration-dependent phase separation of a prion-like protein regulates seed germination during water stress. **Cell** 184(16), 4284-4298.e27 **bioRxiv** 2020.08.07.242172; doi: https://doi.org/10.1101/2020.08.07.242172 [highlighted by Developmental Cell, PNAS, Nature Chemical Biology, F1000, Science]
49. Demirer GS, Silva TN, Thomas JB, Jackson CT, Ehrhardt DW, Rhee SY, Mortimer JC, and Landry MP (**2021**) Nanotechnology to advance CRISPR/Cas genetic engineering of plants. **Nature Nanotechnology** 16, 243–250.

50. Kang S-H, Pandey RP, Lee C-M, Jeong J-T, Choi B-S, Sim JS, Jung M, Won SY, Oh T-J, Yu Y, Lee OK, Kim HH, Lee T-H, Kim N-H, Bashyal P, Kim T-S, Kim C-K, Kim J-S, Ahn B-O, Rhee SY, Sohng JK (**2020**) Genome-enabled discovery of anthraquinone biosynthesis in *Senna tora.* **Nature Communications** 11, 5875. https://doi.org/10.1038/s41467-020-19681-1 **bioRxiv** doi: https://doi.org/10.1101/2020.04.27.063495
51. Rice S, Fryer E, Jha SG, Malkovskiy A, Meyer H, Thomas J, Weizbauer R, Zhao K, Birnbaum KD, Ehrhardt DW, Wang Z, Rhee SY, and The Plant Cell Atlas Consortium (**2020**) First Plant Cell Atlas Workshop Report. **Plant Direct** 00: 1– 10. https://doi.org/10.1002/pld3.271
52. Parry G, Provart NJ, Brady SM, Uzilday B, The Multinational Arabidopsis Steering Committee (**2020**) Current status of the multinational Arabidopsis community. **Plant Direct** 00:1-9.
53. Lin F, Lazarus E, Rhee SY (**2020**) QTG-Finder2: a generalized machine learning algorithm for prioritizing QTL causal genes in plants. **Genes|Genomes|Genetics** 10(7): 2411–2421. **bioRxiv** doi: https://doi.org/10.1101/2020.02.03.931444

54. Bouain N, Korte A, Satbhai SB, Rhee SY, Busch W, Rouached H (**2019**) Systems approaches provide new insights into *Arabidopsis thaliana* root growth under mineral nutrient limitation. **PLOS Genetics** 6;15(11):e1008392. **bioRxiv** 460360; doi: https://doi.org/10.1101/460360
55. Rhee SY, Birnbaum KD, Ehrhardt DW (**2019**) Towards Building a Plant Cell Atlas. **Trends in Plant Science** 24(4):303-310
56. Banf M, Zhao K, Rhee SY (**2019**) METACLUSTER - an R package for context-specific functionality analysis of metabolic gene clusters. **Bioinformatics** btz021, https://doi.org/10.1093/bioinformatics/btz021

57. Lin F, Fan J, Rhee SY (**2018**) QTG-Finder: a machine-learning algorithm to prioritize causal genes of quantitative trait loci in plants. **Genes|Genomes|Genetics** 9(10):3129-3138. **bioRxiv** doi: https://doi.org/10.1101/484204

58. Friesner J, Assmann SM, Bastow R, Bailey-Serres J, Beynon J, Brendel V, Buell CR, Bucksch A, Busch W, Demura T, Dinneny JR, Doherty CJ, Eveland AL, Falter-Braun P, Gehan MA, Gonzales M, Grotewold E, Gutierrez R, Kramer U, Krouk G, Ma S, Markelz RJC, Megraw M, Meyers BC, Murray JAH, Provart NJ, Rhee SY, Smith R, Spalding EP, Taylor C, Teal TK, Torii KU, Town C, Vaughn M, Vierstra R, Ware D, Wilkins O, Williams C, Brady SM (**2017**) The Next Generation of Training for Arabidopsis Researchers: Bioinformatics and Quantitative Biology. **Plant Physiology** 175(4):1499-1509. doi: 10.1104/pp.17.01490. PubMed PMID: 29208732; PubMed Central PMCID: PMC5717721.
59. Bossi F, Fan J, Xiao J, Chandra L, Shen M, Dorone Y, Wagner D, Rhee SY (**2017**) Systematic discovery of novel eukaryotic transcriptional regulators using sequence homology independent prediction. **BMC Genomics** 18(1):480
60. Rouached H and Rhee SY (**2017**) System-level understanding of plant mineral nutrition in the big data era. **Current Opinion in Systems Biology** 4:71-77
61. Schalpfer P, Zhang P, Chuan W, Kim T, Banf M, Chae L, Dreher K, Arvind C, Nilo-Poyanco R, Bernard T, Kahn D, and Rhee SY (**2017**) Genome-wide prediction of metabolic enzymes, pathways, and gene clusters in plants. **Plant Physiology** 173(4):2041-2059
62. Chavali A and Rhee SY (**2017**) Bioinformatics tools for the identification of gene clusters that biosynthesize specialized metabolites. **Briefings in Bioinformatics** bbx020. doi: 10.1093/bib/bbx020
63. Banf M and Rhee SY (**2017**) Enhancing gene regulatory network inference through data integration with markov random fields. **Nature Scientific Reports** 7:41174.

