

Susan Rundell Singer

Vice President for Academic Affairs, Provost, and Professor of Biology

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POSITIONS

Vice President for Academic Affairs and Provost, Rollins College, August 2016-present

Professor of Biology, Rollins College, August 2016-present

Division Director, National Science Foundation, Division of Undergraduate Education, January 2013-July 2016

Laurence McKinley Gould Professor of the Natural Sciences, Emerita, Carleton College, October 2016-present

Laurence McKinley Gould Professor of the Natural Sciences, Carleton College 2006- 2016

Co-director, Carleton Interdisciplinary Science and Math Initiative, Carleton College 2005-2006

Director, Perlman Learning and Teaching Center, Carleton College, 2000-2003

Humphrey Doermann Professor of Liberal Education, Carleton College, 2000-2003

Program Director, Developmental Mechanisms, National Science Foundation, 1999-2001

Professor of Biology, Carleton College, 1998-present

Department Chair, Carleton College, 1995- 1998

Associate Professor of Biology, Carleton College, 1992-1995

Assistant Professor of Biology, Carleton College, 1986-1992

Postdoctoral Research Associate, Rensselaer Polytechnic Institute, 1986

EDUCATION

B.S. *summa cum laude* Rensselaer Polytechnic Institute 1981

New York State teaching certification program: grades 6-12 – life science, chemistry, physics, and general science, College of St. Rose 1981

M.S. Rensselaer Polytechnic Institute 1982

Thesis: *Herbicide Tolerant Plants Via Cell Culture*

Ph.D. Rensselaer Polytechnic Institute 1985

Thesis: *Spatial and Temporal Aspects of Floral Determination in Nicotiana tabacum L.*

Advisor: Dr. Carl N. McDaniel

Professional Development:

Embryology Course, Marine Biological Laboratory, Woods Hole Massachusetts, 1983 (summer)

NSF Academy executive leadership development courses and coaching (2013 -2015)

SACSCOC Academic Peer Evaluator Training (2018)

Awarded an Executive Certificate in Public Leadership for completion of Woman and Power Program (May, 2015),

Leadership Decision Making Program (February, 2019), Crisis Leadership in Higher Education Program

(March, 2019), John F. Kennedy School at Harvard University, Executive Education.

FELLOWSHIPS AND HONORS

Philip C. Hamm Memorial Lectureship in Plant Sciences, University of Minnesota (2014)

60th Anniversary of the National Science Foundation Graduate Research Fellowship Program Awardee profile -

https://www.nsfgrfp.org/general_resources/60th_anniversary/awardees (2013)

American Association for the Advancement of Science (AAAS) *Science* Prize for Inquiry Based Instruction (2013)

Charles Edwin Bessey Award, Botanical Society of America (2011)

AAAS Fellow (elected in 2009)

Excellence in Teaching Award, American Society of Plant Biologists (2004)

National Science Foundation (NSF) [Graduate Research Fellowship](#) (1981-1984)

National Institutes of Health (NIH) Training Grant Fellowship, Woods Hole (summer 1983)

Rensselaer Scholar Fellowship (1981-1982)

Class of 1902 Prize for best senior thesis at Rensselaer Polytechnic Institute (1981)

EXTERNAL BOARDS AND COMMITTEES

Board on Life Science, National Academies of Science, Engineering, and Medicine (2018-present)

Roundtable on Systemic Change in Undergraduate STEM Education, National Academies of Science, Engineering, and Medicine, Board on Science Education (2017-present)

Organizing Committee, Global Perspectives in Convergence Education, convened by National Science Foundation, Organization for Economic Co-operation and Development, U.S. National Academies of Science, Engineering, and Medicine, U.S. Department of State, University of Southern California (2017-2018)

Chair (elected position), AAAS Section Q, Education (chair elect, 2017, chair 2018, past-chair 2019)

Orlando Science Center Board – (2017-present), <https://www.osc.org>

NSF, NIH, Howard Hughes Medical Institute Partnership in Undergraduate Life Sciences Education (PULSE) Fellows Mentor <http://www.pulsecommunity.org/page/about> (2012-present)

Biological Sciences Curriculum Study Board of Directors – (2012-2013)

Botanical Society of America Board of Directors (elected position) – (2012-2013)

National Research Council (NRC) [Discipline-based Education Research Practitioner Resource Committee](#) – (2012-2013)

Member at large (elected position), AAAS Section Q, Education - (2011-2014)

Minnesota Next Generation Science Standards Committee <http://www.nextgenscience.org/Minnesota> - (2011-present)

College Board Advanced Placement (AP) Labs Vision Committee (2010-2011)

Chair, NRC Committee on Discipline Based Education Research (2010-2012)

http://sites.nationalacademies.org/DBASSE/BOSE/Discipline_Based_Education_Research/index.htm

Center for Excellence in Education Board of Directors (2010-2012)

Legume Information Services Advisory Board (2010-present)

NRC Committee on Education on Dual Use Issues in the Life Sciences (2009-2010)

American Society of Plant Biologists Education Foundation Board (2009- 2014)

NSF Education and Human Resources Advisory Committee (2009-present)

NRC Board on Science Education (2004-2011) <http://sites.nationalacademies.org/DBASSE/BOSE/index.htm>

iPlant Collaborative Advisory Board and chair of Education, Outreach and Training Committee (2008-2013, group shifted to a full working group in 2011) <http://iplantcollaborative.org/>

Chair, NRC committee on Evidence on Selected Promising Practices in Undergraduate Science, Technology, Engineering, and Mathematics (STEM) Education (2007-2008)

http://sites.nationalacademies.org/DBASSE/BOSE/DBASSE_072106

Teaching Genomics Consortium (2006-present) <http://serc.carleton.edu/genomics/>

NRC Learning Science Kindergarten through Eighth Grade Science Consultant (*Taking Science to School*)

http://sites.nationalacademies.org/DBASSE/BOSE/DBASSE_071183

Chair, NRC High School Science Laboratories: Role and Vision Committee

http://sites.nationalacademies.org/DBASSE/BOSE/DBASSE_072067

Project Kaleidoscope Board of Directors (2005-2009) <http://pkal.org/>

PKAL National Steering Committee (2002-2005)

Columbia University Genomes and Undergraduates: Science as Inquiry Initiative Steering Committee (2004-2007)

Planting Science teacher and student mentoring program advisory board (2005-2008) - <http://plantingscience.org/>

Society for Developmental Biology review committee for the BioScieEd Net NSDL portal

<http://www.biosciednet.org/portal/> (2003-2007)

Chair, NSF Committee of Visitors for review of the Plant Genome Program (2004)

http://www.nsf.gov/od/oia/activities/cov/bio/2004/BIO_PG2004COV.pdf

NRC Committee on Undergraduate Science Education (2002-2004)

Core member of NSF Research Coordination Network: Molecular and Organismic Research in Plant History (P.I. Ned Friedman, University of Colorado, \$498,128, 2003-2008) <http://www.colorado.edu/eeb/MORPH/>

PKAL Task Force on Evaluation and Assessment (2002-2004)

Society for Developmental Biology Professional Development and Education Committee (1997-2002)

American Society of Plant Biologists Education Committee (member 1989-1995, Chair 1992-1995)

Coalition of Educators in the Life Sciences (CELS) board (member 1994-1999, Chair 1998-1999)

Coalition for Education about Environment, Food, Agriculture and Renewable Resources (CEEFAAR) Steering Committee member (1994-1996)

RESEARCH GRANTS

- NSF (DUE-1725320) - \$1,798,710 Using Networks to Scale Improvement of STEM Undergraduate Education: A Comparative Study of Network Goals, Processes, and Strategies to Advance Organizational Change under the direction of Ann Austin (Michigan State) and Susan Rundell Singer (8/15/2017-7/31/2021)
- Mellon Foundation - \$800,000 Implementing Rollins Foundations in the Liberal Arts (rFLA): A New Model of General Education (1/2016-12/2020)
- NSF (DUE/EHR) - Intergovernmental Personal Act award included Independent Research and Development funding for research on scaffolding genomics learning (1/2013 – 7/2016)
- NSF (DUE-0837375) - \$149,976 Scaffolding Conceptually Driven Genomics Education (12/08-11/11)
- NSF (DEB-0746571) - \$200,000 Big Science at Small Schools Collaboration: Genomics of *Chamaecrista fasciculata*, a native prairie plant with potential for mixed prairie biomass (9/07-6/09)
- NSF (IBN-0422840)-\$390,000 Shoot Architecture- A Systems Approach in Pea (7/04-6/09)
- Teagle Foundation – \$97,000 “Bringing Big Science to Small Colleges: A Genomics Collaboration” (April 2007- July 2010) [collaborative with colleagues at Williams, Vassar, and Barnard; Lois Banta, project director]
- Core member of NSF RCN (DEB 0234008) Molecular and Organismic Research in Plant History \$498,128 (3/03-1/08), PI - Ned Friedman, University of Colorado, Boulder
- NSF (IBN/BIO) - Intergovernmental Personal Act award included Independent Research and Development funding for research on inflorescence architecture (8/1999 – 8/2001)
- NSF (IBN-9977087) - \$331,767, "Research at Undergraduate Institutions (RUI): Regulation of Inflorescence Architecture in Pea (8/99-10/04) with Research Experiences for Undergraduates (REU) supplements: \$10,000 (8/00) and \$10,800 (8/02)
- NSF - (DUE-9550097) - \$7,200 for Plant Biology Education Publication Workshop for the American Society of Plant Physiologists (12/94 - 3/95) – The journal *Plant Physiology* now publishes education articles as a result of this effort.
- NSF-REU (SBE) - \$44,500 to investigate "Acquiring, Organizing, and Using Knowledge" (5/95 - 12/96) with K. Galotti (cognitive psychologist, Dept. of Psychology, Carleton College)
- NSF (IBN-9405799) - \$215,000, "RUI: Specification of Meristem Identity in Pea Inflorescences" (7/94 - 8/99)
- USDA (9103136) - \$90,000 to investigate "Inflorescence Development in *Pisum sativum*" (9/91 - 8/94)
- NSF-REU (DIR - 9100846) - \$85,700 for "Undergraduate Research in Developmental Regulation" (6/91 - 11/93)
- USDA (9037615516) - \$32,000 for "Regulation of Floral Development in *Pisum sativum*" (9/90 - 8/92)
- NSF-REU (DIR - 9000810) - \$41,850 for "Undergraduate Research in Developmental Regulation" (6/90 - 11/91)
- Society for Developmental Biology - \$3,100 for Plant Development Lab Collection (1990)
- NSF-REU (DIR-8900679) - \$39,850 for "Undergraduate Research in Developmental Regulation" (6/89 - 11/90)
- NSF-REU (BBS-8803871) - \$36,000 for "Undergraduate Research in Developmental Regulation" (5/88 - 10/89) USDA (87-CRRC-1-2554): \$145,000 total to study "Acquisition of Competence for Floral Determination" (9/87 - 8/91)
- William and Flora Hewlett Foundation Grant of Research Corporation: \$19,400 total to study "Competence: A Prerequisite for Floral Determination" (7/1/87 - 6/30/89)
- NSF Pre-Doctoral Fellowship (1981-1984)

