

CURRICULUM VITAE

NAME: Dr. Robert L. Last

WORK ADDRESS:
Department of Biochemistry and Molecular Biology
301 Biochemistry Building
Michigan State University
603 Wilson Road
East Lansing, MI 48824-1319

EDUCATION:
Ohio Wesleyan University, Delaware, OH; BA in Chemistry with minors in Biology, 1980
Carnegie-Mellon University, Pittsburgh, PA; PhD in Biological Sciences, 1986

PROFESSIONAL AND ADMINISTRATIVE EXPERIENCE:

10/17-present

President Elect, *American Society of Plant Biologists*

5/14-present

Director, NIH Training Grant Program 'Plant Biotechnology for Health and Sustainability'. *Michigan State University.*

9/12- 6/13

***Weizmann Institute of Science*, Erna and Jakob Michael Visiting Professor,
Department of Plant Sciences, Rehovot, Israel**

9/04-present

***Michigan State University*, East Lansing, Michigan
Barnett Rosenberg Professor, *Departments of Biochemistry and Molecular Biology and 106.***

3/03- 9/04

***National Science Foundation*, Arlington, VA:
Program Director, Plant Genomics Research Program.**

10/02-2/03

***Max Planck Institute for Chemical Ecology*, Jena, Germany
Senior Visiting Research Scientist.**

6/98-6/02

***Cereon Genomics LLC*, Cambridge, MA:**

Director of Discovery Genomics at Cereon. Director of Enterprise-Wide Model Organism Functional Genomics at Monsanto.

5/89-6/98

Cornell University: Assistant, Associate and Tenured Senior Plant Molecular Geneticist, Boyce Thompson Institute for Plant Research, Ithaca, NY (Equivalent to tenured Professor). Parallel adjunct appointments in Cornell Sections of Genetics and Development and Plant Biology.

4/86-5/89

Whitehead Institute for Biomedical Research: Postdoctoral Fellow
Laboratory of Dr. Gerald Fink

9/80-4/86

Carnegie-Mellon University: Ph.D. student, Department of Biological Sciences
Laboratory of Dr. John Woolford.

HONORS AND AWARDS:

College of Natural Science Postdoctoral Mentoring Award, Michigan State University, 2017

Erna and Jakob Michael Visiting Professorship, Department of Plant Sciences, Weizmann Institute of Science, Rehovot, Israel, Fall 2012- Summer 2013

Lady Davis Fellowship, Hebrew University of Jerusalem, Israel, Fall 2012

University Distinguished Faculty Award, Michigan State University, February 2012

Distinguished Faculty Award, MSU College of Natural Sciences, November 2011.

Fellow, American Association for the Advancement of Science (AAAS), named 2009

Fellow, American Society of Plant Biologists, named 2009

Monsanto Fellow, named 2002

NSF Presidential Young Investigator Award, 10/90-9/95

Keynote Speaker, North Carolina Biotechnology Center Plant Molecular Biology Retreat, Wrightsville Beach, North Carolina, September, 2007

Keynote Speaker, 4th International Conference on Plant Metabolomics, Reading UK, April 2006

NSF Director's Award for Excellence in Program Management, 2004

Schexnayder Lecture in Botany, Department of Biological Sciences, Louisiana State University, 2011

John and Olga LeTourneau Memorial Lectureship, University of Idaho, 1997

DuPont Science and Engineering Educational Aid Grant, 1996 and 1997

NIH FIRST Grant Award, 1/90-12/94

NSF Plant Molecular Biology Postdoctoral Fellowship, 4/86-5/89

NIH NRSA Fellow under National Institutes of Health Graduate Training Grant, awarded to Carnegie-Mellon University, Biological Sciences Department, 8/83-4/86

Bachelor of Arts in Chemistry, Magna Cum Laude, Ohio Wesleyan University, 1980
Hall Fellow, Chemistry Department, Ohio Wesleyan University, Chemistry Department,
9/79-6/80

PROFESSIONAL ACTIVITIES:

Scientific Conference Organization:

President Elect, President, Past President, American Society of Plant Biologists, 10/17-9/20.

Member of Search Committee for Editor-in-Chief of *The Plant Cell*, American Society of Plant Biologists 4/18-.

Program Committee (organizers of the annual meeting), American Society of Plant Biologists, 2015-2018

co-Organizer, Plant Biotechnology for Health and Sustainability Symposia, Michigan State University, Fall semester 2013-. Faculty organizer for the associated Career Symposia, 2013-.

Lead Organizer, Banbury Conference on Evolution of Plant Specialized Metabolism, 3/13
Chair, Plant Molecular Biology Gordon Conference, 7/00 (Vice-Chair in 1998)

Organizer, NATO Advanced Study Institute on Plant Molecular Biology, 5/97

Symposium Organizer, American Society of Plant Biologists Annual Meeting, 7/09

Symposium Organizer, International Society of Plant Molecular Biology, St. Louis, 10/09

Keystone Symposia Scientific Advisory Board Member 1/01-12/04

Organizing Committee, International Arabidopsis Genetics Conferences, 1997 and 1998

Publications and Editorial:

Associate Editor, *Science Advances*, 2014-2018

Editorial Board Member and Editor in Chief, *The Arabidopsis Book*, 5/07-2013

Associate Editor, *Frontiers in Plant Metabolism and Chemodiversity*, 2012-present

Editorial Board, *Current Opinion in Plant Biology*, 6/97-present

Associate Editor, *Plant Physiology*, 10/99-01/08

Publications Committee, American Society of Plant Physiologists, 10/97-10/99 (resigned to assume role of Plant Physiology Associate Editor)

Monitoring Editor, *Plant Physiology*, 10/94-7/97

American Society of Plant Physiologists *ad hoc* Genomics Publication Committee, 1998-2000

Service to Government Agencies:

Committee of Visitors, National Science Foundation Division of Integrative Organismal Systems, 6/2018.

Co-organizer of NIFA-NSF workshop on Phenomics: Beyond Genomics (with Timothy Close), April 2011, St. Louis. Meeting report document at:

http://www.nsf.gov/bio/pubs/reports/phenomics_workshop_report.pdf

Ad hoc advisor to Genome Alberta (Canada) 2014-

Participant in National Science Foundation - Japan Science Foundation Metabolomics Workshop, UC Davis, May 2010

Member, Site Visit Team, Department of Energy Office of Biological and Environmental Research 10/2010

Member, Committee of Visitors for the Life and Medical Sciences Division, Department of Energy Office of Biological and Environmental Research. 6/2008.

Member of the NAS/NRC Committee on the National Plant Genome Initiative: 2003-2008, Summer 2002. Report at:
<http://books.nap.edu/openbook/0309085217/html/index.html>.

Participant in NAS/NRC Workshop: 'Community Standards for Sharing Publication-Related Data and Materials', February, 2002. Summary of report at:
<http://www.plantphysiol.org/cgi/content/full/132/1/19>.

Participant in Systems Plant Biology Recommendations Workshop for DOE; Riverside, CA, January, 2003. Summary of meeting at:
<http://www.plantphysiol.org/cgi/content/full/132/2/404>).