64. Banf M and Rhee SY (**2016**) Computational inference of gene regulatory networks: approaches, limitations and opportunities. **BBA Gene Regulatory Mechanisms** S1874-9399(16)30188-2.
65. Walsh JR, Schaeffer ML, Zhang, Rhee SY, Dickerson JA, Sen TZ (**2016**) The quality of metabolic pathway resources depends on initial enzymatic function assignments: a case for maize. **BMC Systems Biology** 10:129.
66. Zheng Y, Jiao C, Sun H, Rosli HG, Pombo MA, Zhang P, Banf M, Dai X, Martin GB, Giovannoni JJ, Zhao PX, Rhee SY, Fei Z (**2016**) iTAK: a program for genome-wide prediction and classification of plant transcription factors, transcriptional regulators, and protein kinases. **Molecular Plant** S1674-2052(16)30223-4.
67. Rhee SY, Parker J, and Mockler T (**2016**) A glimpse into the future of genome-enabled plant biology from the shores of Cold Spring Harbor. **Genome Biology** 17(1):3.

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OTHER PUBLICATIONS

148. BERAC (2022) U.S. Scientific Leadership Addressing Energy, Ecosystems, Climate, and Sustainable Prosperity: Report from the BERAC Subcommittee on International Benchmarking, DOE/SC-0208. M. McCann and P. Reed, eds. **Biological and Environmental Research Advisory Committee**. DOI:10.2172/1895129.
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Patents

Title: PLANTS WITH IMPROVED PHOSPHORUS USE EFFICIENCY
MSUT Ref: TEC2021-0120
US Serial No. 63/362,155
MVS Ref: P13702US00
Filed: 03/30/2022
Inventors: Hatem Rouached, Seung Y. Rhee

Title: Modulation of Iron- and Phosphate-Dependent Chlorophyll Accumulations
U.S. Provisional Application No. 63/143,366
Filing Date: January 29, 2021
Your Ref: 5135
KT Ref: 107321-1219474-000100US

Inventors: Hatem Rouached, Seung Yon Rhee.

Title: FLOE1-MEDIATED MODULATION OF SEED LONGEVITY AND GERMINATION RATES
U.S. Provisional Patent Application No. 63/063,009
Filed: August 7, 2020
Stanford Ref.: S20-324
Carnegie Ref.: 5133
KTS Ref.: 079445-1204833-006800US
Inventors: Yanniv Dorone, Steven Boeynaems, Aaron D. Gitler, Seung Yon Rhee

Research Funding

Cumulative to Carnegie: $46,533,280
Cumulative to MSU: $20,983,134
Cumulative Total: $173,853,974

Active Research Grants

Title: Global Centers: International Research Center for Enhancing Plant Resilience
Funding Organization: NSF OISE: 2434687
Dates of Project: 1/1/2025 - 12/31/2029
Award Amount: $5,000,000 Total to all five countries: $16,042,000.00
PI: Sue Rhee

Title: TRTech-PGR: Establishing a one-stop-shop for plant metabolism annotations and launching a plant enzyme function consortium
Funding Organization: NSF IOS: 2312181
Dates of Project: 10/1/2023 - 9/31/2027
Award Amount: $2,999,526
PI: Sue Rhee

Title: BII: Life without water: Protecting macromolecules, cells, and organisms during desiccation and rehydration across kingdoms of life
Funding Organization: NSF BII: 2213983
Dates of Project: 8/1/2022 - 7/31/2027
Award Amount: $12,500,000
PI: Sue Rhee

Title: Integrated engineering of whole plant water use efficiency in Sorghum and Setaria
Funding Organization: DOE Baxter *(11076)*
Dates of Project: 9/1/2022 - 8/31/2027
Total Award Amount: $16,000,000 Individual Subaward Amount: $1,940,908
PI: Ivan Baxter

Title: Creating and Fostering the Plant Cell Atlas Community
Funding Organization: NSF RCN *(11002)*
Dates of Project: 06/1/2021 -- 05/31/2026
Award Amount: $765,382
PI: Sue Rhee

Title: Interrogating pennycress natural and induced variation to improve abiotic stress tolerance and oilseed bioenergy crop resilience
Funding Organization: Illinois State (DOE): DE-FOA-0002214
Dates of Project: 09/01/20 – 09/14/26
Total Award Amount: $12,899,996 Individual Subaward Amount: $2,429,132
PI: John Sedbrook

Completed Research Grants

Title: High-throughput determination of a subcellular metabolic network map of plants
Funding Organization: DOE BER *(10931)*
Dates of Project: 09/15/2019 -- 09/14/2023
Award Amount: $2,311,477
PI: Sue Rhee

Title: NeuroPlant PHASE 2: Leveraging a botanical armamentarium to manipulate the brain
Funding Organization: Stanford (11051)
Dates of Project: 01/01/22 – 12/31/23
Total Award Amount: $400,000 Individual Subaward Amount: $169,740
PI: Miriam Goodman

Title: 1st Workshop on the Plant Cell Atlas Initiative
Funding Organization: NSF *(10913)*
Dates of Project: 06/01/2019 -- 05/31/2023
Award Amount: $82,861
PI: Sue Rhee

Title: Using Systems Approaches to Improve Photosynthesis and Water Use Efficiency in Sorghum
Funding Organization: Danforth (DOE DE-SC0018277). Subaward #: 23021-C (*10797)*
Dates of Project: 09/15/2017 – 09/14/2023
Total Award Amount: $16,067,709 Individual Subaward Amount: $1,866,443
PI: Ivan Baxter