Carleton grants

- Carleton Faculty Development Grant - \$3000 to study Origins of *Chamaecrista fasciculata* in McKnight Prairie (2011)
- Carleton Targeted Opportunity Grant – 3 course releases to shift research focus to *Chamaecrista* (2007-2009)
- Mellon New Directions Fellowship – One term of leave and \$5000 to study Mathematical Modeling of Inflorescence Architecture (12/03-4/04)
- Carleton Program in Ethical Reflections Curricular Development Grant – Bioethics in Introductory Biology (summer 2003)
- Carleton Mellon Lifecycle Co-mentoring Grant with Debby Walser-Kuntz – Active Learning in Introductory Biology (2002)
- Carleton Curricular Computing Grant – 3D digital image capture and analysis to enhance 3D visualization in biology, art, and archeology (2002)
- Carleton Curricular Computing Grant – Using laptops for data acquisition and analysis in the field (1996)
- Carleton Faculty Development Grant for Research - one term course release (Spring 1991)
- Carleton Faculty Development Award for Research- \$2,000 (summer 1987), \$2500 (summer 1999)

PUBLICATIONS (student authors are underlined)

Journal articles

- Bueno, E., S. Maki, S. T. Kisha, E. von Wettburk, S. Singer. Genetic diversity of *Chamaecrista fasciculata* (Fabaceae) from the USDA germplasm collection. BMC notes, submitted.
- Singer, S.R., J.A. Schwarz, C.A. Manduca, S.P. Fox, E.R. Iverson, B.J. Taylor, S.B. Cannon, G.D. May, S.L. Maki, A.D. Farmer, J.J. Doyle (2013) [Keeping an eye on biology](#). *Science* 339: 408-409
- Young, N.D. et al. (2011) [The Medicago genome provides insight into the evolution of rhizobial symbioses](#). *Nature*: 480: 520-524
- Cannon, S.B., D. Illut, A.D. Farmer, S.L. Maki, G.D. May, S.R. Singer, J.J. Doyle (2010) [Nodule evolution did not depend on early polyploidy in the legumes](#). *PLoS ONE*, 5(7): e11630. doi:10.1371/journal.pone.0011630
- Singer, S.R., S.L. Maki, A.D. Farmer, D. Illut, G.D. May, S.B. Cannon, and J.J. Doyle (2009) [Venturing beyond beans and peas – What can we learn from Chamaecrista?](#) *Plant Physiology* 151: 1041-1047
- Deel, S., S. Singer, and D. Walser-Kuntz. (2009) Human single nucleotide polymorphism (SNP) Determination. Pages 65-94, in *Tested Studies for Laboratory Teaching*, Volume 31 (K. Clase, Editor). *Proceedings of the 31st Workshop/Conference of the Association for Biology Laboratory Education (ABLE)*
- Maki, S.L., H. Mullen, R. Pharis, and S. Singer (2005) Improvement of yield in greenhouse grown determinate multiflowered peas with gibberellin treatments. *Proceedings of the thirty-second annual meeting of the Plant Growth Regulation Society of America* held July 24-27 in Newport Beach, CA. pp. 108-120.
- Beveridge, C.A., James L. Weller, Susan R. Singer, and Julie M.I. Hofer (2003) [Axillary meristem development, budding relationships between networks controlling flowering, branching, and photoperiod responsiveness](#). *Plant Physiology* 131: 927-934.
- Taylor, S., J. Hofer, I. Murfet, J. Sollinger, S. Singer, M. Knox, N. Ellis (2002) [PROLIFERATING INFLORESCENCE MERISTEM, a MADS-box gene that regulates floral meristem identity in pea](#). *Plant Physiology* 129: 1150-1159
- Galotti, K.M., R.O. Elveton, L.K. Komatsu, M.S. Rand, S.R. Singer (2000) Origins and mind: An integrated academic experience for new students. *Liberal Education* 86:32-39
- Singer, S., J. Sollinger, S. Maki, J. Fishbach, B. Short, C. Reinke, J. Fick, Laura Cox, A. McCall and H. Mullen. (1999) Inflorescence architecture: a developmental genetics approach. *Botanical Review* 65:385-410
- Reid, J.B., I.C. Murfet, S.R. Singer, J.L. Weller, S.A. Taylor (1996) Physiological-genetics of flowering in *Pisum*. *Seminars in Cell and Developmental Biology* 7:455-463
- Singer, S.R., S.L. Maki, H.J. Mullen (1994) Specification of meristem identity in *Pisum sativum* inflorescence development. *Flowering* 18: 26-42
- McDaniel, C.N., S.R. Singer, S.M.E. Smith (1992) Developmental states associated with the floral transition. *Developmental Biology* 153:59-69
- Singer, S.R., C.H. Hannon, S.C. Huber, (1992) Acquisition of competence for floral determination in shoot apices of *Nicotiana*. *Planta*, 188:546-550
- Singer, S.R. (1992) Floral morphogenesis in *lythrum*. In: S.R. Singer, editor. *Plant Development Lab Collection*. Society for Developmental Biology, Washington, D.C.
- Ferguson, C.J., S.C. Huber, Hong, P.H., S.R. Singer (1991) Determination for inflorescence development is a stable state, separable from determination for flower development in *Pisum sativum* buds. *Planta* 185: 518-522
- Singer, S.R., L. Hsiung, S.C. Huber (1990) The determinate (*det*) mutant of *Pisum sativum* L. (leguminosae: papilionoidae) exhibits an indeterminate growth pattern. *American Journal of Botany* 77: 1330-1335
- McDaniel, C.N., K.A. Sangrey, S.R. Singer (1989) Node counting in axillary buds of *Nicotiana tabacum* L. cv. Wisconsin 38, a dayneutral plant. *American Journal of Botany* 76: 403-408
- Singer, S.R., C.N. McDaniel (1987) Floral determination in internode tissues of dayneutral tobacco first occurs many nodes below the apex. L., *Proceedings of the National Academy of Science, USA* 84:2790-2792
- Singer, S.R., C.N. McDaniel (1986) Floral determination in the terminal and axillary meristems of *Nicotiana tabacum* L. *Developmental Biology* 118:587-592
- Singer, S.R., C.N. McDaniel (1986) Analyzing growth in cell cultures: II. Effect of initial cell mass on growth. *Canadian Journal of Botany* 64: 238-241
- Singer, S.R. (1986) Analyzing growth in cell cultures: I. Calculating growth rates. *Canadian Journal of Botany* 64: 233-237
- Singer, S.R., C.N. McDaniel (1985) Selection of glyphosate-tolerant tobacco calli and the expression of this tolerance in regenerated plants. *Plant Physiology* 78: 411-416
- Singer, S.R., C.N. McDaniel (1984) Selection of amitrole tolerant tobacco calli and the expression of this tolerance in regenerated plants and progeny. *Theoretical and Applied Genetics* 67: 427-432

Singer, S.R., C.N. McDaniel (1982) Transport of the herbicide 3-amino-1,2,4-triazole by cultured tobacco cells and leaf protoplasts. *Plant Physiology* 69: 1382-1386 (my undergraduate research)

Books

- Mason, K. J. Losos, J. and S. Singer (2016) [*Biology 11th edition*](#), New York: McGraw-Hill
- Mason, K., G. Johnson, S. Singer, and J. Losos (2015) [*Understanding Biology*](#), New York: McGraw-Hill
- Mason, K. J. Losos, J. and S. Singer (2014) [*Biology 10th edition*](#), New York: McGraw-Hill
- Singer, S.R., N. R. Nielsen, and H.A. Schweingruber (2012) [*Discipline-based Education Research: Understanding and Improving Learning in Undergraduate Science and Education*](#), Washington, DC: National Academies Press
- National Research Council (2011) [*Promising Practices in Undergraduate Science, Technology, Engineering, and Mathematics Education*](#), Washington, DC: National Academies Press (S.R. Singer was committee chair)
- Losos, J., K. Mason, and S. Singer (2011) [*Biology 9th edition*](#), New York: McGraw-Hill
- National Research Council (2010) [*Challenges and Opportunities for Education About Dual Use Issues in the Life Sciences*](#), Washington, DC: National Academies Press (S.R. Singer was study committee member and report author)
- National Research Council (2009) [*Transforming Agricultural Education for a Changing World*](#), Washington, DC: National Academies Press (S.R. Singer was study committee member and report author)
- Raven, P., G. Johnson, J. Losos, K. Mason and S. Singer (2008) [*Biology 8th edition*](#), New York: McGraw-Hill
- Singer, S.R., Hilton, M. L., Schweingruber, H. A. (eds.) (2005) [*America's Lab Report: Investigations in High School Science*](#), Washington, DC: National Academies Press
- Singer, S.R. and C. Rutz (eds.) 2004 [*Reflections on Learning as Teachers*](#), Northfield, MN: College City Publications
- Raven, P., G. Johnson, J. Losos, S. Singer (2005) [*Biology 7th edition*](#), New York: McGraw-Hill
- NRC CUSE Steering Committee 2003 [*Improving Undergraduate Instruction in Science, Technology, Engineering, and Mathematics: Report of a Workshop*](#). R.A. McCray, R.L. DeHaan, J.A. Schuck (eds). Washington, D.C.: National Academy Press (S. Singer was steering committee member), <http://books.nap.edu/catalog/10024.html>
- Singer, S.R. (ed.) 1992 [*Plant Developmental Biology Laboratory Collection*](#), Washington, D.C.: Society for Developmental Biology