NIH Grant Review Panel Member, Biological Sciences 1 Study Section (Biol-1), Ad hoc member 7/93; 3/95; 11/95, 2/96
Regular member from 10/96-6/99

NIH Panel Member, Genetics Study Section AREA Grants, 12/91

Committee of Visitors External Review Panel, NSF Division of Molecular & Cellular Biosciences, Biomolecular Structure and Function Cluster, 12/96

Participant in Workshop on DOE Plant Biochemistry Funding Opportunities, Kona, HI, December, 1992

Other Outreach and Community Service:

External Advisory Board, BioDiscovery Institute, University of North Texas, <https://research.unt.edu/institutes/bdi>, 2015-.

External Science Advisory Board, Missouri EPSCoR Program 'Missouri Transect: Climate, Plant and Community' (<http://missouriepscor.org/>). 2014-

External Science Advisory Board, Ohio State University Center for Applied Plant Sciences, <http://caps.osu.edu/>, 2011-2016.

Great Lakes Bioenergy Research Center, Frontiers Strategy Working Group, Fall 2014-Spring 2015 and Vision Group, Fall 2015-Summer 2016.

Board of Directors and BoD Nominations Committee for iPLANT Cyberinfrastructure Collaborative (www.iplantcollaborative.org) Chair 2007-2009; Associate Chair 2009-2010, member 2010

Chair, Scientific Advisory Board for the Genome Canada-funded PhytoMetaSyn project 2009-2014

Organizer of the Plantgenomics@MSU Summer Research Experiences for Undergraduate Internship Program (www.plantgenomics.msu.edu); lead 2006-2012, co-lead 2013-

External Program Review Member, Department of Biochemistry, Biophysics and Molecular Biology, Iowa State University. Fall 2014

American Society of Plant Biologists Eric E. Conn Young Investigator Award Selection Committee 2011-2015

Participant in formulation of a decadal vision: "Unleashing a decade of innovation in plant science", meetings 2011 and winter 2013. This led to a report published by the American Society of Plant Biologists in 2014 (see <https://plantsummit.wordpress.com/>)

Co-organizer for the three-week summer course "Frontiers and Techniques in Plant Sciences" at Cold Spring Harbor Laboratory 2010-2013

Scientific Advisory Committee for the Plant Signaling Cluster at the University of North Texas, Denton 2008-2013

Scientific Advisory Board for Australian Research Council Centre of Excellence in Plant Energy Biology 2008-2013

American Society of Plant Biologists Web Redesign Committee 2009-10

Co-instructor (with Heather Eisthen in MSU Zoology Department) of a 'Grandparents University' (<http://grandparents.msu.edu/about/>) class on the science behind taste and smells 2008, 2009, 2015, 2016.

Co-organizer of session on plant secondary metabolism, International Plant Molecular Biology Conference, St. Louis 2009.

External Review Team Member, University of Missouri Interdisciplinary Plant Group, 4/2008.

Scientific Advisory Group to EU-SOL functional genomics program 2007-
Advisory Group to NCGR-Iowa State Plant Cyberinfrastructure Project Proposal 2006

International Tomato Sequencing Project Advisory Committee 2006-2007

Public Affairs Committee of the American Society of Plant Biologists 2006-2008.

Organizer for the Interagency Working Group on the National Plant Genome Initiative 'Workshop on Plant Genomics Outreach Activities' at the 2004 Plant and Animal Genome Research Conference in San Diego, CA (with Dr. Ed Kaleikau of USDA).

Lead Organizer and Instructor for the three week course 'Arabidopsis Molecular Genetics' at the Cold Spring Harbor Laboratory, summers of 1995, 1996 and 1997

Elected Member, North American Arabidopsis Steering Committee, 1/95-12/98

Member, International Arabidopsis Steering Committee, 5/95-6/97

Past Consulting to Biotechnology Industry:

Calgene

DuPont

Monsanto

Sandoz

GRANT REVIEW ACTIVITIES:

Panel Member, NSF, May 2006, May 2007

Site visit team member for NSF Plant Genome Research Program, UC Berkeley, February 2006.

NIH Panel Member, Biological Sciences 1 Study Section,

Ad hoc member 7/93; 3/95; 11/95, 3/96

Regular member from 10/96-6/99

NIH Panel Member, Genetics Study Section AREA Grants, 12/91
Ad Hoc Reviewer for: BARD, DOE, NSF, NSERC, USDA

COURSES TAUGHT:

BMB/CSS/PLB 856, Plant Molecular and Omic Biology (lead instructor 2006-present; responsible for 19 80-minute class periods and 21 hours lecture per year; with Sheng Yang He and Hideki Takahashi).

BMB 960-301, Seminar in Plants for Health and Sustainability, Fall 2014, 2015, 2016, 2017.

Co-Instructor in Frontiers and Techniques in Plant Sciences course, Cold Spring Harbor Laboratory, NY, three weeks each summer 2010-2012, one week summer of 2013, three days 2014.

Undergrad Genetics Course Zoology 341 - 3 hours of lecture to 250-300 students in Fall Semester 2011.

BMB 978, Seminar in Biochemistry (co-taught with Bill Henry, Fall and Spring semester 2009-2011).

Grandparent University class on the science behind taste and smell. (summer 2008, 2009, 2015)

QB826 – Class period on Interdisciplinary Research in Life Sciences (1.5 h, summer 2008, 2009)

BMB 961 Genomics and Proteomics of Complex Genetic Systems (2 Lectures each Fall 2006, 2008, 2010, 2014)

BMB 101 Meet the Professors (1 Lecture Fall 2005, Fall 2007, Fall 2010, Fall 2013)

Organizer and Instructor in Arabidopsis Molecular Genetics Course, Cold Spring Harbor Laboratory, NY, three weeks each summer 1995-1997

Cornell Bio. Sci. 652: Concepts and Techniques in Plant Molecular Biology (with Ray Wu), 1990-1993

Cornell Bio. Sci. 648: Plant Biochemistry (with André Jagendorf), 1991, 1993, 1995, and 1997

Cornell Bio. Sci. 780: Graduate Seminar in Genetics, Fall Semester, 1992

Cornell Bio. Sci. 782: Current Topics in Plant Biochemical Genetics, Spring Semester, 1994

Cornell Bio. Sci. 742: Current Topics in Plant Molecular Biology, Fall Semester, 1994

Cornell Bio. Pl. 741, Problems in Plant Cell and Biology Research, Coordinator, 1995-1997

ACADEMIC COMMITTEES:

BMB Mass Spectrometry Faculty Search Committee (2017-2018)

Plant Biology Plant Genomics Search Committee, Chair (2016-2017)

Plant Genomics Global Impact Initiative Faculty Search Committee (2016-2017)

MSU Bio-informatics Course Curriculum Committee (2016-)

Plant Biology Departmental Awards Committee (2016-)

Plant Biology Departmental Advisory Committee (2009-2011, 2014-2017)