Title: TOOLS-PGR: Computational Infrastructure to Enable High-throughput, High-quality Annotations of Compartmentalized Metabolic Networks for Plant Genomes
Funding Organization: NSF: IOS-1546838 *(10708)*
Dates of Project: 08/15/16 – 07/31/22
Award Amount: $2,193,335
PI: Sue Rhee

Title: NeuroPlant: Leveraging a botanical armamentarium to manipulate the brain (10897)
Funding Organization: Stanford: # 62019381 - 140753
Dates of Project: 01/01/19 – 12/31/21
Total Award Amount: $700,000 **Individual Subaward Amount:** $208,000
PI: Miriam Goodman

Title: Deciphering Life Functions in Extreme Environment
Funding Organization: Venture Grant / Broccoli Charitable Fund. *(10877)*
Dates of Project: 10/01/18 – 09/30/21
Award Amount: $60,000

PI: Sue Rhee

Title: BASF Participation in the Plant Cell Atlas Initiative
Funding Organization: BASF (BBCC Innovation Center, Belgium) *(10952)*
Dates of Project: 02/14/20 – 02/13/21
Award Amount: $10,000
PI: Sue Rhee

Title: Thermo-adaptation of photosynthesis in extremophilic desert plants
Funding Organization: Carnegie *(10908)*
Dates of Project: 06/01/2019 -- 5/31/2021
Award Amount: $150,000
PI: Sue Rhee

Title: Prediction and Discovery of Host Metabolites and Metabolic Pathways Required for Proliferation of an Obligate Fungal Biotroph
Funding Organization: UC Berkeley (NSF): MCB-1617020. Subaward #: 00009338 *(10722)*
Dates of Project: 09/15/2016 – 08/31/2020
Total Award Amount: $1,891,482 **Individual Subaward Amount:** $417,893
PI: Mary Wildermuth

Title: Discovery of new molecular pathways for regulating phosphate content in Arabidopsis thaliana and *Vitis vinifera* for sustainable food production
Funding Organization: Fondation de France *(10649)*
Dates of Project: 09/08/2015 – 09/07/2020
Award Amount: $30,000
PI: Sue Rhee

Title: An Integrated Pipeline for Accelerated Plan Natural Product Discovery *(10643)*
Funding Organization: Stanford (NIH): 3U01GM110699-02S1. Subaward #: 61066255-112225
Dates of Project: 08/15/2015 – 04/30/2020
Total Award Amount: $4,491,520.00 **Individual Subaward Amount:** $924,810
PI: Christina Smolke

Title: A systems-level analysis of drought and density response in the model c4 grass *Setaria viridis*
Funding Organization: Danforth (DOE): DE-SC0008769; 23009-CI *(10412)*
Dates of Project: 09/01/2012 – 08/31/2018
Total Award Amount: $12,138,927 **Individual Subaward Amount:** $2,212,640
PI: Thomas Brutnell

Title: The membrane-based protein Interactome
Funding Organization: NSF: MCB-1052348 *(10274)*
Dates of Project: 04/15/2011 – 03/31/2016
Award Amount: $1,834,556
PI: Wolf Frommer

Title: Systematic identification of regulators of transcription factors using computational predictions and high-throughput yeast-one-hybrid assays

Funding Organization: Association of Independent Plant Research Institutes (AIPI) *(10383)*
Dates of Project: 07/01/2012 – 06/30/2015
Award Amount: $14,400
PI: Sue Rhee

Title: AIPI Plant Genome Annotation Group
Funding Organization: Association of Independent Plant Research Institutes (AIPI) *(10534)*
Dates of Project: 03/11/2014 – 02/28/2015
Award Amount: $25,000
PI: Sue Rhee

Title: *Arabidopsis* 2010: Towards a Comprehensive *Arabidopsis* Protein Interactome Map: Systems Biology of the Membrane Proteins and Signalosome
Funding Organization: NSF: MCB-0618402 (2066)
Dates of Project: 09/01/2006 – 08/31/2011
Award Amount: $4,799,186
PI: Wolf Frommer

Title: Building a Network of Plant Metabolic Pathway Databases and Communities
Funding Organization: NSF: DBI-0640769 (2098)
Dates of Project: 03/15/2008 – 02/28/2013
Award Amount: $1,477,869
PI: Sue Rhee

Title: Metabolomics: A Functional Genomics Tool for Deciphering Functions of *Arabidopsis* Genes in the Context of Metabolic and Regulatory Networks
Funding Organization: Iowa State University (NSF): 420-40-71A (10079)
Dates of Project: 03/01/2009 – 02/28/2013
Total Award Amount: $2,925,398 **Individual Subaward Amount:** $269,862
PI: Basil Nikolau

Title: TAIR: The *Arabidopsis* Information Resource
Funding Organization: NSF: DBI-0850219 (10107)
Dates of Project: 09/01/2009 – 08/31/2014
Award Amount: $4,170,595
PI: Eva Huala

Title: TRPGR: Building a Highly Automated Metabolic Pathway Reconstruction Infrastructure for Plants
Funding Organization: NSF: IOS-1026003 (10204)
Dates of Project: 09/01/2010 – 08/31/2016
Award Amount: $1,825,569
PI: Sue Rhee

Title: The First International Biocurator Meeting
Funding Organization: Genetics Society of America (5133)
Dates of Project: 5/22/2005 – 12/01/2008
Award Amount: $25,000
PI: Sue Rhee