Reviews, reports, and book chapters

- James, S.M. and S.R. Singer (2016) [*From the NSF: The National Science Foundation's Investments in Broadening Participation in Science, Technology, Engineering, and Mathematics Education through Research and Capacity Building*](#), CBE-Life Sciences Education, 17:fe7, 1-8
- Singer, S.R. (2015) [*Partnering to advance learning in a technology-enhanced world*](#), *EDCUASE Review*. 50 (2)
- Singer, S. (2015) Implementing Evidence-based Undergraduate STEM Teaching Practice. In: Shelton, R.N. and H.R. Rawlings, III (eds.) [*Searching for Better Approaches: Effective Evaluation of Teaching and Learning in STEM*](#), Tucson, AZ: Research Corporation for the Advancement of Science, pp. 1-5
- Ferrini-Mundy, J., L. Scherer, and S.R. Singer (2015) [*The Reform of Undergraduate Science, Technology, Engineering, and Mathematics Education in Context: Preparing Tomorrow's STEM Professionals and Educating a STEM-Savvy Public*](#). Indiana: Purdue University Press
- Singer, S.R. (2015) Learning in a world of convergence. In: Bainbridge, W.S and M.C. Roco (eds.) [*Handbook of Science and Technology Convergence*](#), Springer, DOI 10.1007/978-3-319-04033-2_63-1
- Singer, S.R. (2013) [*Advancing research on undergraduate science learning*](#). *Journal of Research in Science Teaching*. 50: 768-772
- Bonvillian, W.B. and S.R. Singer (2013) [*The online challenge to higher education*](#). *Issues in Science and Technology*. 29 (4)
- Singer, S.R. and W.B. Bonvillian (2013) [*Two revolutions in learning*](#). *Science*. 339: 1359
- Singer, S. and K. A. Smith (2013) [*Discipline-based education research: Understanding and improving learning in undergraduate science and engineering*](#). *Journal of Engineering Education*. 102: 468-471, DOI: 10.1002/jee.2003
- Singer, S. and K. Smith (2013) [*Follow the evidence: Discipline-based education research dispels myths about learning and yields results – if only educators would use it*](#). PRISM
- Singer, S.R. N.R. Nielsen, and H.A. Schweingruber (2013) [*Biology education research: lessons and future directions*](#). CBE – Life Science Education. 12: 129-132
- Banta, L.M., E.J. Crespi, R.H. Nehm, J.A. Schwarz, S. Singer, C. Manduca, et al. (2012) [*Integrating genomics research throughout the undergraduate curriculum: a collection of inquiry-based genomics lab modules*](#). CBE - Life Science Education. 11: 203-208
- Moon, J. and S.R. Singer (2012) [*Bringing STEM into focus*](#). Ed Week, January 30, 2012
- Singer, S.R. (2011) [*STEM education: Time for integration*](#). Peer Review 13 (3): 4-7.

- Bauerle, C., A. DePass, D. Lynn, C. O'Connor, S. Singer, and M. Withers (2011) [Vision and Change in Undergraduate Biology Education: A Call to Action](#). C. Brewer and D. Smith (eds.). Washington, DC: AAAS
- Labov, J.B., S.R. Singer, M.D. George, H.A. Schweingruber, and M.L. Hilton (2009) [Effective practices in undergraduate STEM education part 1: Examining the evidence](#). CBE – Life Sciences Education. 8:157-161
- Banta, L., Crespi, E, Manduca, C., Nehm, R., Schwarz, J., and Singer, S.R. (2009) [Big science at small colleges: A collaborative model for genomics curriculum development at liberal arts colleges](#). Teagle Foundation paper
- Reinke, C.A., and S.R. Singer (2006) From Observers to Participants: joining the scientific community. In Building Collaborations. C. Rutz and M. Savina (eds.), Northfield, MN, College City Publications,
- Singer, S.R. (2006) Overview of Plant Development. In: S. F. Gilbert. Developmental Biology (8th edition). Sunderland, MA: Sinauer Associates
- Singer, S. R. (2006) Everything Old is New Again: Circularity and Singularity in Science as a Liberal Art. *Journal of the Liberal Arts* 4: 71-80
- Singer, S.R. (2006) Inflorescence Architecture. In Genetic Regulation of Flowering. C. Ainsworth, ed. Blackworth, Inc., London, pp. 98-113.
- Singer, S.R., Hilton, M. L., Schweingruber, H. A. (2005) Needing a new approach to science labs. *The Science Teacher*. 72 (7): 10
- Walser-Kuntz, D. Deel, S., Singer, S. (2005) [“SNPs and snails and puppy dog tails, and that’s what people are made of …” A Case Study on Genome Privacy](#). The National Center for Case Study Teaching in Science Case Collection, SUNY Buffalo.
- Walser-Kuntz, D, Singer, S., Deel, S. (2005) Closing the Gap in Introductory Biology Learning: Effect of Problem Solving Sessions." Proceedings of the Innovations in Scholarship of Teaching and Learning at the Liberal Arts Colleges, St. Olaf College, Northfield, MN
- Singer, S.R. (2004) Talking about teaching: the importance of colleagues. In Reflections on Learning as Teachers. S. R. Singer, and C. Rutz (eds.) College City Publications, Northfield, MN, pp 5-13
- Singer, S.R. (2003) Overview of plant development. In Developmental Biology (7th edition) by S.F. Gilbert, Sinauer Associates, Sunderland, MA
- Singer, S. R. (2002) Learning and teaching centers: Hubs of educational reform. In Building Robust Learning Environments in Undergraduate Science, Technology, Engineering, and Mathematics. J. L. Narum and K. Conover (eds), pp. 59-64, Jossey-Bass, San Francisco
- Singer, S.R. (contributing author) (2001) Plant chapters, In Biology (6th edition), McGraw-Hill, New York, N.Y.
- Plesset, J., S. Scheiner, S. Singer (2001) Evolution and Development at the National Science Foundation, USA. *Evolution and Development* 3: 1-2
- Plesset, J., S. Scheiner, S. Singer (2000) Evolution and Development at the National Science Foundation, USA. *Genesis* 28: 45-46
- Plesset, J., S. Scheiner, S. Singer (2000) Evolution and Development at the National Science Foundation, USA. *Journal of Experimental Zoology* 288: 285-286
- Singer, S.R. (2000) Plant Development, In Developmental Biology (6th edition) by S.F. Gilbert, Sinauer Associates, Sunderland, M.A.
- CELS (1998) Professional Societies and the Faculty Scholar: Promoting Scholarship and Learning in the Life Sciences. L. Liao (ed.). with R. Bloodgood, J.R. Jungck, and S.R. Singer (monograph advisors), Madison, W.I.
- Singer, S. (1997) Arms and Camp’s Biology: Though it has some faults, this is a solid biology text. *The Textbook Letter* 8: 3-4
- Singer, S.R. (1997) Plant Life Cycles and Angiosperm Development. In Embryology: Constructing the Organism, S.F. Gilbert and A.M. Raunio, eds., pp. 493-513, Sinauer Associates, Sunderland, M.A.
- Singer, S.R. (1991) Flowering regulation. In McGill's Survey of Science: Life Sciences, Salem Press, pp.1010-1016
- Singer, S.R. (1991) Homeotic genes and homeoboxes. In McGill's Survey of Science: Life Sciences, Salem Press, pp. 1314-1320
- McDaniel, C.N., S.R. Singer, J.S. Gebhardt (1987) Developmental patterns of floral induction in tobacco. In UCLA Symposium on Molecular and Cellular Biology, Plant Gene Systems and their Biology, J.L. Key and L. McIntosh (eds.), pp. 39-52
- McDaniel, C.N., S.R. Singer, J.S. Gebhardt, K.A. Dennin (1986) Floral determination: A critical process in meristem ontogeny. In: The Manipulation of Flowering, J.G. Atherton (ed.), pp. 109-120
- McDaniel, C.N., S.R. Singer, K.A. Dennin, J.S. Gebhardt (1985) Floral determination: timing, stability and root influence. In UCLA Symposia on Molecular and Cellular Biology, Plant Genetics, M. Freeling (ed.), pp. 73-88
- McDaniel, C.N., S.R. Singer (1982) Mutant selection in tobacco. *Plant Molec. Bio. News*. 3: 67-72

Other media

- Singer, S.R. and C. Fuleihan Intersection: Millennium Fellows Work Towards Sustainable Goals, WMFE Orlando (<http://www.wmfe.org/intersection-millennium-fellows-work-towards-sustainable-goals/90660>)
- Singer, S.R. Catalyzing Advances in Undergraduate STEM Education - epiSTEME-7 - Seventh international conference to review research on Science, Technology and Mathematics Education in Mumbai, India, (https://www.youtube.com/watch?v=_4wES9nM7Y4&index=1&list=PLyQwaGYZFhmxPxrJTrN_pqmvQ9BkcUCDX&t=24s)
- Singer, S.R., and others, Developing Indicators for Undergraduate STEM Education - http://sites.nationalacademies.org/DBASSE/BOSE/DBASSE_174122
- Singer, S.R., and others, [Reaching Students webinar](#)
- Singer, S.R., “[A Conversation between Susan Singer and Harvard Science Faculty about Improving Undergraduate Science Education](#)”
- Singer, S.R., Science Live Chat with Hal Saltzman and Jeff Mervis on [The Making \(or Breaking\) of a STEM major](#)
- Singer, S.R., guest on [NPR's Science Friday](#)
- [Video of Discipline-Based Education Research Report Release Event](#) on 11/8/12 (Committee chair and event moderator)
- Teaching Tips (2017)
- [Challenging Non-Traditional Students](#)
 - [Set Style and Formatting in Context](#)
 - [Working with Evidence](#)
 - [Community in Science](#)

Websites

- “Exploring the *Chamaecrista* Gene Space” (2011) – serc.carleton.edu/genomics/units/33519.html and serc.carleton.edu/exploring_genomics/chamaecrista/index.html
- “Faculty-coached, In Class Problem Solving” (2009) - serc.carleton.edu/sp/library/coached_problems/index.html
- “Big Science at Small Schools.” Teaching and Assessing Genomics Consortium (2006-present) - <http://serc.carleton.edu/genomics/>
- “Human Single Nucleotide Polymorphism Determination” (2006) - serc.carleton.edu/genomics/units/snp.html
- “Reconstructing the Evolution of Cauliflower and Broccoli” (2006) - serc.carleton.edu/genomics/units/cauliflower.html
- “SNPs and snails and puppy dog tails, and that’s what people are made of ...” A Case Study on Genome Privacy (2005). The National Center for Case Study Teaching in Science Case Collection, SUNY Buffalo. http://sciencecases.lib.buffalo.edu/cs/collection/detail.asp?case_id=337&id=337