Plant Biology Faculty Search Screening Committee 2015-2016
BMB Web Committee, Chair (2008-2014, 2015-)
BMB Awards Committee (2013-2015, 2016-)
Michigan State University Provost Search Committee (2013-2014)
Plant Biology Faculty Search Committee (2011-2012)
BMB Seminar Committee, co-chair (2009-2011)
Hannah Professor in Photosynthesis Search Committee (BMB and PRL) (2009)
College of Natural Sciences Faculty Advisory Council Committee on Budget Strategy
(2009)
Plant Biology Departmental Advisory Committee (2009-2011, 2014-2016)
Committee for Joint Recruiting in the Plant Sciences (2008-2009)
MSU Cyberinfrastructure Strategic Planning Committee (2008)
Plant Research Labs Faculty Search Committee (2007-2008)
Plant Science Excellence III Committee, Chair (2006-2007)
Plant Biology Dual Faculty Search Committee, Chair (2006-2007)
University Growth Chamber Management Committee, Co-chair (2006-2007)
Biochemistry and Molecular Biology Faculty Advisory Committee (2005-2007, Chair
2006-2007)
BTI President Search (1994)
BTI Distinguished Lecture Series (1990-1995 and 1996-1998, Chair 1994-1995)
BTI Greenhouse Oversight (1989-1995)
BTI Internal Seminar Series (Co-chair 1990-1991)
BTI Environmental Biologist Search (1992)
BTI Plant Molecular Biologist Searches (1991-1995, 1998)
BTI Benefit Plan Committee (1997-1998)
Cornell Section of Genetics and Development Faculty Search (1993-1994)
Cornell Section of Genetics and Development Seminar Series Organizer (1995-1996)
Cornell Institutional Recombinant DNA Advisory Committee (1992-1998)
Cornell Plant Science Center Graduate Admissions (Co-chair 1991-1992)
Cornell Field of Genetics and Development Graduate Admissions (1991-1994, 1995-
1997, Chair 1992-1994)
Co-Chair of Cornell Plant Cell and Molecular Biology Training Program Admissions
(1996)

MSU and Recent Summer Undergraduate researchers

Rachel Arking, Biochemistry and Molecular Biology, Spring 2018-
Liz Christensen, Plant Biology, Spring 2018-
Tara Caso, Humboldt State University, Summer 2017
Charles Smith, Horticulture and Plant Biology (double major), Summer 2017-
Nasser Mohammed, Biochemistry and Molecular Biology, Fall 2016-Fall 2017
Joseph Wakar, Plant Biology, Fall 2016-Spring 2018
Nicholas Karavolias, Cornell University, Summer 2016
Jacob Reder, Fall 2014-Spring 2017
Kathryn Harmer, Biochemistry and Molecular Biology, Fall 2014-Spring 2018

Eric Nyugen, Biotechnology, Fall 2014-Fall 2016
Abigail Miller, Lyman Briggs and Biochemistry and Molecular Biology, Spring 2013-Summer 2016
Maria Torres Salgado, Lyman Briggs College, Fall 2013
Mike Havern, Biochemistry & Molecular Biology, Fall 2013-Summer 2014
Harry Ashbaugh, Biochemistry & Molecular Biology, Fall 2013-Fall 2014
Grady Colnon, Plant Biology and Genetics (dual), Fall 2013-Spring 2016
Sarah Sprenger, Plant Biology, Fall 2013-Summer 2015
Jacob Bibik, Biochemistry & Molecular Biology, 2012-2013
Christopher Adams, St. Mary's College of Maryland, Summer 2013
Stephanie Onderchanin, Biochemistry & Molecular Biology, Fall 2012-Spring 2013
Evan McNabb, Biochemistry & Molecular Biology, Fall 2011-Spring 2013
Karin Hanisch, Biochemistry & Molecular Biology, Spring 2011-Spring 2014
Vaibhav Mehta, Biochemistry & Molecular Biology Fall 2010-Spring 2011
Jennifer Peres Robles, University of Puerto Rico, Summer 2010
Sara Mir, Human Biology, Fall 2009-Spring 2010
Taylor Johnson, Chemistry, Fall 2009-Spring 2011
Joanne Neugebauer, Ohio Wesleyan University, Summer 2009
Yasmine Abdulhamid, Spring 2009-Spring 2010
Kaitlyn Courville, Lyman Briggs, Spring 2009-Summer 2012
Jacob Emling, Horticulture, Fall 2008-Fall 2009
Andrew Sawin, Alma College, Summer 2008
Allison Cutter, Human Biology, Fall 2008- Summer 2011
Claire Moore, Plant Biology, Spring 2008 – Summer 2011
Amanda Ellsworth, Lansing Community College Graduate, 2008
Jeffrey Grover, Biochemistry & Molecular Biology, 2007- Summer 2011
David Hall, Biochemistry & Molecular Biology, Summer 2007 - Summer 2011
Dennis Miner, Biochemistry & Molecular Biology, 2007- 2010
Kayla Kerr, Medical Technology, Fall 2006 - Spring 2009
Ardian Coku, Biochemistry & Molecular Biology, Fall 2006 - Spring 2009
Jesica Reemmer, Biochemistry & Molecular Biology, Professorial Assistant and undergraduate researcher, Fall 2006- 2008
Elizabeth VanWert, Biochemistry & Molecular Biology, 2006
Ledea Wilder, Biology, Fort Valley State University, Summer 2007
Tim Asher, Biochemistry & Molecular Biology, 2006-2007
Ryan Prunter, Biochemistry & Molecular Biology, Professorial Assistant 2006
Qasim Shakeel, Biochemistry & Molecular Biology, 2006
Ryan Mayle, Professorial Assistant and undergraduate researcher, Biochemistry & Molecular Biology, 2006-2007
Travis Wilson, student worker, project lab aide 2005-2006
Jessica Reif, Plant Biology, student worker, project lab aide 2005-2007
Eduardo Silva, Biology, Lansing Community College, 2005
Nitasha Ahluwalia, Physiology, Fall 2005
Adekunle Omoyosi, Biochemistry & Molecular Biology, Fall 2005

GRADUATE STUDENT THESIS COMMITTEES:

MSU

Natalie Kirkwyland (Horticulture)

Bethany Johnson (Plant Biology)

Brian St. Aubin (Plant Biology)

Daniel Lybrand (Biochemistry and Molecular Biology), Advisor

Tomomi Takeuchi (Biochemistry and Molecular Biology)

Bryan Leong (Plant Biology), Advisor

John Lloyd (Plant Biology, Graduated with PhD, fall, 2017)

Robert (Mike) Sgambelluri (Biochemistry and Molecular Biology, Graduated with PhD, fall, 2017)

Maria Isabel Casas (Ohio State University, Molecular, Cellular and Developmental Biology, Graduated with PhD, spring 2015)

Jie Li (Biochemistry and Molecular Biology, graduating spring 2016)

Cheng Peng (Plant Biology, Graduated with PhD, spring 2015), Advisor

Marcello Campos (Genetics, Graduated with PhD, spring 2015)

Satya Swathi Nadakuduti (Plant Breeding and Genetics, graduated with PhD, spring 2014)

Yani Chen (Plant Biology, Graduated with PhD, fall 2013)