Title: Enhancing the Quality and Quantity of *Arabidopsis* Metabolism Data in AraCyc and MetaCyc
Funding Organization: Pioneer Hi-Breed International (5119)
Dates of Project: 02/18/2005 – 08/06/2006
Award Amount: $40,000
PI: Sue Rhee

Title: 2nd International Biocurator Meeting
Funding Organization: Villa Bosch (5134)
Dates of Project: 02/13/2007 – 02/12/2008
Award Amount: $24,968
PI: Sue Rhee

Title: TAIR: The *Arabidopsis* Information Resource
Funding Organization: NSF: DBI-0417062 (2462)
Dates of Project: 09/01/2004 – 08/31/2009
Award Amount: $7,988,952
PI: Sue Rhee

Title: *Arabidopsis* 2010: Metabolomics: A Functional Genomics Tool for Deciphering Functions of *Arabidopsis* Genes in the Context of Metabolic and Regulatory Networks
Funding Organization: Iowa State Univ. (NSF): 420-40-17 (4306)
Dates of Project: 09/01/2005 – 08/31/2008
Total Award Amount: $1,000,000 **Individual Subaward Amount:** $64,875
PI: Basil Nikolau

Title: Low Temperature Regulatory Circuits and Gene Regulation in Higher Plants
Funding Organization: MSU (NSF): DBI-0110124 (4433)
Dates of Project: 09/01/2001 – 08/31/2008
Total Award Amount: $5,591,234 **Individual Subaward Amount:** $539,021
PI: Michael F. Thomashow

Title: First International Biocurator Meeting
Funding Organization: NSF: DBI-0551286 (2282)
Dates of Project: 01/01/2006 – 12/31/2007
Award Amount: $29,810
PI: Sue Rhee

Title: The Plant Ontology Consortium
Funding Organization: CSHL (NSF): 22130313 (4417)
Dates of Project: 09/01/2003 – 08/31/2007
Total Award Amount: $1,672,411 **Individual Subaward Amount:** $530,928
PI: Lincoln Stein

Title: The MetaCyc Metabolic Pathway Database
Funding Organization: SRI (NIH): 55-000650 (4441)
Dates of Project: 03/01/2004 – 02/28/2007
Total Award Amount: $3,337305 **Individual Subaward Amount:** $839,512
PI: Peter Karp

Title: Gene Ontology Consortium
Funding Organization: The Jackson Laboratory (NIH): 2P41HG002273-04 (4442)
Dates of Project: 03/09/2004 – 02/28/2007
Total Award Amount: $12,396,096 **Individual Subaward Amount:** $634,431
PI: Judith Blake

Title: First International Biocurator Meeting
Funding Organization: NIH: 1R13HG004030-01 (1403)
Dates of Project: 12/07/2005 – 11/30/2006
Award Amount: $12,000
PI: Sue Rhee

Title: The Arabidopsis Biological Resource Center at The Ohio State University
Funding Organization: OSURF (NSF): DBI-0091471 (4428)
Dates of Project: 02/01/2001 – 02/28/2006
Total Award Amount: $2,123,500 **Individual Subaward Amount:** $402,983
PI: Randy Scholl

Title: AtIR: An *Arabidopsis* Thaliana Information Resource
Funding Organization: NSF: DBI-9978564 (2665)
Dates of Project: 10/01/1999 – 09/30/2005
Award Amount: **$**5,728,633
PI: Chris Somerville

Title: A Literature Curation Tool for Organism Databases
Funding Organization: NIH: 1R01HG02728-01 (1092)
Dates of Project: 09/30/2002 – 08/31/2005
Award Amount: $896,386
PI: Sue Rhee

Title: Large-scale Fluorescent Tagging of Full-length Genes to Characterize Native Expression Patterns and Subcellular Targeting of *Arabidopsis* Proteins of Unknown Function
Funding Organization: SUNY at Stony Brook (NSF): 1027553 (4413)
Dates of Project: 09/01/2002 – 12/31/2004
Total Award Amount: $1,580,000 **Individual Subaward Amount:** $168,497
PI: Vitaly Citovsky

Title: Partnership for Research & Education in Plants
Funding Organization: Virginia Tech (NIH): CR-19501-431399 (4402)
Dates of Project: 09/30/2003 – 08/31/2004
Total Award Amount: $249,302 **Individual Subaward Amount:** $27,522
PI: Erin L. Dolan

Title: Gene Ontology Consortium
Funding Organization: The Jackson Laboratory (NIH) (4435)
Dates of Project: 01/01/2002 – 03/08/2004
Total Award Amount: $5,784,994 **Individual Subaward Amount:** $536,045
PI: Judith Blake

Title: Development of the MetaCyc Metabolic Pathway Database
Funding Organization: SRI (NIH): P11833 (4437)

Dates of Project: 03/01/2002 – 02/28/2004
Total Award Amount: $1,842,466 **Individual Subaward Amount:** $238,999
PI: Peter Karp

Title: Sequencing of *Arabidopsis* Chromosome II and Beyond, and Development of Resources for *Arabidopsis* Genome Analysis
Funding Organization: TIGR (NSF): TIGR-00-007 (4432)
Dates of Project: 05/01/2001 – 12/31/2001
Total Award Amount: $15,806,875 **Individual Subaward Amount:** $105,824
PI: Claire Fraser