INVITED PRESENTATIONS

- “Evidence-Based Research & Effective Learning Strategies,” Provost’s Symposium: Empowering Students to be Active Learners, University of Florida (February 2019)
- “Network and Disciplinary Organization Approaches for Advancing Skillful Teaching Practices,” panel presentation Strengthening Undergraduate Teaching meeting, American Academy of Arts and Sciences, Boston, MA (December 2018)
- “Undergraduate Field Experiences: Challenges and Opportunities” - Undergraduate Field Experiences Research Network (UFERN) Kickoff, University of Oregon (April 2018)
- “Collaboration and Innovation in STEM Education Research” – Inter-Institutional Collaboration, Blended and Active Learning in STEM Workshop, University of Central Florida (April 2018)
- “Leadership in Plant Biology” – American Society of Plant Biologists Convivon Scholars Program webinar (February 2018)
- “Role of Assessment of Intrapersonal and Interpersonal Competencies in Supporting a Holistic Approach to Undergraduate Education” – AAC&U, Washington, DC (January 2018)
- “Dean as Public Intellect” – AAC&U, Washington, DC (January 2018)
- “Catalyzing Advances in Undergraduate STEM Education” – epiSTEME: A Biennial Conference Series to Review Research on Science, Technology and Mathematics Education, Homi Bhabha Centre for Science Education, Tata Institute of Fundamental Research, Mumbai, India (January 2018)
- “Learning in a World of Convergence” – Global Perspectives in Convergence Education, State Department and National Academies of Science, Engineering, and Medicine, Washington, DC (November 2017)
- “Tipping to the New Normal in Undergraduate STEM Education” – AAU Presidents Meeting (October 2017)
- “Creating Inclusive Learning Environments” – Online Learning Summit, Cambridge, MA (September 2017)

- “Enhancing Undergraduate Learning through Research Experiences” – Department of Biology, University of Florida, Gainesville, FL (September 2017)
- “From Evidence-Based Research to Effective Strategies in Online Learning Design” – Distance Teaching and Learning Conference, Madison, WI (July 2017)
- “Tipping to the New Normal in Undergraduate Biology Education” – Gordon Research Conference on Undergraduate Biology Education Research, Easton MA (July 2017)
- “What’s Missing in Discipline-based Education Research?” – American Association for Education Research, San Antonio, TX (April 2017)
- “Creating a Culture of Student Success and Assessment in Liberal Arts Colleges: Role of Intra- and Interpersonal Competencies” -- Summit on Supporting Students’ College Success: The Role of Assessment of Intrapersonal and Interpersonal Competencies, National Academies of Science, Engineering, and Medicine, Washington, DC (April 2017)
- “Follow the Evidence: Improving STEM Learning for All” – Breaking the Boundaries of STEM Education Conference, Loyola Marymount University, Los Angeles, CA (April 2017)
- “[Research on Effective Undergraduate STEM: Implications for Policy and Funding](#)” – AAAS Symposium on [Using Evidence to Inform Policy for Undergraduate STEM Education](#), Boston, MA (February 2017)
- “Building the X-DBER Community” – APLU and AAAS X-DBER meeting keynote, Washington, DC (November 2016)
- “Charting Improvement in STEM Education – Role of NRC Undergraduate STEM Education Indicators Study” – Developing Indicators for Undergraduate STEM Education, National Academy of Science, Washington, DC (October 2016)
- “Advancing Discipline-based Education Research and Cognitive Science through Collaboration” – DBER meets Cognitive Science meeting, Washington, DC (September 2016)
- “Research and Innovation in Preservice STEM Teacher Development” - Summit on Stimulating Research and Innovation for Preservice Education of STEM Teachers in High-Need School, Washington, DC (July 2016)
- “Catalyzing Improvement in Undergraduate STEM Education” – SCAFRO Conference, Northfield, MN (July 2016)
- “Learning in a World of Convergence” – R&D Management Conference - From Science to Society: Innovation and Value Creation, Churchill College, Cambridge, UK (July 2016)
- “Federal STEM Education Plan: Updates on Undergraduate Progress” – National Academies of Science, Engineering, and Medicine’s Board on Science Education meeting, Washington, DC (June 2016)
- “Discipline-Specific STEM Education Research to Improve Preservice Teacher Development” – Identifying a Research Agenda for Preservice Education of STEM Teachers in High-Need Schools Conference, AAAS, Washington, DC (June 2016)
- “Enhancing Success of Undergraduate STEM Majors by Integrating Internship Experiences” – Graduate Research Internship Program Interagency Meeting, Arlington, VA (June 2016)
- “Improving Undergraduate STEM Education by Integrating Research & Practice” – University of California, Davis (May 2016)
- “Improving STEM Education through Data-intensive Research” – American Educational Research Association, Washington, DC (April 2016)
- “Barriers and Opportunities for 2-Year and 4-Year STEM Degrees,” panel chair - American Educational Research Association, Washington, DC (April 2016)
- “Improving Undergraduate STEM Education by Integrating Research & Practice” – Temple University, Philadelphia, PA (April 2016)
- “Improving STEM Education through Data-intensive Research” – National Academy of Science, Washington, DC (April 2016)
- “Learning in a Changing World” – Designing Places for Inventing the Future, MIT, Cambridge, MA (March 2016)
- “Lessons from Postsecondary Reform in Other STEM Disciplines for the Mathematics Community” – Transforming Postsecondary STEM Education: Mathematics Workshop, Washington, DC (March 2016)
- “Learning in a World of Convergence” – Convergence: The Future of Health Workshop, AAAS, Washington, DC (March 2016)
- “NSF Perspective on Developing a T-Shaped Workforce” – T-Summit, Washington, DC (March 2016)
- “Flowering on the Prairie: Gene x Environment Interactions in *Chamaecrista fasciculata*” – Rollins College, Winter Park, FL (March 2016)
- “Growing the Next Generation of STEM Talent – Perspectives from NSF” – Fifth Annual UGA STEM Institute on Teaching and Learning, Athens, GA (February 2016)

- "The Funding Landscape - why do NSF and private foundations care about the complex system of education?" – Complex Systems in Education Symposium, Georgia Tech, Atlanta, GA (February 2016)
- "Imagine the Possibilities: Data Analytics, Change Management and Intervention Measurement" – Predictive Analytics Research Conference, Tempe, AZ (February 2016)
- "Integrating Research and Practice to Improve Undergraduate STEM Education" – Florida International University, Miami, FL (February 2016)
- "Understanding and Measuring Intrapersonal and Interpersonal Competencies at the NSF" – National Academies of Science Summit on Cognitive, Intrapersonal, and Interpersonal Competencies, Washington, DC (December 2015)
- "Institutional Transformation in Higher Education" – Colleges of Liberal Arts Sponsored Programs (CLASP) Conference, Clinton, NY (November 2015)
- "Creating STEM Learning Environments that Support Student Success" – STEMTech Conference, Phoenix, AZ (November 2015)
- "Institutional Transformation: Why the urgency?" – Independent Colleges Office annual meeting, Washington, DC (October 2015)
- "From Legume Genetics to Genomics in Undergraduate Education" – Research in Plant Genetics Conference, Brno, Czech Republic (September 2015)
- "Applying Learning Science Research to Distance Education Practice" – Distance Teaching and Learning Conference, Madison, WI (August 2015)
- "Accelerating Improvement of Undergraduate STEM Education with Assessment" – Ecological Society of America, Baltimore, MD (August 2015)
- "Leading Change, Building Coalitions" – Society for Experimental Biology, Prague, Czech Republic (July 2015)
- "From Vision to Change in Undergraduate Education: Spreading Effective Practices" – Society for Experimental Biology, Prague, Czech Republic (June 2015)
- "Accelerating Improvement in STEM Education Across U.S. Federal Agencies" - Pacific Postsecondary Education Council, U.S. Department of Education, Washington, DC (June 2015)
- "Accelerating Improvement in STEM Learning in Higher Education" – Association of Public and Land Grant Universities Science and Math Teachers Imperative National Conference, New Orleans, LA (June 2015)
- "Learning from Plant Genomics" – Data Intensive Research in Education, Washington, DC (June 2015)
- "Empowering Knowledge Networks for Lifelong Learning" – Future Learning 2020 Summit, Stanford, Palo Alto, CA (May 2015)
- "Imagine the Possibilities in a Digital World" – MIT Learning Science and Online Learning Symposium, Boston, MA (May 2015)
- "Improving Undergraduate Science, Technology, Engineering, and Mathematics (STEM) Education" – Harvard Initiative for Learning and Teaching, Cambridge, MA (May 2015, video at <http://hilt.harvard.edu/susansinger>)
- "Replacing Fossil Fuels: How do Biofuels Stack Up?" – Koshland Science Museum, Washington, DC (March 2015)
- "Learning Online and Learning Sciences" panel presentation – American Council on Education annual meeting, Washington, DC (March 2015)
- T-Summit panel presentation with Jeff Selingo, author of *College (Un)Bound* – Michigan State University, East Lansing, MI (March 2015)
- "Vision and Change in Undergraduate STEM Education" – University of Arizona, Tucson, AZ (March 2015, <https://uanews.arizona.edu/story/nsf-division-director-sizes-up-ua-s-stem-initiatives>)
- "Improving STEM Education for All Students" – U.C. Santa Barbara, CA (March 2015)
- "Going Public: Science Communications for Scientists at the NSF" - AAAS, San Jose, CA (February 2015)
- "Preparing Next Generation Quantitative Biologists" – AAAS, San Jose, CA (February 2015)
- "Mathematics Learning: Gateway, Not Gatekeeper, to STEM Learning" – Association of Mathematics Teacher Educators Annual Meeting, Orlando, FL (February 2015)
- "Growing a STEM Savvy Workforce" – Biophysical Society Annual Meeting, Baltimore, MD (February 2015)
- "Vision and Change in STEM Undergraduate Education" – James Madison University, Harrisonburg, VA (February 2015)
- "Describing and Measuring Instructional Practices in Undergraduate STEM Education" - Instructional Measurement in Higher Education, Spencer Foundation, Chicago, IL (November 2014)
- "Challenges and Opportunities in Undergraduate Biology Education Research" - National Academy of Education annual meeting, Washington, DC (November 2014)
- "The Science of Learning and Pedagogical Innovation in STEM Disciplines" - Reinventions Center's Engaged Learning and the Ethos of Discovery Conference. Arlington, VA (November 2014)