Shannon Bell (Biochemistry and Molecular Biology, Graduated with PhD, summer 2012), Advisor

Kyaw Aung (Plant Biology, Graduated with PhD, 12/11)

Nobuko Sugimoto (Horticulture; Graduated with PhD, 2011)

Sonali Mookerjee (Plant Breeding and Genetics, Graduated with PhD, 01/12)

Jeongwoon Kim (Plant Biology, Graduated with PhD, 12/11), Advisor

Mike Ruckle (Biochemistry and Molecular Biology, Graduated with PhD, 12/10)

Yin Shan (Plant Biology, Graduated with MS, 2010)

Jonathan Glynn (Genetics, Graduated with PhD 12/09)

Wan Song (Genetics, Graduated with PhD 12/09)

Eliana Gonzales Vigil (Genetics; Graduated with PhD 5/09)

Ailing Zhou (Plant Biology, Graduated with MS 09/07)

Cornell

Elaine Radwanski (Genetics and Development, Graduated with PhD 6/95), Advisor, Professor Emerita, Carthage College

Chad Williams (Plant Biology, Graduated with M.S. 12/96), Advisor

Daniel Kliebenstein (Genetics and Development, Graduated with PhD, 4/99), Advisor, Professor, U. California, Davis

Bingwei Lu (Genetics and Development, Graduated with PhD, 9/95)

Wenpei Su (Plant Biology, Graduated with PhD, 12/93)

Christian Tobias (Plant Biology, Graduated with PhD, 1/95)

Anton Callaway (Plant Biology, Graduated with PhD, 1/98)

Noelle Green (Genetics and Development; graduated with PhD 4/98)

Carolyn Schultz (Biology, New York University; Graduated with PhD 1994)
Ming-Hsiun Hsieh (Biology, New York University, Graduated with PhD 1999)
Rosana Melo-Oliveira (Biology, New York University, Graduated with PhD 1999)
Amy Casselman (Genetics and Development)
Amy Loniello (Plant Pathology)
Hsin-Mei Ku (Plant Biology)
Men-Chi Chang (Plant Biology)
Steve Daughety (Biochemistry)
Yan Xu (Plant Biology)
Timothy Milos (Plant Pathology)

TRAINEES:

Postdoctorals:

Dr. Jiayang Li, Vice Minister for Agriculture, President of the Chinese Academy of Agricultural Science, Vice President of the Chinese Academy of Sciences, Past Director, Genetics Institute of the Chinese Academy of Sciences, Beijing, PR China

Patricia L. Conklin, Professor of Genetics, State University of New York, Cortland, NY.

Dr. Alan B. Rose, Res. Professor of Biochemistry, Molecular and Cell Biology, University of California, Davis

Dr. Georg Jander, Professor, Boyce Thompson Institute for Plant Research, Cornell University

Dr. Hyeonsook Cheong, Professor of Genetic Engineering, Chosun University, Korea
Katherine J. Denby, Professor, University of York and Academic Director of the N8 Agri-food Resilience Programme, UK

Dr. D. Palitha Dharmawardhana, Research Associate, Department of Botany and Plant Pathology, Oregon State University

Dr. Byung-Chul Kim, Assistant Research Professor, Pohang Institute for Science and Technology, Pohang, South Korea

Dr. Laurie G. Landry, Assistant Professor, Monmouth College, Long Branch, NJ
Susan R. Norris, Yield Physiology Team Lead, Monsanto Corp., St. Louis, MO

Dr. Kim D. Pruitt, Bioinformatician, National Center for Biological Information, National Library of Medicine, Bethesda, MD

Dr. Jianmin Zhao, Research Scientist, Monsanto Inc., St. Louis, MO (retired)

Dr. Liping Gu, Manager, Functional Genomics Core Facility, South Dakota State University.

Dr. Anthony Schillmiller, Assistant Manager of the MSU Mass Spectrometry Facility

Dr. Imad Ajjawi, Senior Scientist, Synthetic Genomics Co., La Jolla, CA.

Dr. Yan Lu, Assistant Professor, Western Michigan University, Kalamazoo, MI

Dr. Bjorn Lundin, Assistant Professor, Gothenburgs University, Sweden

Dr. Kiyoon Kang, Postdoctoral, Seoul National University

Dr. Jing Ning, Scientist, QIAGEN, Frederick, MD

Dr. Gaurav D. Moghe, Assistant Professor, School of Integrated Plant Science, Cornell University

Dr. Jun Liu, Group Leader, Oil Crops Research Institute of the Chinese Academy of Agricultural Sciences, Wuhan, China

Dr. Anqi Xin

Dr. Pengxiang Fan

Dr. Yann-Ru Lou

Dr. Craig Schenck

Dr. Rachel Kerwin

Graduate Students:

Dr. Daniel J. Kliebenstein, Professor of Plant Science, UC Davis

Dr. Elaine R. Radwanski, Professor Emerita, Carthage College, Kenosha, WI

Mr. Chad Williams, High School Biology Teacher, Greater Los Angeles Area

Dr. Cheng Peng, Plant Biology student advisee, Scientist, Novozymes, Beijing, China

Dr. Jeongwoon Kim, Plant Biology student advisee, Bioinformaticist, Monsanto Co., St. Louis

Dr. Shannon Bell, Biochemistry and Molecular Biology student advisee, Staff Toxicologist at Integrated Laboratory Systems, Research Triangle Park, NC

Mr. Bryan Leong, Plant Biology student advisee, 5/14-

Mr. Daniel Lybrand, Biochemistry and Molecular Biology student advisee, 3/15-

Mr. Paul Fiesel, Biochemistry and Molecular Biology student advisee, 5/18-

Dr. Mariko Takayama, Visiting Graduate Student from University of Tsukuba, Japan fall 2011.

Visiting Scientists:

Dr. Jeff Shen, Professor, University of Nevada, Las Vegas, Summer 2009

Dr. Joseph Hirschberg, Chair, Department of Genetics, Hebrew University, Jerusalem, Israel (9/01-8/02)

Dr. Thomas Mitchell-Olds, Professor, Duke University (Sloane Foundation Funded Leave 8/93-6/94)

Dr. Douglas P. Ormrod, Dean, University of Guelph (NSERC Funded Leave 9/93-1/94)

CONTRACT AND GRANT SUPPORT

To R.L.L. as PI or co-PI:

Pending:

NIH T32GM110523 Graduate Training Grant: Plant Biotechnology for Health and Sustainability approx. \$1.97 M requested, Program Director. 7/2019-6/2024.

NSF REU Site: Plant Genomics at MSU co-PI with Cornelius Barry as PI 3/1/2018-2/28/2021 \$334,174

NSF Collaborative Research: The interaction of selection, pleiotropy, and drift in phenotypic evolution. co-PI with Jeff Connor PI. \$707,000 requested

Funded:

DOE DE-FOA-001540: Great Lakes Bioenergy Research Center, Switchgrass Productivity Subgroup, co-PI, 12/2017-11/2018 (renewable annually), \$120,258.