Teaching

Courses developed and taught

Fundamentals and Frontiers in Plant Biology (Stanford BIO129/229) (2020, 2022)
Career Exploration & Planning (Stanford BIO380) (2019)
Carnegie Writing Workshop (2018, 2019)
Networks in Biology (Stanford Freshman Seminar) (2010, 2012)

Guest lectures and panels

2025

2025 Spring Semester Michigan State University Sustainable Agriculture and Food Systems (SAFS) Spring Seminar Series (Jan 31, 2025)

2024

“Best Practices for Scientific Writing”, Plant Resilience Institute Networking Hour (Sept 12, 2024)
“Grant and Fellowship Proposal Tips”, Proposal and Technical Writing Workshop (Aug 6, 2024)
“Panel discussion: Careers in plant science”, New Phytologist Next Generation Scientists (June 7, 2024)

Outreach

Glencairn Science Night (2024, 2025)
MSU Science Festival (2024, 2025)
San Francisco Dept of Children, Youth and their Families Summer Camp Program –Tardigrade Hunting (2022-present)
Science on the Screen (2021-2023)
Plant Science and Art Exhibit (2021-present)
Plant Science Lesson Plans for Middle School (2021)
Popular Science Essays (2018-present)
Chemical Ecology Journal Club with Faulty, Students, and Local Citizens (2015-2019)

People Trained (192)

PhD Students

	First Name	Last Name	Title	Start	End	Present Position
192	Ryan	Brenner	PhD student	12/25	-	
191	Aidan	Deneed	PhD student	12/25	-	
180	Erin	Cushing	PhD student	3/25	-	
177	Briana	Hashim	PhD student	1/25	-	
175	Chloe	Grabb	PhD student	9/24	-	
144	Evan	Saldivar	PhD student	6/21	-	
105	Yanniv	Dorone	Postdoc PhD student	1/21 9/15	12/21 12/20	Senior Investment Associate - Fall Line Capital

Masters Students

	First Name	Last Name	Title	Start	End	Present Position
158	Elena	del Pup	Masters student	7/22	1/23	PhD candidate, Wageningen University & Research
151	Maxine	Gutierrez	MS student Summer Intern	9/22 4/22	1/24 8/22	Unknown

Undergraduate Students

	First Name	Last Name	Title	Start	End	Present Position
193	Natalie	Pitts	Intern	1/26	-	
187	Elena	Elias	Intern	8/25	-	
186	Arianna	Ruizmal	Summer intern	5/25	8/25	
185	Rylee	Stocks	Summer intern	5/25	8/25	
173	Erika (Peyton)	Vanada	Summer intern	5/24	8/24	Undergrad at Meredith College
172	Isaiah	Kam	Summer intern	5/24	8/24	Undergrad at Middle Tennessee State University
169	Dakarai	Young	Intern	2/24	8/24	Undergrad at MSU
168	Elisha	Vil	Intern	2/24	1/25	Unknown
167	Arianna	Fobbs	Intern	10/23	8/24	Undergrad at MSU
166	A. (Kap)	Kapoor	Intern	10/23	8/24	Undergrad at MSU
164	Aidan	Kile	Intern	8/23	-	Undergrad at MSU
135	Hodan	Farah	Intern	3/20	6/20	Undergrad at Stanford
155	Ruby	Tebbutt	Summer Intern	6/22	8/22	Sustainability Consultant, Turner and Townsend
154	Sandeep	Mangat	Summer Intern	6/22	8/22	Princeton Undergrad
152	Julia	Gershon	Intern	3/22	-	Undergrad at Stanford
150	Nicole	Theberath	Intern	3/22	5/22	Undergrad at Stanford
149	Lara	Seyahi	Intern	3/22	5/22	Undergrad at Stanford
148	Jacob	Dunlop	Intern	3/22	5/22	Undergrad at Stanford
147	Ryan	Vu	Intern	1/22	3/22	Undergrad at Stanford

146	Daniella	Morales	Intern	1/22	3/22	Undergrad at Stanford
133	David	Huang	Summer Intern	6/19	8/19	Unknown
132	Suzie	Lee	Summer Intern	6/19	8/19	Clinical Lab Scientist Intern, Stanford U
123	Ankush	Bharadwaj	Summer Intern	6/18	8/18	Unknown
122	Bharti	Parihar	Summer Intern	6/18	8/18	Laboratory Operations Manager/Technician, Green Biome Institute
121	Lyn	Vakulenko	Summer Intern	5/18	8/18	MS, Digitization Project Officer, Canadian Museum of Nature
115	Sam	Craig	Summer Intern	6/16	8/16	PhD candidate, University of Wisconsin-Madison
114	Elena	Estrada	Summer Intern	6/16	8/16	MS, Staff Product Marketing Manager, Illumina
113	Nikhil	Kaimal	Summer Intern Summer Intern	6/17 6/16	8/17 8/16	MS, PhD candidate, UC Irvine
109	Dylan	Koh	Summer Intern	6/15	8/15	Unknown
108	Vivek	Sriram	Summer Intern	6/15	8/15	PhD, Data Scientist, Translational Analytics and Informatics, Fred Hutch Cancer Center
107	JeanAe	Kim	Intern	6/15	1/16	PhD, UC Riverside
106	Luong	Mai	Intern	6/15	12/15	Unknown
102	Jenny	Guarino	Summer Intern	5/14	8/14	MPP candidate, UC Berkeley's Goldman School of Public Policy
99	Catherine	Doyle	Summer Intern	6/13	8/13	PhD, PMP, Digitalization Specialist, BASF
97	Lessley	Peterson	Intern	1/13	10/13	Unknown
94	Lan	Jiang	Intern	10/12	2/13	Unknown
93	Lilyana	Chandra	Summer Intern	6/12	12/12	QA Analyst, American Medical Systems
92	Varun	Dwaraka	Summer Intern	7/12	9/12	PhD, Head of Bioinformatics, TruDiagnostic, Faculty, Geneva College of Longevity Science
91	Mohan	Avula	Summer Intern	6/12	8/12	Unknown
86	Tam	Tran	Intern	11/11	8/12	MD, Optometrist, Illinois College of Optometry
85	Damian	Priamurskiy	Intern	6/11	3/12	Project Management & Delivery Specialist, Lowenstein Sandler LLP
81	Niek	deKlein	Intern	9/10	1/11	PhD, Senior Bioinformatician, Neogene Therapeutics