- “Preparing the STEM Workforce of Tomorrow” - American Council for Technology/Industry Advisory Committee, Washington, DC (November 2014)
- “Transforming STEM Education: Research on STEM Teaching and Learning” - PKAL 25th Anniversary Conference closing plenary, Atlanta, GA (November 2014)
- “Integrating and Aligning STEM Education K-16” - Terra Science Conference, Syracuse, NY (October 2014)
- “Improving Life Science Learning K-16” - Life Discovery conference, San Jose, CA (October 2014)
- “Research and Practice: Improving STEM Education” - Independent Colleges Office annual meeting, Washington, DC (October 2014)
- “Learning about Learning” - National Academies Committee on Science, Engineering, and Public Policy, Washington, DC (September 2014)
- “Progress in STEM Education Innovation” - White House College Opportunity Regional Workshop keynote panelist, University of Colorado, Boulder (September 2014)
- “From Research to Action: Improving Undergraduate STEM Education” - Penn State (September 2014)
- “Learning about Learning in a Technology-enabled World” - Learning with MOOCs conference keynote, Boston, MA (August 2014)
- “Learning through Authentic Experiences” - SENCER keynote, Asheville, NC (August 2014)
- “A New Biology Education for the 21st Century” - Evolution meetings, Raleigh, NC (June 2014)
- “Impact of the Discipline-based Education Research Report” - NRC Board on Science Education 10th anniversary celebration, Washington, DC (June 2014)
- “Research and Practice: Improving Undergraduate STEM Education” - CASE Corporate and Foundations Research Conference, Chicago (June 2014)
- “Creating Learning Environments for Future STEM Teachers” - PhysTEC conference keynote, Austin, TX (May 2014)
- “Advanced Manufacturing Workforce of Tomorrow” - Advanced Manufacturing Partnership Regional Meeting, Cambridge, MA (May 2014)
- “Flowering on the Prairie: Gene x Environment Interactions in *Chamaecrista fasciculata*” - University of Minnesota, Philip C. Hamm Lecture, St Paul, MN (April 2014, <http://www.cbs.umn.edu/blogs/cbs-connect/2014-hamm>)
- “From Research to Practice: Improving Undergraduate STEM Education” - Keck/PKAL STEM Effectiveness Framework keynote, Sacramento, CA (April 2014)
- “From Research to Action: Improving Undergraduate STEM Education” - University of Wisconsin, Madison (April 2014)
- “Improving Undergraduate STEM Education – Federal Perspective” - American Education Research Association, Philadelphia (April 2014) [Symposium on Linking Theory, Research, and Practice to Improve STEM Undergraduate Education, organized by Ann Austin and Susan Singer]
- “Developing the Advanced Manufacturing Workforce” - American Society of Mechanical Engineers Industry Advisory Board meeting, Washington, DC (April 2014)
- “Improving Undergraduate STEM Education One STEP at a Time” - STEP 2014, Washington, DC (March 2014)
- “From Research to Action: Improving Undergraduate STEM Education” - Michigan State University (February 2014)
- “Developing the Advanced Manufacturing Workforce” - Organizing the Innovation System for Advanced Manufacturing Symposium at AAAS, Chicago, IL (February 2014)
- “Investing in Improving Undergraduate STEM Education” - Interagency Coordinating Committee on Ceramics Research and Development, Washington, DC (February 2014)
- “Implementing Evidence-based Undergraduate STEM Teaching Practices” - Cottrell Science Scholars meeting, AAU, Washington, DC (January 2014)
- “Learning about Learning in a Technology-enabled World” - National Academies Committee on Science, Engineering, and Public Policy, Washington, DC (December 2013)
- “Technology-Enhanced Education and Advanced Manufacturing” – Evaluating the Implications of the MIT Final Report on Advanced Manufacturing, National Academies, Washington, DC (November 2013)
- “Developing the Advanced Manufacturing Workforce” – ASME/APLU Federal Agency Updated on Manufacturing Initiatives, Washington, DC (September 2013)
- Learning Engineers and Undergraduate STEM Education Reform” – University of Maine, Orono (September 2013)
- “Convergence at Liberal Arts Colleges” – Key Challenges for Convergence and Health Workshop, National Academy of Science, Washington, DC (September 2013)
- “Education for Innovation in Advanced Manufacturing” – Producing in an Innovation Economy Conference, MIT, Boston, MA (September 2013)
- “Promising Practices in Undergraduate Science Education” – Cottrell Scholars Conference, Tucson, AZ (July 2013)

- “Promising Practices in Undergraduate Science Education” – Western Conference on Science Education, London, ON, Canada (July 2013)
- “Role of Discipline-based Education Research in Improving STEM Undergraduate Education” – Supporting Systemic Change in STEM Higher Education, AAU, APLU, and AACU, Washington, DC (June 2013)
- “NSF’s Response to the PCAST Engage to Excel Report” - Summit on Meeting the President’s STEM Call to Action A Joint Implementation Response to PCAST’s Engage to Excel Report, Business Higher Education Forum, Washington, DC (June 2013)
- “Discipline-based Education Research: Understanding and Improving Undergraduate Science and Engineering Education” – American Educational Research Association, San Francisco, CA (April 2013)
- “Two Revolutions in Learning” – Consortium on Financing Higher Education Assembly, Northfield, MN (April 2013)
- “Blended Models of Learning: Bringing Online to On-Campus” panel, MIT/Harvard Online Learning and the Future of Residential Education Summit, Cambridge, MA (March 2013)
- “Consensus Emerging From Research About Effective Undergraduate Science Education” - AAAS, Boston, MA (February 2013)
- “Re-Visioning Lab Learning” - AAAS, Boston, MA (February 2013)
- “Embracing the Future of K-16 Education” – Math Science Partnership Meeting, Washington, DC (February 2013)
- “‘Tipping’ Undergraduate STEM Education: Role of DBER” - Transforming Undergraduate Education in STEM Conference, Washington, DC (January 2013)
- “Promising Practices in Undergraduate STEM Education: Why Don’t We Implement Them” – Moore Lecture, Society for Integrative and Comparative Biology, San Francisco (January 2013)
- “Discipline-based Education Research: Understanding and Improving Undergraduate Science and Engineering Education” – National Academy of Science, Washington, DC (November 2012)
- “Implementing Vision and Change” – NABT, Dallas, TX (November 2012)
- “A Framework for K-12 Science Education” – Minnesota Department of Education conference, St Paul, MN (October 2012)
- “Role of Discipline-based Education Research in Improving Undergraduate Science and Engineering Education” – University of Massachusetts, Boston (October 2012)
- “Undergraduate STEM Education at a Tipping Point” – NSF DUE (October 2012)
- “Scaffolding Undergraduate Genomics Learning” – Washington University Integrating Cognitive Science with Innovative Teaching in STEM Disciplines conference (September 2012)
- “Integrating Research and Education to Enhance Learning in Genomics” – NSF EHR and BIO directorates, (August 2012)
- “Promising Practices in Undergraduate Science and Engineering Education: Why Don’t We Implement Them?” - University of Oklahoma (August 2012)
- “Re-envisioning Science Education: Building on Promising Practices” Amherst College (August 2012)
- “When Partridge Peas (*Chamaecrista fasciculata*) Flower – Gene x Environment Interactions” Amherst College (August 2012)
- “A Biologist’s Adventures in Discipline-based Education Research” - Enhancing Molecular and Cellular Bioscience Research and Educational Opportunities at Primarily Undergraduate Institutions (PUIs): Advancing Discovery While Training the Next Generation of Scientists, California State University at Fullerton (July 2012)
- “Scaffolding Whole Transcriptome Analysis for Genetics Students” – HHMI Genomics Education conference, Chevy Chase, MD (June 2012)
- “Discipline-Based Education Research: Understanding and Improving Learning in Undergraduate Science and Engineering”
- National Science Foundation, EHR, Washington, DC (May 2012)
 - Office of Science Technology and Policy and Domestic Policy Committee, Washington, DC (May 2012)
 - Association of American Universities, Washington, DC (May 2012)
 - Chemical Sciences Roundtable, Washington, DC (May 2012)
 - NRC Board on Science Education, Washington, DC (May 2012)
 - Association of Public and Land Grant Universities, Science and Mathematics Teacher Imperative Conference, Washington, DC (June 2012)
 - Introductory Biology Project conference, Washington, DC (June 2012)
 - Society for the Advancement of Biology Education Research, Minneapolis, MN (July 2012)
- “Re-envisioning Undergraduate STEM Education: Building on Promising Practices” – Oak Ridge Association of Universities, Oak Ridge, TN (March 2012)
- “From the Teaching Lab to the Research Lab: What Do Undergraduates Learn from Research Experiences?” – AAAS, Vancouver, BC, CA (February 2012)

Guest on NPR's "Talk of the Nation" regular Friday segment, "Science Friday" on "Rethinking – How Kids Learn Science" - <http://www.sciencefriday.com/program/archives/201111114> (11/11/1/)

"Exploring the Regulation of Flowering in the Non-papilionoid Legume *Chamaecrista fasciculata* (Partridge Pea)" – American Society of Plant Biology Meetings, Minneapolis (August 2011)

"Scaffolding Whole Transcriptome Analysis for Genetics Students" – Society for the Advancement of Biology Education, Minneapolis (July 2011)

"Learning and Teaching the New Biology" – Michigan State Prom/SE meeting, Chicago, IL (April 2011)

"Flowering on the prairie: Genotype, environment, and floral development in *Chamaecrista*, a model legume" – Northwest Developmental Biology Meeting, Friday Harbor, WA (March 2011)

"Evidence of What Works in Undergraduate STEM Education" – AAAS meeting, Washington, DC (February 2011)

"Learning to Teach, Teaching to Learn" – Howard Hughes Medical Institute, Washington, DC (October 2010)

"Evidence for Interdisciplinary Science Learning?" - PKAL/Keck National Colloquium on Leadership in Interdisciplinary STEM Learning, Washington, DC (October 2010)

"Flowering on the Prairie: *Chamaecrista* whole transcriptome sequencing project" – Hamline University, St. Paul (October 2010)

"Learning and Teaching the New Biology: Genomics in the Undergraduate Curriculum" – Society for Developmental Biology Annual Meeting, Albuquerque (August 2010)

"Faculty-coached Problem Solving" – Volunteer State Community College (June 2010)

"A New Biology Education for the 21st Century" – MnCUBE, Minneapolis (May 2010)

"Framing the National Lab Skills Initiative with America's Lab Report" – National Lab Skills Symposium, Washington, DC (April 2010)

"From Evidence to Action – Moving beyond America's Lab Report" – Center for Excellence in Education/Howard Hughes Medical Institute meeting, Washington, DC (February 2010)