NSF IOS-1546617 RESEARCH-PGR: How do plants produce so many diverse metabolites: A computational and experimental comparative genomics investigation in the Solanaceae, \$5.3M, PI with four co-PIs. 8/1/2016-7/31/2020.

NSF CBET-1565232 Collaborative Research: Production of known and novel, safe, and biodegradable pyrethrin-type insecticides in tomato, \$300K, PI, 8/1/2016-7/31/2019.

NIH 1T32GM110523-01 Graduate Training Grant: Plant Biotechnology for Health and Sustainability approx. ~\$950K, Program Director. 7/2014-6/2019.

NSF DBI-1358474 Research Experiences for Undergraduates Site: Plant Genomics at Michigan State University \$314,103, co-PI with Cornelius Barry as PI 9/15/14-8/31/17.

NSF MCB-124400 Identifying and Understanding Connections Between Photosynthesis and Amino Acid Biosynthesis. \$1.5M. co-PI with Yan Lu (Western Michigan University) as PI. 2/2013-2/2018.

NSF MCB-1119778 Computational and Experimental Studies of Plastid Functional Networks; \$1.22M. co-PI, with Shinhan Shiu as PI. 2/2012-1/2017.

NSF MCB-1129780 Workshop: Phenomes - Beyond Genomes; April 1-2, 2011, St. Louis MO, \$21.4K. 3/15/11-2/29/12.

NSF IOS-1025636 GEPR: Building and operating chemical factories: Comparative studies of biochemical pathways for defense compounds in the Solanum, ~\$4.5M PI, with 3 co-PIs, 4/1/11-3/31/16.

NSF DBI-1004425 Research Experiences for Undergraduates Site: Plant Genomics at Michigan State University \$282,606, PI with Richard Allison, co-PI, 9/15/10-8/31/13.

NSF DBI-0604336, GEPR: Building and Running a Chemical Factory, ~\$3.2M total, PI with 6 co-PIs, 2006-2009.

NSF DBI-0619489, Major Research Instrumentation: Acquisition of Mass Spectrometry Equipment for MSU, ~\$790K total, co-PI, 2006.

NSF MCB-0519740, Arabidopsis 2010: Understanding Chloroplast Function, ~\$4.0 M total, PI, with 7 co-PIs, 12/1/05-11/31/09.

NIH, Arabidopsis Tryptophan Biosynthesis Molecular Genetics, ~\$1.2 M total, 1/90-12/98

USDA-NRICGP, Biochemical and Molecular Genetics of Oxidative Stress Response in Arabidopsis, 9/96-8/99, \$231,000 total (renewed for three years in 1999 with Patricia Conklin as P.I.)

USDA-NRICGP, Arabidopsis: A Model System for the Study of UV-B Response in Higher Plants (R. Amundson, co-PI), \$140,000 total, 9/90-8/93

Biotechnology Research and Development Corporation, Tryptophan Biosynthesis in the Plant *Arabidopsis thaliana*: Tools for Plant Biotechnology, \$300,000 total, 4/92-5/95

NSF Presidential Young Investigator Award, \$312,500 total, 10/90-3/97

DuPont Nemours, Educational Aid Program, \$15,000, 1997-1998

DuPont Nemours, Educational Aid Program, \$15,000, 1996-1997

Pioneer Hi-Bred International, Oxidative stress-sensitive Arabidopsis mutants as a tool for investigating plant-pathogen interactions, \$70,000 total, 10/97-9/99

Cornell Biotechnology Award, The Molecular Genetics of UV-B Screening Pigments in the Plant *Arabidopsis thaliana*, \$50,000 total, 7/90-6/92

Cornell Biotechnology Award, Molecular Cloning of the Protein Associated with the Inducible Nitrate Transport System in Rice Roots (R. Spanswick, co-PI), \$29,000 total, 7/91-6/92

Pre- and Post-Doctoral Fellowships to Advisees:

Susan R. Norris, NIH/NRSA Postdoctoral Fellowship, Ascorbic Acid in Plants: Synthesis and Function, \$79,312 total - stipend and institutional allowance, 9/97-8/00

Patricia Conklin, American Cancer Society Postdoctoral Research Training Fellowship Award, *Arabidopsis*: A Model for the Study of Ozone Stress, \$78,000 total - stipend and institutional allowance, 9/92-8/95

John Sheahan, USDA Postdoctoral Research Award, Approaches to Improve the UV-B Resistance of *Arabidopsis thaliana*, ~\$60,000, 9/93-9/94

Laurie Landry, USDA Postdoctoral Fellowship, UV-B and Oxidative Stress Response in *Arabidopsis thaliana*, salary and institutional allowance, ~60,000 total, 8/94-7/96

Hyeonsook Cheong, Professor Training Program to Study Abroad from the Korean Government, Tryptophan Mutants and Genes as Selectable Markers for Plant Transformation, \$17,000 total, 12/92-11/93

Byung Chul Kim, Korean Science Foundation Postdoctoral Fellowship, \$17,000, 1996-1997

Daniel Kliebenstein, Plant Science Center Graduate Fellowship and NIH Training Fellowship, Molecular Genetic Dissection of Plant Oxidative Stress Response, stipend/tuition and fees, 8/93-5/99

Elaine Radwanski, Plant Science Center and HHS Graduate Fellowships, Molecular and Genetic Characterization of a Tryptophan Biosynthetic Mutation in *Arabidopsis thaliana*, stipend/tuition and fees, 7/90-6/95

Marc Dauphine, Plant Science Center Undergraduate Summer Award, salary plus supplies, summer of 1990

Sushma Reddy, NYS College of Veterinary Medicine Research Apprentice Program for Minority High School Students, salary plus supplies, summer of 1991

Amy Casselman, Plant Science Center Undergraduate Summer Award, salary plus supplies, summer of 1991

Jenny Fu, Plant Science Center Undergraduate Summer Award, salary plus supplies, summer of 1992

Pam Liang, Plant Science Center Undergraduate Summer Award, salary plus supplies, summer of 1993

Meng Xhang, Cornell Howard Hughes Undergraduate Fellowship, salary plus supplies, academic year 1993-1994

Elizabeth Williams, Plant Cell and Molecular Biology Summer Trainee, salary plus supplies, summers of 1995 and 1996

Jackie Lim, Cornell Howard Hughes Undergraduate Fellowship, salary plus supplies, summers of 1996 and 1997

Magdaly Cintron-Mariani, Cornell Minority Summer Research Experience Program, salary plus supplies, summer of 1997

PUBLICATIONS:

(ORCID: orcid.org/0000-0001-6974-9587)