80	Kris	Sankaran	Intern	9/10	4/11	PhD, Assistant Professor, University of Wisconsin-Madison
79	Julian	Huang	Summer Intern	6/10	12/10	MD, MBA, Internal Medicine Resident, Brigham & Women's Hospital
78	Nathaniel	Leu	Summer Intern	6/10	9/10	MS, MD, Physician, Alameda Health System
77	Kim	Pham	Summer Intern	6/10	12/10	MD, Palliative Medicine Fellow, University of Arizona College of Medicine
75	Rupa	Paduchuri	Intern	10/09	12/11	MS, Principal Scientific Researcher, Genentech
74	Jon	Iloreta	Summer Intern	6/09	12/10	Unknown
72	Cherise	Lau	Summer Intern Summer Intern	7/10 6/09	9/10 8/09	MS, Associate Software Engineer, Moody's Analytics
71	Vibhu	Bakshi	Intern	3/09	6/09	MS, PhD, Business Immigration Consultant, Fragomen
70	Pranjali	Karia	Intern	3/09	11/09	Unknown
66	Ricardo	Leitão	Summer Intern	7/08	1/09	MS, PhD, Principal Scientific Researcher, Genentech
65	Michael	Ahn	Summer Intern	7/08 8/09	8/08 8/09	MS, Landscape Designer, Marders
59	Joy	Zhang	Summer Intern	6/07	8/07	MS, Staff Software Engineer, Waymo
57	Adeline	Wong	Summer Intern	4/07	9/07	Software Engineer III, Waymo
46	John	McGee	Summer Intern	6/06	8/06	PhD, Senior Vice President, FogPharma
38	Ryan	Pham	Summer Intern	6/05	8/05	MS, Software Developer, IBM
30	Renee	Halbrook	Summer Intern	6/04	8/04	Mom
25	Thomas	Yan	Intern	7/03	6/06	MS, Senior Software Engineer, Unity
11	Holly	Nottage	Intern	2/01	7/01	Unknown
10	Jill	Larimore	Intern	1/01	4/02	PhD, Professor, Los Medanos College
7	Anell	Bengt	Visiting student	9/00	12/01	Freelance Consultant, Nordic Healthcare
6	Smita	Mitra	Visiting student	8/00	10/00	Director, Global Medical Data Science at Janssen
5	Debika	Bhattacharyya	Summer Intern	7/00	8/00	Unknown

Postdoctoral Fellows

	First Name	Last Name	Title	Start	End	Present Position
188	Katherine	Rivera-Zuluaga	Postdoc	7/25	-	
184	Barno	Rezaeva	Postdoc	5/25	-	
162	Bethany	Holland	Postdoc	6/23	-	
161	Danielle	Hoffmann	Postdoc	4/23	-	
156	Matt	Stata	Postdoc	7/22	-	
153	Joanna	Feehan	PRI postdoc fellow Postdoc	3/24 5/22	- 3/24	
145	Sterling	Field	Lab manager Postdoc	7/23 9/21	12/24 6/23	Exec. Admin Assistant, BASF
141	Megan	Ruffley	Postdoc	8/20	6/24	Plant Molecular Breeder, Symplot, Boyse, ID
136	Jason	Thomas	Postdoc	3/20	4/23	CEO, The Pennycress Company
130	Navadeep	Boruah	Postdoc	10/18	7/21	Data Scientist, Bayer Corp
129	Karine	Prado	Senior Research Associate Postdoc	11/21 10/18	- 10/21	Senior Research Associate, Carnegie Science
128	Cheng	Zhao	Postdoc	8/18	8/21	Principal Investigator, Agricultural Genomics Institute at Shenzhen, CAS
126	Nienke	Besbrugge	Postdoc	8/18	4/19	Senior Consultant, Capgemini Invent
119	Jiun	Yen	Postdoc	10/17	10/19	Computational Biologist at BrightSeed, Inc.
118	Fan	Lin	Postdoc	9/17	2/20	Bioinformatician at Brightseed, Inc.
117	Kangmei	Zhao	Postdoc	7/16	10/23	Senior computational scientist, GreenLight Biosciences
111	Arvind	Chavali	Postdoc	1/16	3/18	Strategy consultant, ZS Associates
104	Pascal	Schläpfer	Postdoc	8/14	12/17	Senior Assistant, ETH
100	Michael	Banf	Postdoc	1/14	2/17	Head of Data Science and Algorithm Development, fabforce GmbHs
98	Jue	Fan	Postdoc	5/13	3/15	VP of Bioinformatics, Singleron Biotechnologies
95	Chuan	Wang	Postdoc	10/12	2/16	Senior Bioinformatics Scientist, Brightseed
90	Jim	Guo	Postdoc	7/12	3/15	Staff Scientist, Bioinformatics at the Clinical NGS group at Thermo Fisher