"Insights from the Learning Sciences" – Dual Use Education keynote address, Warsaw, Poland sponsored by the InterAcademies and US Department of State (November 2009)

"Changes in Teaching in the Biological Sciences for the 21st Century" – American Society of Horticultural Science annual meeting, colloquium on "Effecting Change for the Future of Horticulture Higher Education (July 2009)

"Authentic Research in Genetics Lab" – Williams College, Big Science at Small Colleges meeting (July 2009)

"Exploring Whole Transcriptomes" – Washington University, iPlant meeting (June 2009)

"Closing the Gap in Introductory Biology Learning: Effect of integrating faculty-coached, in class problem solving" – Union College, Consortium for High Achievement and Success meeting (June 2009)

"Exploring Transcriptomes with Genetics Students" – University of Minnesota (May 2009)

"Lessons from the prairie: *Chamaecrista* shoot transcriptome and flowering" – International Conference on Legume Genomics and Genetics, Puerto Vallarta, Mexico (December 2008)

"The shoot transcriptome of the non-papilionoid legume *Chamaecrista fasciculata*" and "Integrating *Chamaecrista* research and education" - Beyond the papilionoids – International Conference on Legume Genomics and Genetics satellite workshop on "What can we learn from *Chamaecrista*?" (December 2008)

"Role of Evidence in STEM Education Policy" – Innovation 2008 Conference, Humphrey Institute of Public Affairs, Minneapolis (October 2008)

"Linking Evidence and Learning Goals" – Promising Practices in Undergraduate Education meeting, National Research Council, Washington, D.C. (October 2008)

"Comparative Genetic and Genomic Approaches to Understanding Flowering in Legumes" - Rensselaer Polytechnic Institute (April 2008)

"Integrating Research with Education, Outreach, and Training" - CSHL, iPlant Kick-Off (April 2008)

"Big Science at Small Schools: Integrating genomics research and education" – Carleton College (March 2008)

"Inequity in the American Public School System: Current status of our education systems and reform efforts to improve it" – Presenter on panel with Ted Kolderi (Education Evolving) and Amy Wilson (Johns Hopkins) at Carleton College (January 2008)

"Plant Genomics Education and Outreach" – The National Plant Genome Initiative: Achievements and Future Directions, NRC Keck Center (July 2008)

"How Students Learn Mathematics and Science: Implications for the Classroom" panel presenter for the Amgen - Teach for America Mathematics and Science Summit at McKinley Technology High School in Washington, DC (March 2007)

"Integrating Computational Modeling Across the Curriculum," PEW Midwest Consortium Conference, St. Olaf College (February 2007)

“Inclusive Science Education: Gathering Evidence and Building Community,” University of Washington Symposium on Diversity (November 2006)
 “America’s Lab Report” Harris County Science Supervisors meeting, Houston, TX (August 2006)
 “America’s Lab Report” ACS Western Regional Meeting, Anaheim, CA (December 2005)
 “America’s Lab Report – Investigations in High School Science” NRC Teachers Advisory Council, Washington, DC (December 2005)
 “High School Lab Experiences – America’s Lab Report,” sponsored by the Minnesota Department of Education (October 2005)
 “Can Plant Molecular and Developmental Biology Improve Human and Environmental Well Being?” President’s Plenary on Botany in the World’s Service at the Botanical Society of America annual meeting, Austin, TX (August 2005)
 “It’s All About Learning: The case for scientific teaching” plenary talk for Ecological Society of America symposium on Scientific Teaching, Montreal, CA (July 2005)
 “Evolution and Development of Legume Architecture” Model Legume Congress, Asilomar, CA (June 2005)
 “Modeling Inflorescence Architecture” Wroclaw, Poland (September 2004)
 “Regulation of Floral Meristem Identity: From Genes to Models” International Conference on Legume Genetics and Genomics. Dijon, France (June 2004)
 “Inflorescence Architecture,” Department of Computational Biology and Bioinformatics, University of Queensland (December 2003).
 “The Evolution of Inflorescence Development in Legumes,” School of Plant Sciences seminar, University of Tasmania (December 2003)
 “*COCH* and *PIM* Redundantly Regulate Floral Meristem Identity in *Pisum sativum*,” mini symposium on the Evolution Plant Reproductive Development, Plant Biology meetings, Honolulu (July 2003)
 “Maintaining Momentum: Sustaining Research at a PUI,” keynote address at PUI luncheon, Plant Biology meetings, Honolulu (July 2003)
 “Fear and Trembling: Technology and Faculty Inspiration/Intimidation,” The Collaboraton conference on “The Connected Campus: How technology is changing teaching and learning” Bloomington, Minnesota (February 2003)
 “Inflorescence Development in *Pisum sativum*: Role of Floral Meristem Identity Genes,” International Legume Genetics and Genomics Conference, Minneapolis (June 2002)
 Genetic Regulation of Inflorescence Architecture in Pea: Role of Arabidopsis floral meristem identity gene orthologs”, University of Minnesota, College of Biological Sciences (May 2002)
 “Learning to Do Biology”, University of Minnesota, College of Biological Sciences (May 2002)
 “Life at a Liberal Arts College”, University of Missouri, Columbia (May 2002)
 “Evolution of Inflorescence Development: *Arabidopsis* flowering gene homologs in pea”, CSHL Evolution of Developmental Diversity Meeting (April 2002)
 Integration of research and education workshop for NSF Biocomplexity awardees, sponsored by the NAS (April 2002)
 “Besler’s Florilegium” – Carleton library talk as part of a larger exhibition and series of talks on “Likeness into Presence – Facsimilies Across the Carleton Curriculum”
 “Genetic regulation of *Pisum sativum* architecture”, Edible Legumes session of PAG-X meeting in San Diego (January 2002)
 “Pea plants have fronts and backs: Role of *COCHLEATA* in asymmetry”, 4th International Legume Conference, Canberra, Australia (July 2002)
 “Regulation of inflorescence development”, symposium speaker in Understanding Floral Induction and Morphogenesis session, American Society for Horticultural Sciences (July 2001)
 Six presentations at meetings and colleges on funding opportunities at the National Science Foundation (2000)
 “Learning Communities – Carleton’s Triad” - opening plenary session speaker, with Ruby Sheets, Carleton ’02, for PKAL’s 10th Anniversary Conference (October 2000).
 “Genetic Regulation of Inflorescence Architecture in Pea”, Yale University – Department of Molecular and Cellular Biology (February 2000)
 “Making Flowers”, James Madison University – plenary speaker for student research symposium, (April 2000)
 Two presentations at the Society for Developmental Biology meetings (June 1999)
 “Integrating Research and Education in Biology” – NSF CAREER Awardees Meeting, Arlington, VA (January 1999)
 “Making Flowers” - for the Northfield Elder Collegium (October 1998)
 “Floral Architecture in Pea”- FASEB research conference, Vermont (August 1998)
 “Genetic Regulation of Inflorescence Architecture in Pea” - National Science Foundation, Virginia, (July 1998)

- “CELS Recommendations for Professional Societies” - Collaborations in Undergraduate Biology Education. A meeting held at Airlie Conference Center in Virginia and attended by the leadership of the major life science societies in the US (July 1998)
- “Professional Societies and the Faculty Scholar” - presentation focused on a monograph I helped the Coalition for Education in the Life Sciences (CELS) write. Joint meeting of the American Society of Plant Physiologists and CELS in Madison, WI, (July 1998)
- “Making Flowers” - a historical and current day analysis of the study of flowering and flowers. Linda Hall Library talk, Kansas City, MO (May 1998)
- “Global Warming and Hornworms” - part of the Carleton Learning and Teaching Center series on Learning Communities (April 1998)
- “Flowering in Peas” Sussex Plant Development Symposium, Berkeley (June 1997)
- “Life at a Liberal Arts College” University of Wisconsin’s Life Science Career Day (May 1997)
- “Regulation of Floral Development in Pea” Rensselaer Polytechnic Institute (April 1997)

Colloquia prior to 1997

Carleton College, Carnegie Institute of Embryology, Mankato State, Massachusetts General Hospital - Dept. of Molecular Biology. Molecular Genetics Inc., Minneapolis, Plant University of Minnesota - Plant Science Dept. Molecular Genetics Institute - Univ. of Minnesota, Smith College, St. Olaf College, University of Georgia, University of Northern Iowa, Univ. of Wisconsin, Madison

Invited symposia talks prior to 1997

International Society for Plant Molecular Biology meeting – flowering symposium (Tucson, AZ)
 Society for Developmental Biology (Vanderbilt University)
 Botanical Society of America meetings - inflorescence symposium (Montreal)
 International Developmental Biology meetings (Utah)
 Gordon conference on plant development (New Hampshire)

OTHER NATIONAL AND STATE PROFESSIONAL CONTRIBUTIONS

NSF specific

Interagency Working Groups

- Leading implementation of the undergraduate goals of the first [Federal STEM Education 5-year Strategic Plan](#) across all fourteen federal agencies, including development of metrics and indicators
- Cross Agency Priority Goals (performance.gov):
 - Co-led completion of 2013 Cross Agency Priority Undergraduate Education Goal
 - Co-leading Cross Agency Priority Goal implementation of undergraduate objectives of the Federal STEM Education 5-year Strategic Plan (2014 – present)
- White House College Opportunity Regional Workshops
 - University of Maryland, Baltimore County, moderated keynote panel and working session on Improving Mathematics Success (September 2014)
 - University of Colorado, Boulder, moderated Science, Technology, Engineering and Mathematics (STEM) Innovation working session (September 2014)
 - Florida International University, moderated STEM Innovation working session (October 2014)
- Convened federal agencies, experts, and stakeholders to develop a plan for coordinating and leveraging technology-enhanced education (2013)
- Represented NSF for workforce development contributing to:
 - President’s Council of Advisors on Science and Technology *Advanced Manufacturing Partnerships 2* (AMP2) report
 - White House Innovation Working Group on regionally aligned workforce development
 - Investing in Manufacturing Community Partnerships
 - National Network of Manufacturing Innovation
 - NSF funding of an Advanced Technological Education Collaborative Center for Technical Assistance for the Department of Labor Trade Adjustment Assistance Community College and Career Training (TAACCCT) program

NSF working groups (2013-2016):