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104. Xing, A. and **R.L. Last**. 2017. A regulatory hierarchy of the Arabidopsis branched-chain amino acid metabolic network. *Plant Cell* 29: 1480–1499. [10.1105/tpc.17.00186](http://dx.doi.org/10.1105/tpc.17.00186).
105. Leong, B. and **R.L. Last**. 2017. Promiscuity, impersonation and accommodation: evolution of plant specialized metabolism. *Curr. Opin. Struct. Biol.*, [Volume 47](#), December 2017, Pages 105–112 <https://doi.org/10.1016/j.sbi.2017.07.005>.
106. Liu, J. and **R.L. Last**. 2017. A chloroplast thylakoid lumen protein is required for proper photosynthetic acclimation of plants under fluctuating light environments. *Proc. Natl. Acad. Sci. USA*, 114(38):E8110-E8117, [doi: 10.1073/pnas.1712206114](http://dx.doi.org/10.1073/pnas.1712206114).
107. Moghe, G.D., B.J. Leong, S. Hurney, A.D. Jones and **R.L. Last**. 2017. Evolutionary routes to biochemical innovation revealed by integrative analysis of a plant defense related specialized metabolic pathway. *eLife* 2017;6:e28468 [doi: https://doi.org/10.7554/eLife.28468](https://doi.org/10.7554/eLife.28468).
108. Fan, P., A.M. Miller, X. Liu, A.D. Jones and **R.L. Last**. 2017. Evolution of a flipped pathway creates metabolic innovation in tomato trichomes through BAHD enzyme promiscuity. *Nat. Comm.* 8, Article number: 2080. [DOI: 10.1038/s41467-017-02045-7](https://doi.org/10.1038/s41467-017-02045-7)
109. Xu, H., G.D. Moghe, K. Wiegert-Rininger, A.L. Schillmiller, C.S. Barry, **R.L. Last** and E. Pichersky. 2018. Identification of dehydrogenases involved in the biosynthesis of the monoterpene moiety of pyrethrin. *Plant Physiol.* Vol. 176, pp. 524–537 DOI: <https://doi.org/10.1104/pp.17.01330>
110. Li, J., S. Tietz, J. Cruz, D. Strand, J. Liu, Y. Xu, **R.L. Last**, J. Chen, D. Kramer and J. Hu. Photometric screens identified peroxisome proteins involved in photosynthesis under dynamic light. Submitted.

111. Xu, H., D. Lybrand, S. Bennewitz, A. Tissier, **R.L. Last** and E. Pichersky. 2018. High-level production of trans-chrysanthemic acid, the monoterpene acid moiety of natural pyrethrin insecticides, in tomato fruit. *Metab. Eng.* 47:271-278
<https://doi.org/10.1016/j.ymben.2018.04.004>.
112. Moore, B.M., P. Wang, P. Fan, B. Leong, C.A. Schenck, J.P. Lloyd, M. Lehti-Shiu, **R.L. Last**, E. Pichersky, S.-H. Shiu. 2018. Robust predictions of specialized metabolism genes through machine learning. *bioRxiv*. <https://doi.org/10.1101/304873>

INVITED SEMINARS 1997-Present:

1997

Keystone Symposium on Metabolic Engineering in Transgenic Plants, Copper Mountain, CO, Invited Speaker, April

Organizer and Speaker at Eighth NATO Advanced Study Institute: Cellular Integration of Signaling Pathways in Plant Development, Maratea, Italy, May

USDA Plant Gene Expression Center, Albany, CA, January

University of California, Davis, Plant Biology, January

Calgene, Davis, CA, January

University of Missouri, Interdisciplinary Plant Group, Columbia, MO, February

University of Delaware, Department of Plant and Soil Sciences, Newark, DE, February

Rutgers University, Agricultural Biotechnology Institute, New Brunswick, NJ, May

University of Munich, Department of Pharmaceutical Biology, Munich, Germany, May

Plant Biochemistry Course, Washington State University, Pullman, July

Noble Foundation, Plant Molecular Biology Department, Ardmore OK, September

Harvard Medical School, Department of Molecular Biology (student invited), Boston, MA, November

LeTourneau Memorial Lectureship, Department of Microbiology, Molecular Biology and Biochemistry, University of Idaho, Moscow, ID, November

Purdue University, Department of Botany and Plant Pathology (student invited), W. Lafayette, IN, December

1998

Max Planck Institute of Chemical Ecology, Inaugural Symposium, Jena, Germany, April

EMBO Course: Molecular and Biochemical Analysis of Arabidopsis, Cologne, Germany, May

International Conference on Arabidopsis, Madison, Wisconsin, Organizer, June (attended but transferred speaking invitation to postdoc in group)

Gordon Research Conference on Plant Molecular Biology, New England College, New Hampshire, Co-Chair, July (attended but transferred speaking invitation to postdoc in group)

Monsanto, Nutrition and Consumer Products Sector, St. Louis, MO, March

Cereon Genomics, Cambridge, MA, March

DuPont Agricultural Products, Newark, DE, March
Lecturer in Cold Spring Harbor Laboratory Arabidopsis Genetics Course, July
Cold Spring Harbor Arabidopsis Genetics Course, July

1999

Iowa State Plant Science Lecture Series, 'Advances in Plant Physiology', Ames, Iowa, January (Declined)

Texas A&M University, Biology Department, College Station, TX, January.

Research Triangle Park Area Biotechnology Center Seminar Series. November.
Indian Institute of Science and Technology, Microbiology Department, Bangalore, India, May.

2000

Keynote Address, University of Massachusetts Plant Biology Colloquium, Amherst, MA, March

Lecture in Cold Spring Harbor Laboratory Arabidopsis Genetics Course, July
Plant Molecular Biology Gordon Conference, Holderness Academy, Henniker, NH, Meeting and Session Chair, July

International Training Course on Plant Gene Isolation and Agronomic Use of Transgenic Crops, Beijing, China, October

Weizmann Institute for Science, Plant Sciences Department, Rehovot, Israel, October
Keynote Address at Ben-Gurion University of the Negev Biotechnology Conference "2000 - the Era of Biotechnology", Beer-Sheva, Israel, October

Lecture in Genomics Course at New York University, December

2001

Keystone Conference on Plant Genomics, Big Sky Montana, January

Ohio State University, Plant Biology Seminar Series, April

Lecture in Genomics Course at Yale University, October

2002

Workshop on Evolutionary Genomics, New York University, NYC, Speaker and Participant, February

Orthodox Union Annual Meeting, New York City, NY, Invited talk on Plant Biotechnology to the group of Orthodox Rabbis who certify foods as Kosher, April.