89	Ricardo	Nilo Poyanco	Postdoc	3/12	5/14	Lecturer at School of Biotechnology, Faculty of Science, U. Mayor, Chile
88	Meng	Xu	Postdoc	11/11	8/14	Director of Bioinformatics, Brightseed
87	Taehyong	Kim	Postdoc	3/11	7/15	Principal bioinformatician, Institute for Biomedical Informatics, University of Pennsylvania
83	Flavia	Bossi	Senior Research Associate Postdoc Senior Research Assistant	3/18 2/10 10/09	- 2/18 1/10	
76	Chang	You	Postdoc	8/09	5/11	eCommerce Senior Data Engineer, PepsiCo
73	Purva	Karia	Postdoc Intern Summer Intern Intern	6/21 1/11 6/09	- 6/11 7/09	MS, PhD, Postdoc, Carnegie Institution for Science
67	Lee	Chae	Postdoc	7/08	5/14	Cofounder and CTO, Brightseed
62	Kun	He	Postdoc	9/07	12/09	Head of Data Systems, Bayer Crop Science
61	Ozgur	Ozturk	Postdoc	8/07	3/08	Adjunct Faculty at U. Maryland
58	Liping	Ji	Postdoc	5/07	5/08	Associate prof, Harbin Inst. Tech.
51	Jin	Chen	Postdoc	12/06	8/09	Associate prof, U. Kentucky
43	Tom	Walk	Postdoc	1/06	9/07	Large Plant Breeding Database Manager, North Dakoda State U.
37	Dan	MacLean	Postdoc	5/05	6/06	Head of Bioinformatics, Sainsbury labs, UK
23	Shijun	Li	Postdoc	10/02	10/05	Senior Software Testing Engineer, ThermoFisher
22	Yigong	Lou	Postdoc	9/02	10/04	Bioinformatics analyst, LBL
13	Mark	Lambrecht	Postdoc	4/01	2/02	Director of the Health and Life Sciences Global Practice at SAS

Visiting Scholars

	First Name	Last Name	Title	Start	End	Present Position

190	Kwangchul	Shin	Research associate	9/25	12/25	
189	Shogo	Kuwayama	Grad student	9/25	12/25	
116	Hatem	Rouached	Assistant Professor	2016	2018	Assistant Professor, MSU
103	In-Seob	Han	Professor	2014	2015	U Ulsan, Korea
96	Bernie	Hauser	Professor	2013	2014	U Florida at Gainesville, USA
41	Natasha	Raikhel	Professor	2006	2006	Retired

Research Assistants

	First Name	Last Name	Title	Start	End	Present Position
182	Katie	Philipps	RA	4/25	-	
174	Andrew	Scheil	RA	7/24	8/25	Histology technician, MSU Vet School
163	Jacob	Gantz	RA	8/23	-	
159	Ava	Kloss-Schmidt	RA	8/22	6/24	PhD candidate, NYU
157	Jack	Cox	RA	7/22	5/23	Unknown
143	Maxwell	Eckelbarger	RA Intern	6/21 10/20	12/22 5/21	Undergrad at Stanford
142	Olivia	MacDonald	RA	9/20	3/22	Assistant Program Manager, Thermo Fisher
140	Will	Dwyer	RA	6/20	6/23	PhD candidate, Stanford U
138	Danny	Ginzburg	RA	4/20	8/22	PhD candidate, U. Cambridge, UK
137	Justin	Krupp	RA	3/20	8/21	RA, Takahashi Lab, UT Southwestern
131	Emily	Fryer	RA	3/19	1/23	RA II at Stanford U
124	Kevin	Radja	RA	6/18	6/20	PhD program at Virginia Tech
120	Benjamin	Jin	RA	11/17	7/20	PhD program at UC Santa Barbara
112	JeaneAe	Kim	RA	2/16	7/17	PhD candidate, UC Riverside
101	Phong	Nguyen	RA Summer Intern	9/14 5/14	5/15 8/14	Developer, Parallax Volatility Advisers, LP
84	Caryn	Johansen	RA Summer Intern Summer Intern	10/12 7/12 6/11	7/14 9/12 9/11	MS, Senior Data Scientist, Discord
82	Hye-In	Nam	RA	1/10	5/19	Data Analyst, AXBIO

69	Azam	Noorani Vatani	RA	12/08	8/09	Associate Scientist, Cepheid
68	Sagaya	Arokiasamy	RA	10/08	12/08	Unknown
60	Bindu	Ambaru	RA	7/07	4/10	Scientist, Institute of Bioinformatics and Applied Biotechnology
42	Noah	Whitman	RA	1/06	4/07	Senior Data Scientist, Open City Labs, Inc