- Led Division Director's roundtable – professional development for division leaders
- Co-led New Faculty Program Design Team across NSF to recommend programmatic change
- Contributed leadership to Community College Innovation Challenge, including bootcamp for finalists and event on Capitol Hill (http://www.nsf.gov/news/special_reports/communitycollege/).
- Led NSF-wide goal teams:
 - Successfully led the NSF wide 2013 Priority Goal on Undergraduate Education
 - Successfully co-led NSF strategic review of integration of education and research goal effort, including NSF-wide symposium (April 2015)
 - Led NSF-wide analysis of education investments in large centers
- Led NSF Framework for Undergraduate STEM Education Design Team
- Contributed leadership to coordination of all undergraduate investments across the NSF into a common framework, as well as ongoing implementation and evaluation

NSF Education and Human Resources Directorate level work (2013-2016):

- Successfully led development and launch of major new, agency wide, funding initiative and strategy – Improving Undergraduate Science, Technology, Engineering and Mathematics (STEM) Education (IUSE), recognized by significant increases in the White House 2014, 2015, and 2016 budget requests.
- Successfully led redesign and launch of a scholarship program to integrate guided pathways to support college completion (Scholarships for STEM)
- Enhanced Division of Undergraduate Education's portfolio with increased investments in discipline-based education research, community college investments, course-based research, teacher pre-service development, institutional transformation, and scaling of evidence-based practices.
- NSF-funded *Reaching Students: What Research Says About Effective Instruction in Science and Engineering*, released in 2015, was the most downloaded report of the year at National Academies Press (over 17,000 downloads). This guide translates the research in the *Discipline-based Education Research* report for practitioners
- Contributed to FY 2014, 2015, 2016, and 2017 NSF budget development
- Co-led development of two Data-Intensive Research in Education workshops resulting in 2015 Computing Research Association publication, *Data-Intensive Research in Education: Current Work and Next Steps* (<http://cra.org/wp-content/uploads/2015/10/CRAEducationReport2015.pdf>)
- Advancing NSF and philanthropic foundations collaboration to advance work on the role of intrapersonal and interpersonal domains in learning through a 2015 National Academies symposium on "Hard-to-Measure Cognitive, Intrapersonal and Interpersonal Competencies"
- Lead effort to improve mathematics learning in first two years of college as NSF commitment to December 2014 White House College Opportunity Summit, resulting in funding of 30 innovative proposals
- Led re-visioning of investment strategies in pre-service teacher development
- Increasing quality investments in research on technician and pre-service teacher development
- Three key National Academies consensus studies launched at NSF's request on:
 - Developing Indicators for Undergraduate STEM Education (http://sites.nationalacademies.org/DBASSE/BOSE/CurrentProjects/DBASSE_167108)
 - Assessing Intrapersonal and Interpersonal Competencies (undergraduate STEM education focus, http://sites.nationalacademies.org/DBASSE/BOTA/CurrentProjects/DBASSE_160583)
 - Strengthening Research Experiences for Undergraduates (emphasis on course-based research, http://sites.nationalacademies.org/DBASSE/BOSE/CurrentProjects/DBASSE_090473)
- Increased Division of Undergraduate Education's expertise in discipline-based education research and diversity through strategic hires (36 hires: 1/3 from under-represented groups and 2/3 women)

NSF Biology Directorate working groups (1999-2001):

- Research at Undergraduate Institutions (RUI)
- Undergraduate Mentoring in Environmental Biology (UMEB)
- Biology Directorate Education Philosophy
- Evolution of Development
- National Science, Technology, Engineering, and Math Education Digital Library (NSDL)
- Organized monthly meetings for the Biology Directorate and the Education and Human Resources Directorate

Professional societies and other contributions

Editor, CourseSource (2018-present), <https://www.coursesource.org>

Community College Innovation Challenge judge (Washington DC, June 2017 and 2018, sponsored by NSF and American Association of Community Colleges, https://www.nsf.gov/news/special_reports/communitycollege/ (lead launch while at NSF, see also: <http://www.sciencemag.org/news/2017/07/competition-helps-college-students-find-place-science>)

Learning@Scale session moderator for Learning to Code (MIT, Cambridge, MA, April 2017)
<http://learningatscale.acm.org/las2017/>

Learning@Scale program committee member, (2017-2019), <http://learningatscale.acm.org/las2019/>

AAAS: From Research to Action: Improving Undergraduate STEM Education symposium organizer (February 2014 with Ann Austin, San Jose, CA)

AAAS: Undergraduate Science Education at a Crossroad: Responding to Research Findings symposium organizer (February 2013 with Martin Storksdieck, Boston, MA)

AAAS: Interconnected Communities for Biological Research: Integrating Undergraduates symposium organizer (February 2012 with Trish Morse, Vancouver, BC, CA)

Session moderator, HHMI Genomics Education meeting, June 2012

HHMI CourseSource – Cell Biology and Plant Biology groups, review committee (2012-present)

Session organizer, Tools for Change group of Vision and Change in Undergraduate Biology Education (AAAS and NSF) (Washington, DC, July 2009) <http://www.visionandchange.org/>

Tuning USA Project member (Lumina funded, MN, IN, UT higher education learning outcomes initiative, 2009-present)
http://www.luminafoundation.org/our_work/tuning/

Minnesota Renewable Energy Roundtable member (2006-2012)

Workshop organizer for December 2008 International Conference on Legume Genomics and Genetics (Beyond the papilionoids - What can we learn from *Chamaecrista?*, Puerto Vallarta, Mexico) <http://www.ccg.unam.mx/iclgg4/>

Panel leader, The National Plant Genome Initiative: Achievements and Future Directions National Academies, Board on Life Science (Washington, DC, July 2007)

Session moderator, Teaching and Learning to Improve Undergraduate Education: A Leadership Summit to Effect Change in Teaching and Learning, National Academy of Sciences Board on Agriculture and Natural Resources and Board on Life Sciences, (Washington, DC October 2006) http://www.nap.edu/download.php?record_id=12602

Participant, Workshop on the Conceptual Basis of Biology, National Academies, Board on Life Science (Washington, DC, December 2006) http://www.nap.edu/catalog.php?record_id=12026

Computational and Mathematical Biology working group of the Mathematical Association of America (2006)

Member, midcourse evaluation workshop for the NSF Arabidopsis 2010 program (Arlington, VA August 2005) – produced a report titled Midcourse Assessment of Arabidopsis 2010 (<http://www.nsf.gov/pubs/2006/bio0601/bio0601.pdf>)

Botanical Society of America, Scientific Inquiry through Plants outreach (working with science superintendent of the Chicago Public Schools to broadly implement program piloted in other urban and rural schools)

Member, workshop on Cross-Legume Genomics, Santa Fe, NM (December 2004) – see Paul Gepts, William D. Beavis, E. Charles Brummer, Randy C. Shoemaker, H. Thomas Stalker, Norman F. Weeden, and Nevin D. Young Legumes as a Model Plant Family. Genomics for Food and Feed Report of the Cross-Legume Advances through Genomics Conference Plant Physiol. 137: 1228-1235

Organizer (with Shirley Tucker), Development and Structural Morphology Symposium, Fourth International Legume Conference, Canberra, Australia July 2001

Organizer, PKAL Summer Institute, Science for All: Integrated Biology, July 2001 (Snowbird, Utah)

NSF ‘observer’ for workshop on the future of Evo-Devo, October 2001 (Arlington, VA, workshop report is printed and on the web at <http://www.nsf.gov/pubs/2001/bio012>)

Organizer, PKAL Future of Plant Biology Workshop, July 2000 (Keystone, CO)

McGraw-Hill General Biology Symposium – 1999 and 2000 (St. Louis, MO and Key West, FL)

Session chair – Society for Developmental Biology Education Symposium (University of Virginia, 1999, organizing 2002 session in Madison)

Session chair - US-Australian Flowering Meeting (1991)

Session chair - Developmental Processes, ASPP meeting (1991)

Organized ASPP Fast Plants Workshop, Madison, WI (1990)

Participant in ASPP workshop on Role of the Society in Science Education (1989)

Helped organize Plant Development pre-meeting held in conjunction with national meeting of Society for Developmental Biology, St. Paul, MN (June 1987)

PROFESSIONAL AFFILIATIONS

American Educational Research Association
American Association of Colleges and Universities
Association Colleges of the South, chief academic officers' group
American Conference of Academic Deans
Annapolis Group of Liberal Arts Colleges, chief academic officers' group
Southern Association of Colleges and Schools Commission on Colleges – Academic Evaluator training in progress
American Society of Plant Biologists
Society for Developmental Biology
Botanical Society of America
National Association of Biology Teachers
National Science Teachers Association
National Association for Research in Science Teaching
Society for the Advancement of Biology Education Research
AAAS
Sigma Xi
Pisum Genetics Association

CARLETON COLLEGE SERVICE

HHMI grant coordinator for Teaching as Learning Program for science students exploring teaching (2011-2013)
HHMI grant coordinator for Cross-disciplinary Transfer of Learning initiative (2011-2013)
Strategic Planning Curriculum Committee (2011-2013)
Chair, Faculty Compensation Committee (2010-2013)
Philosophy Department internal review committee (2010-2011)
Churchill and Goldwater Fellowships advisor (2010-present)
Biology Department assessment coordinator (2009-2013)
Fellowships committee (2008-2010)
Carleton reaccreditation committee on assessment (2007)
Mayo Scholars faculty mentor (2006-present)
Organized campus-wide workshop on Interdisciplinary Computational Modeling (2006)
Teacher Education Committee (1995-1998, 2004-2007)
Cognitive Studies Concentration (1997-2013)
Writing Advisory Committee (2004)
Mellon Information Literacy Grant Advisory Committee (2000-2003)
Program in Ethical Reflections advisory committee (2002-2003)
Carleton coordinator for University of Minnesota PFF program (2000-2003)
Coordinator, Perlman Center for Learning and Teaching (2000- 2003, <http://www.acad.carleton.edu/campus/LTC/>)
Co-director, Mellon Faculty Lifecycles collaborative grant with Macalester College (2001-2003)
Workshop for Swedish university administrators (participated in planning and facilitating week long workshop in 2001)
Mid-career Faculty Conversation facilitator (December 2001, 2002)
College Committee on Convocation and Conversation (2000-2003)
Coordinator for Fall 2001 Faculty Retreat (sexual harassment training, technology in the classroom workshops)
Learning and Teaching Center Advisory Committee (1998-present, chair 2000-present)
DIG (Diversity Initiative Group, 2000-2003)
Faculty Personnel Committee (tenure committee, 1996-1999)
New Faculty December Teaching Workshop facilitator (1994-2004)
Faculty Computing Liaison for the sciences (1994-1997)
Chair of Academic Computing Advisory Committee (1996-97)
Junior Faculty Affairs Committee
Commission on the Status of Women
Sexual Harassment Education Committee
Air Toxic Study Group including seminar on methylene chloride emissions in Northfield
ACM and Ford Mellon minority fellowships selection committees