Cornell Genomics Lecture Series Speaker, Ithaca, NY, May

New York University, Biology Departmental Seminar, NYC, NY, May

University of Connecticut, Department of Plant Sciences, Storrs, CT, June

Plant Molecular Biology Gordon Conference, Holderness Academy, Henniker, NH, Invited Speaker and Session Chair, July

PlantGenix Co., Philadelphia, PA, July

Purdue University, Biochemistry Department, W. Lafayette, IN, August

National Science Foundation, Plant Genomics, Arlington, VA, August

University of California Riverside, Genomics Institute, Riverside, CA, September

Dartmouth College, Biology Department, Hanover, NH, September
Max Planck Institute for Chemical Ecology, Plant Genetics and Evolution Department,
Jena, Germany, October
Rutgers University, Biotechnology Center for Agriculture and the Environment, New
Brunswick, NJ, October
University of Minnesota, Center for Microbial and Plant Genomics and Department of
Plant Biology, Minneapolis, MN, October
Max Planck Institute for Molecular Plant Physiology, Golm, Germany, November
Max Planck Institute for Plant Breeding Research, Cologne, Germany, November
John Innes Centre, Norwich, UK, December
University of York, Centre for Novel Agricultural Products, York, UK, December
New York Botanical Gardens, New York City, NY, December
Indiana University, Bloomington, IN, December

2003

22nd Symposium in Plant Biology, UC Riverside, Panel Discussion Participant, January
DOE Workshop on Plant Systems Biology, Riverside, CA, Discussion Leader, January
Institute of Genetics and Crop Plant Research (IPK), Gaterslaben, Germany, February
Brookhaven National Laboratory, Biology Department, Upton, NY, March
Cornell University, Plant Biology Department, Ithaca, NY, May
Plant GEMs (Genomic European Meetings), 2nd Annual Meeting, York, UK, September
The Institute for Genomics Research, Rockville, MD, October

2004

Worcester Polytechnic Institute, Biology and Biotechnology Department, Worcester,
MA, January
Rutgers University, Biotechnology Center for Agriculture and the Environment, New
Brunswick, NJ, April
Michigan State University, Biochemistry and Molecular Biology Department, E.
Lansing, MI, April
Colorado State University, Plant Genomics Outreach Visit talk on Opportunities for
Training and Public Outreach Using Plant Genomics Research Projects. Fort Collins,
CO, June
Rice University, Institute for Biosciences and Bionengineering, Houston TX, May
Dana Farber Hospital, Harvard Medical School, Boston, MA, July
Michigan State University, Plant Biology Department Retreat, E. Lansing, MI October
New Century, New Trees, Biotechnology as a tool for forestry in North America, NC
Biotechnology Center, Research Triangle Park, NC, November.

2005

Enzymology and Metabolism Discussion Group, MSU, March
Michigan State University Post Doctoral Association, Career Development Seminar on
Career Choices, MSU, May
Ohio State University, Practical Summer Workshop in Functional Genomics, July

Noble Foundation, Plant Biology Division Seminar, Ardmore, OK, November
U. North Texas, Biology Department Seminar and taught class in Plant Biochemistry and Biotechnology Course, Denton TX, December

2006

NSF site visit to UC Berkeley, February
Genetics Research Forum Seminar, MSU, February
University of Michigan, Molecular, Cellular and Developmental Biology, Ann Arbor, MI, March
Keynote Speaker, 4th International Conference on Plant Metabolomics, Reading, UK, April
Invited Panelist, Conference on Public Goods and University-Industry Relationships in Agricultural Biotechnology, Washington DC, May
Speaker and Session Chair, American Society of Plant Biologists Annual Meeting, Boston, August
Invited Speaker, Symposium on Research into Plant Secondary Metabolites and Medicinal Phytocompounds (II), Institutes of BioAgricultural Sciences, Academia Sinica, Taipei, Taiwan, December
Seminar, Genetics Institute of the Chinese Academy of Sciences, Beijing, China, December

2007

Seminar, BASF Agricultural Research and Development Center, Research Triangle Park, NC, February
Seminar, Plant Molecular and Cellular Biology Program, University of Florida, Gainesville, FL, March
Participant in Workshop on Running a Laboratory, American Society of Plant Biologists Annual Meeting, Chicago, IL, July
Panelist, Careers Workshop, American Society of Plant Biologists Annual Meeting, Chicago, IL, July
Invited Speaker, Solanaceae 2007, Jeju Island, Korea, September
Keynote Speaker, North Carolina Biotechnology Center Plant Molecular Biology Retreat, Wrightsville Beach, North Carolina, September

2008

Seminar, University of Windsor, Department of Biological Sciences, Windsor, Ontario, Canada, March
Seminar, University of California, Berkeley, Department of Plant and Microbial Biology, April
Invited Speaker, Plant Secondary Metabolism Symposium, University of Minnesota, May
Invited Speaker, Banff Conference on Plant Metabolism, Banff, Canada, July
Seminar, Genetics and Cell and Molecular Biology Programs Retreat, Michigan State University, Kellogg Biological Station, August

Invited Speaker, Plant Energy: Genes to Environment Conference, ARC Centre of Excellence in Plant Energy Biology, Canberra, Australia, September
Keynote Speaker, COMBIO 2008, Canberra, Australia, September
Invited Speaker, Chloroplast Biology Symposium, Institute of Plant and Microbial Biology, Academia Sinica, Taiwan, September

2009

Speaker, American Association for the Advancement of Sciences (AAAS) Meeting: The Promise of Translational Research for Sustainable Agriculture: Darwin on Steroids", Chicago, February

Speaker, 2009 Texas A&M Molecular and Environmental Plant Sciences Symposium, College Station, March

Speaker, Plant Biology Graduate Group Seminar Series, University of California, Davis, March

Symposium Organizer and Speaker, American Society of Plant Biologists Annual Meetings, July

Symposium Organizer, International Society of Plant Molecular Biology, St. Louis, October

Invited Speaker, Agron-Omics Plant Growth Biology and Modeling Workshop, Elche, Spain, October

Invited Speaker, Symposium: Metabolism, metabolomics and metabolic engineering in plants to increase crop productivity and nutritional value, Ein Gedi, Israel, November.

Speaker, Department of Crop Sciences, University of Illinois, Champaign-Urbana. November.

2010

Speaker, Washington State University, Pullman, March.

Speaker, University of Arizona, Tucson, March.

Speaker, Howard University, Washington, DC, March.

Speaker, Science University, College of Natural Sciences, MSU, April

Speaker, Donald Danforth Plant Science Center, St. Louis, MO, May

Participant in National Science Foundation - Japan Science Foundation Metabolomics Workshop, UC Davis, May

Participant at iPlant 2010 Conference, Las Vegas, NV, May

Invited Speaker, 21st International Conference on Arabidopsis Research, Yokohama, Japan. Two presentations, June.

Invited Speaker, CREST Metabolic Biology Symposium, Kyoto, Japan, June

Instructor and speaker, Course on Molecular Plant Science, Cold Spring Harbor Laboratory, July.

Invited Speaker, MSU-DOE Plant Research Laboratory Retreat, Kellogg Biological Station, October.

Plenary Speaker, University of Georgia Retreat of The Plant Center, Unicoi State Park, GA, October.

2011

Speaker, Purdue University Horticulture Department, E. Lafayette, IN, March.

Speaker, Rice University, Biochemistry and Cell Biology Department, March 2011

Speaker and co-Organizer, NSF-NIFA Workshop on Phenomics, St. Louis, MO, April.

Speaker, Annual Project Meeting of the ARC Centre of Excellence in Plant Energy Biology, Perth, Australia, April.

Keynote Speaker, American Society of Plant Biologists Northeast Section Meeting, U. New Hampshire, Durham, NH, May.

Instructor and speaker, Course on Molecular Plant Science, Cold Spring Harbor Laboratory, July.

Panelist - Alternative Careers Workshop. Michigan State University Cell and Molecular Biology and Genetics Retreat. August.

Plenary Speaker, International Botanical Congress "Botanikertagung 2011", Berlin, Germany, September.