Biocurators

	First Name	Last Name	Title	Start	End	Present Position
139	Selena	Rice	Biocurator	4/20	4/24	Unknown
127	Charles	Hawkins	Biocurator	8/18	-	
125	Angela	Xu	Curator Assistant	6/18	3/20	PhD program at Johns Hopkins U
63	AS	Karthikyan	Curator	1/08	11/09	Unknown
56	Suzanne	Fleshman	Curator Assistant	11/07	2/08	Office Administrator, Edward Jones
55	Kate	Dreher	Curator	11/07	11/13	Germplasm coordinator, CYMMIT
50	Phillipe	Lamesch	Curator	12/06	3/12	Head of Fundraising, U. Luxembourg
49	Vanessa	Swing	Webmaster Curator Assistant	3/07 10/06	11/09 3/07	Horticultural Consultant
48	Donghui	Li	Curator	7/06	6/14	Technical Program Manager, Chan Zuckerberg Initiative
39	David	Swarbreck	Curator	10/05	9/10	Group leader, Genome Analysis Team, The Genome Analysis Centre, UK
35	Christophe	Tissier	Curator	1/05	9/07	Project manager, CAVILAM
34	Hartmut	Foerster	Curator	8/04	8/07	Research Associate at Boyce Thompson Institute, Cornell
31	Aleksey	Kleytman	Curator Assistant	2/5	6/6	Senior Reliability Engineer, Akamai Technologies
28	Katica	Ilic	Curator	1/04	10/06	Senior scientist, Fluidigm Corporation
26	Brandon	Zoeckler	Curator Assistant	8/03	3/6	Research technician, UC Berkeley
21	Nick	Moseyko	Curator	9/02	10/05	Director of DevOps, Direct Commerce
20	Gabriel	Lander	Curator Assistant	8/02	3/03	Professor, Scripps Institute

19	Peifen	Zhang	Curator	4/02	7/18	Project Scientist, Phoenix Bioinformatics
18	Suparna	Mundodi	Curator	3/02	5/06	Director, Clinical Mass Spectrometry at Agilent Technologies
17	Tanya	Berardini	Curator	1/02	6/14	Chief Scientific Officer, Phoenix Bioinformatics
9	Aisling	Doyle	Curator Assistant	11/00	10/02	Biobank Technician, INFANT Center, ANU Lab, UCC
8	Jungwon	Yoon	Curator Assistant	9/00	6/03	Unknown
4	Lukas	Mueller	Curator	6/00	7/03	Adjunct Professor, Cornell University, BTI
3	Leonore	Reiser	Curator	12/99	3/06	Data Wrangler/Bio-Curator at Phoenix Bioinformatics
2	Margarita	Garcia-Hernandez	Curator	9/99	12/06	Associate Director of Health Analytics, Partnership HealthPlan of California
1	Eva	Huala	Curator	9/99	8/05	Retired, CEO, Phoenix Informatics

Programmers and IT Professionals

	First Name	Last Name	Title	Start	End	Present Position
110	Bo	Xu	Assistant Programmer Research Assistant Intern	3/22 2/16 9/15	- 2/22 1/16	MS, Programmer, Carnegie
64	Anjo	Chi	Programmer	1/08	1/10	Unknown
54	Cindy	Lee	Programmer	10/07	7/11	Software Developer at CardioDx
53	Raymond	Chetty	Programmer	10/07	5/10	Unknown
52	Larry	Ploetz	Systems Admin	3/07	5/13	Operations Engineer, Pinger
47	Shanker	Singh	Database Administrator	7/06	3/13	Senior database administrator, Innovative Interfaces
45	Tom	Meyer	Programmer	6/06	5/10	Backend Engineer at DexaFit, Inc
40	Mohammed	Shaikh	Programmer	12/05	1/06	Unknown
36	Joe	Filla	Systems Admin	2/05	3/07	Director of Operations, QuinStreet
33	Chris	Wilks	Programmer Intern	6/05 6/04	1/11 5/05	MS, PhD, Lead Data Scientist, Neumora
32	Jon	Slenk	Programmer	4/05	7/06	Software Engineer, Apple

29	Doug	Becker	Programmer	5/04	4/06	Technical Accountant Manager, NetApp
27	Jessie	Zhang	Programmer	9/03	5/04	Unknown
24	Behzad	Mahini	Programmer	3/03	1/04	Strategic Business Development, EDLORE
16	Julie	Tacklind	Webmaster	12/01	2/07	Unknown
15	Chunxia	Xu	Programmer	10/01	1/06	Unknown
14	Danny	Yoo	Programmer	6/01	5/06	Software engineer, Google
12	Bryan	Murtha	Programmer	2/01	8/01	Manager of Programming and Databases, Intesa Sanpaolo

Program Managers

	First Name	Last Name	Title	Start	End	Present Position
181	Maricar	Macalincag	Program manager	3/25	-	
165	Gaëlle	Cassin-Ross	Outreach/Training Coordinator	10/23	-	
134	Elena	Lazarus	Program Manager Assistant Research Coordinator RA	5/24 11/21 7/19	- 4/24 10/21	Scientific Coordinator, Water and Life Interface Institute, MSU

Communications Coordinators

	First Name	Last Name	Title	Start	End	Present Position
179	Ashley	Atkinson	Comms Coord	2/25	-	
178	Johanna	Murray	Comms Coord	2/25	-	
171	Morgan	Magilligan	Comm. Coordinator	4/24	-	
160	Kristen	Yawitz	Comm. manager	9/22	12/22	Unknown

Office Staff

	First Name	Last Name	Title	Start	End	Present Position
183	Joe	Saenz	Office Coordinator	5/25	-	
176	Brandi	Howell	Fiscal officer	12/24	-	
170	Amy	Wild	Exec. Secretary	2/24	4/25	
44	Bob	Muller	IT	5/06	6/14	Retired