Keynote Speaker, Heinrich-Heine-University Graduate Program in Plant Sciences (iGRAD-Plant) retreat, Germany, September.

Presentation to NIFA-USDA and NSF staff on Genomes to Phenomes Workshop report. Arlington, VA, September.

Invited participant in the 'Plant Biology Summit' strategic planning workshop, sponsored by the American Society of Plant Biologists at Howard Hughes Medical Institute, Chevy Chase, MD, September.

Speaker, Ohio Wesleyan University Botany and Bacteriology Department, Delaware, OH, October.

Participant in Banbury Workshop on Genotype to Phenotype, Huntington, NY, October.

Charles Schexnayder Lecture in Botany, Louisiana State University Biology Department, Baton Rouge, LA, November.

Invited Speaker at the Meinhart Zenk Memorial Symposium, Phytochemical Society of North American 50th Anniversary Conference, Kona, HI, December.

2012

Speaker, Weizmann Institute of Science, Rehovot, Israel, March.

Instructor and speaker, Course on Molecular Plant Science, Cold Spring Harbor Laboratory, July.

Speaker, University of North Texas Cell Signaling Cluster Seminar Series, Denton, TX, October.

2013

Participant in the 'Plant Biology Summit II' strategic planning workshop, sponsored by the American Society of Plant Biologists at Howard Hughes Medical Institute, Chevy Chase, MD, January.

Lead Organizer and Speaker at the Banbury Conference 'Evolution of Plant Metabolic Diversity', Cold Spring Harbor Banbury Conference Center, Huntington, NY. March.

Speaker, Hebrew University of Jerusalem, Faculty of Agriculture, Rehovot, Israel, March.

Speaker, Weizmann Institute of Science, Department of Plant Sciences, Rehovot, Israel, April.

Speaker, Tel Aviv University, Department of Molecular Biology and Ecology of Plants, Tel Aviv, Israel, May

Speaker, Migal, Galilee Technology Center, Kiryat Shmona, Israel

Speaker, Heinrich-Heine-University Graduate Program in Plant Sciences (iGRAD-Plant) retreat, Germany, June

Instructor and speaker, Course on Molecular Plant Science, Cold Spring Harbor Laboratory, July.

University Lectureship, Biology Colloquium, University of Wisconsin, Madison, WI, September.

Speaker, Fudan University, Shanghai, China, October.

Invited Speaker, SOL2013 Conference, Beijing, China, October.

Speaker, Institute of Genetics and Developmental Biology, Chinese Academy of Sciences, Beijing, October.

2014

Panelist, Academic Careers Workshop, Michigan State University Cell and Molecular Biology and Genetics Graduate Programs, April.

Speaker, Biology Department, Oberlin College, Oberlin, OH, April.

Invited Speaker, Solanum, Biodiversity Symposium, Universidad Técnica Particular de Loja, Loja, Ecuador, May.

Speaker, University of California, Riverside, Center for Plant Cell Biology, Riverside, CA, June.

Keynote Speaker, 21st International Symposium on Plant Lipids, Guelph, Canada, July
Lab instructor and speaker, Course on Molecular Plant Science, Cold Spring Harbor Laboratory, July.

Speaker, University of Warwick Systems Biology Centre, Warwick, UK, September.

Speaker, Plant Metabolic Engineering for High Value Products Meeting, Warsaw, Poland, September.

Center for Sustainable Resource Science, RIKEN, Yokohama, Japan, October.

Invited Speaker, Naito Conference on Molecule-based Biological Systems, Gateaux Kingdom Sapporo, Sapporo, Japan, October.

Speaker, Chinese Academy of Agricultural Sciences, Beijing, China, October.

Speaker, Institute of Botany, Chinese Academy of Science, Beijing, China, October.

Speaker, Department of Biological Sciences, Michigan Technological University, Houghton, MI, November.

Speaker, Weizmann Institute of Science, Department of Plant Sciences, Rehovot, Israel, December

2015

Speaker, Division of Molecular and Cellular Biology, National Science Foundation, January

Speaker, Department of Biochemistry, Biophysics and Molecular Biology, Iowa State University, March.

Speaker, Department of Biology, Western Michigan University, May.

Speaker (for Frontiers Working Group), Great Lakes Bioenergy Research Center Retreat, South Bend, IN, May.

Participant on the panel how to get funding at NSF, MSU Kellogg Conference Center, August

Speaker, Kellogg Biological Station, Michigan State University, September

Speaker, Institut de Biologie Moléculaire des Plantes, Le Centre National de la Recherche Scientifique (CNRS), Montpellier, France, October

Invited Speaker and Session Chair, 12th Annual Solanaceae Conference, Bordeaux, France, October.

Speaker, Biology Department Seminar, California State University, Fullerton, CA, November

Speaker, Biological Research Seminar, California State University, Dominguez Hills, Carson, CA, November

Speaker, Biology Department Seminar, California State University, Northridge, CA, November

Invited Speaker, Genomics and Metabolomics for Phytochemical Research Symposium, Pacifichem 2015, Honolulu, HI, December

2016

Invited speaker, UC Davis Plant Biology Graduate Group Seminar Series, Davis, CA, April. Trainee invited.

Participant, Microbial and Plant Systems Modulate by Secondary Metabolites, DOE Joint Genome Institute, Walnut Creek, CA, May

Invited speaker, Small Molecules in Plants Symposium, Fujian Agriculture and Forestry University, Fujian, China, August

Invited Keynote Speaker, 13th Annual Solanaceae Conference: From Advances to Applications, Davis, CA, September

Invited Speaker, Michigan State University Department of Plant Biology Seminar, East Lansing, MI, November

Invited speaker, Cornell University School for Integrative Plant Science, Ithaca, NY, November

2017

Invited participant, NSF Workshop on Bioprivileged Molecules, Arlington, VA, January

Invited speaker, Frontiers in Plant Science Cluster of Excellence on Plant Science Summer School. Cologne, Germany, June.

Keynote speaker, Innovative Translational Agricultural Research Symposium, Academia Sinica, Taipei, Taiwan, July.

Invited speaker, Frontiers in Biology Program, Wake Forest University, Winston-Salem, NC, November.

2018

Panelist: How to Get the Most out of Seminar Visits, Career Development Workshop for BMB Graduate Students, MSU, January

Invited Speaker, Plant Biology Department, Carnegie Institution at Stanford University, Palo Alto, CA, February

Invited Speaker, Biochemistry Department, Purdue University, W. Lafayette, IN, February

Invited Speaker, Tsinghua University, Beijing, PR China, March

Invited Speaker, Institute of Genetics and Development, Chinese Academy of Sciences, Beijing, PR China, March

Invited Speaker, Shanghai Institute of Plant Physiology and Ecology, Chinese Academy of Sciences, Shanghai, PR China, March

Invited Speaker, University of Illinois, Champaign-Urbana, April

Invited Speaker 34th Annual Interdisciplinary Plant Group Symposium, University of Missouri, Columbia, MO, May

Invited Speaker, International Plant Molecular Biology Conference, Montpellier, France, August

Invited Speaker, 2018 World Life Science Conference, Beijing, China, October