Multicultural Affairs freshman intern and summer research program participant
Exhibits Coordinator for Regional Science Fair at Carleton
Observing/working with student teachers in Educational Studies program
College panels for high school guidance counselors (women in science and faculty life at Carleton)
Girl Scout Science Day (organized in 1995, now this yearly event is completely organized and run by Carleton students)

REVIEWING RESPONSIBILITIES

Journal articles

American Educational Research Journal - Social and Institutional Analysis
American Educational Research Journal
American Journal of Physics
American Journal of Botany
American Journal of Physics
Bioscience
CBE – Life Sciences Education
CourseSource
Development
Developmental Biology
Frontiers in Plant Genetics and Genomics
Innovative Higher Education
International Journal of Plant Science
Journal of Research in Science Teaching
Journal of Science Education and Technology
Physiologia Plantarum
Planta
Plant Cell
Plant Journal
Plant Physiology
PNAS
Review of Educational Research
Science
Science Advances

Editorial responsibilities

Senior Editor, CourseSource
Review Editorial Board of Frontiers in Plant Genetics and Genomics
Series Editor, Wiley/American Society for Plant Biology Plant Biology Education series (2010-2013)
Consulting editor for McGraw Hill Encyclopedia of Science and Technology (Yearbooks for 7th edition and revision for 8th edition)
Undergraduate education editor for Plant Developmental Biology Newsletter (1986-1992)

Grant review panels

NSF INCLUDES
NSF Research and Evaluation on Education in Science and Engineering Panel
NSF Undergraduate Biology and Mathematics Panel
NSF site visit teams
NSF Developmental Mechanisms Panel
NSF NATO Postdoctoral Fellowship Panel
NSF Bacterial Artificial Chromosome Library Construction Panel
NSF Research Experiences for Undergraduates Panel
NSF Course Curriculum and Laboratory Improvement and NSF Instrumentation and Laboratory Improvement Panel

Ad hoc reviewer – NEH, Keck, NSF (Developmental Mechanisms, Plant Genome, Integrated Plant Biology, Science and Technology Centers, MRI, REU, ILI), USDA (Plant Growth and Development), DOE (Energy Biosciences), M. J. Murdock Charitable Trust, Sloan Foundation

VISITING COMMITTEES AT OTHER INSTITUTIONS

Mount Holyoke, Department of Biology (2011)
Vassar College, Department of Biology (2010)
Hamline University, Science Division (2009)
Davidson College, Department of Biology (2008)
Kenyon College, Department of Biology (2008)
Lake Forest College, Department of Biology (2004)
Williams College, Department of Biology (2003)
University of Wisconsin, Stout, Department of Biology (2003)
Wabash College, Department of Biology (2002)
Colby College, Department of Biology (2001)
Amherst College, Department of Biology (2000)
Swarthmore College, Department of Biology (1998)

COURSES TAUGHT (course load - 6 courses/year)

Introduction to Biology I: Energetics and Genetics
Introduction to Biology II: Diversity, Form, and Function
Genes, Evolution and Development
Genetics
Plant Biology
Plant Development
Learning Science: Introduction to Cognitive Science
Developmental Genetics
Food and Cooking (first year seminar focused on biology and chemistry)
Origins and Mind – a first year, linked course program with Philosophy and Psychology
Interdisciplinary Biochemistry Senior Integrative Exercise

RESEARCH STUDENTS

Undergraduate research colleagues (1986-present)

Cole Hannon ('87) – Competence for floral development in tobacco seedlings. Clinical program manager, Medtronic.

Lois Bauer ('87) – Effect of plant growth substances on *Drosera rotundifolia*. Went to Johns Hopkins Medical School, now a pediatrician.

Sarah Huber ('88) – Floral development of asters. Peace Corps in Bolivia, research technician at Cornell, high school teacher in Maryland.

Ann Holtz ('88)-Competence of tobacco internode tissue for floral development. Staff scientist, Lawrence Livermore National Lab

Lynn Quam ('88, St. Olaf) – Effect of position on pea axillary bud development. Research technician at Mayo.

Quynh Nguyen ('89)-Effect of the *veg* mutation on axillary bud development in pea. University of Minnesota Medical School.

Scott Moses ('89)-Transposon tagging of the Maryland mammoth gene in *Nicotian tabacum*. University of Minnesota Medical School, family physician in MN.

Daniel Christ ('89, St. Olaf)- Developmental physiology of the *det* mutant of *Pisum sativum*. Horticulturist for a commercial greenhouse.

Tim Jegla (°90)-Stability of determination for vegetative shoot formation in cultured tobacco. Ph.D. in neurobiology from Washington University, postdoc at Stanford. assistant professor at Penn State

Marti Louw (°90)-Competence for floral development. Associate producer, WGBH/NOVA, pursued a media degree at Carnegie Mellon.

Heidi Asbjorensen (°89)-Readings in agroforestry. Graduate school at Yale in forestry.

Bev Nazarian (°89)-Leaf processes in flowering in tobacco. University of Minnesota Medical School. Currently a pediatrician in MA

Yvonne Stephanie Carrasco (°92)-Effect of *veg* on inflorescence determination in pea. Research coordinator, University of Texas, El Paso.

Erik Stokstad (°92)-Isolating plasma membrane proteins from single shoot apices. Correspondent for Science Magazine.

Tracy Smith (°90)-Gene expression in photoperiodically induced leaves of *Pharbitis* and *Nicotiana*. Ph.D. MIT, postdoc at UCSF, currently a science writer

Tanya Halvorsen (°91, MIT)-Photoperiodic induction of gene expression in *Nicotiana*. M.D./Ph.D. University of California, San Diego, pediatric endocrinologist, St. Paul, MN

Pat Carriere (°91)-Effects of high levels of B-chromosomes on embryo development in maize. Professor and Chair, Dept. of Theatre & Communication Arts, Bemidji State University

Carolyn Ferguson (°90)-Inflorescence determination in pea. Ph.D. University of Texas, Austin, postdoc Washington University, Professor, Kansas State.

Steve Halligan (°91)-Assay to isolate plasma membrane proteins from individual shoot apices. Senior technician, Geek Squad

Louise Latterell (°91)-Stability of determination for shoot organogenesis in tobacco. University of Minnesota Medical School, family physician and clinical professor, University of Wisconsin, Madison.

Chris Navia (°92)-Competence for floral determination in tobacco. Went to graduate school in political science, University of Michigan.

Phillip Chung (°91) – Effect of genotype on timing of inflorescence determination in pea. Physician

Samara Reck-Peterson (°93)-Stability of determination for floral shoot organogenesis in tobacco internodes. Ph.D. Yale, postdocs at Stanford and UCSF. Assistant professor, Department of Cell Biology, Harvard, currently Professor of Cellular and Molecular Medicine, University of California, San Diego

Andrea Winbauer (°92)-Effects of light and sucrose on stability of shoot organogenesis in tobacco internodes. Attended graduate school at Washington State University, Pullman. Technologist, ARUP Labs.

Karen Ong (°94)-Effect of light and sucrose on timing of initiation of shoot meristems in culture. High school teacher, Brookline, MA.

Monique Oliver (°94) – Analysis of growth of rapid cycling *Brassicacae*. News producer, WTVD ABC11, Durham, NC

Eugene Hong (°93)-*det-a* heterochronic mutation affecting apical senescence in pea. M.D./Ph.D. University of Washington.

Pam Holloway ('92) - Flowering in culture apices of pea. Career in teaching and directing high school theater, Bancroft School, Holden, MA

Paula Hong ('91) - Shoot regeneration from cultured pea meristems. Pediatric ophthalmologist, Reno, NV

David Remucal ('93) – Heterostylous development in purple loosestrife. Graduate school, University of Colorado, Denver

Renee Delozier Read ('94) – Role of flowering time genes in pea on meristem development in culture. Graduate school Washington University

Charles Johnston ('95) – Role of leaf primordial in early flowering in pea. Editor, Lost Planet

Glen Rundell (Rochester Institute of Technology) - Image analysis to quantify meristem size differences between *det* and wild-type peas. President and CEO, Advanced Information Management Group, Schenectady, NY

Mark Havrilla Ainsworth (Kenyon College) - Image analysis of meristem shape in pea mutants. PhD U.C. Davis

Amy Horan (University of Wisconsin, River Falls) - Premature senescence in *det* mutants of pea, administrative associate, Northfield Middle School

Lisa Ainsworth (UCLA) and Kate Ainsworth Lovrien ('95) - Misconceptions in plant biology (funded by NSF REU site in Cognitive Studies). Kate went to graduate school at Washington University.

Doug Wicczorek ('95) - Used RFLP analysis to investigate possibility that the pea homolog of the Arabidopsis gene AP1 was the gene identified by the *pim* mutation in pea. PhD, University of Iowa.

Jenny Fick ('95)- Morphometric Analysis of a Meristem Identity Mutant of Pea. She presented her research at the Pew Biological Sciences Symposium and at the Carleton Student Research Symposium in the Fall of 1995. Veterinarian, graduated from University of Michigan Veterinary School.

Lydia Ong ('96) - Role of Gibberellins in Floral Meristem Development in Pea. University of Minnesota Medical School

Amanda Peterson Sarata ('96) - Amanda worked with Doug Wicczorek and used RFLP analysis to investigate possibility that the pea homolog of the Arabidopsis gene AP1 was the gene identified by the *pim* mutation in pea. She worked as a laboratory technician in industry after graduation, then enrolled in a dual degree program in law (J.D.) and Science and Technology Policy (M.S.)

Doreen Hartzell ('98)- Morphological and genetic analysis of a non-flowering mutant of pea. Doreen graduated with degrees in German and Biology, followed by a Fulbright Fellowship in Germany. Employed by Durag, Inc.

Sunshine Garber Beck ('96)- Investigated interactions among genes regulating the number of flowers formed per node on garden peas. Case Manager Assistant, Diocesan AIDS Ministry, Texas

Catherine Reinke ('98) - Transformation of pea with *Arabidopsis* genes. Catherine took off winter term 1997 and worked full time on her project in the lab with the support of NSF REU funds that supplemented my grant. Her research experience helped her obtain a summer 1997 position at Cornell. She graduated from Carleton with degrees in English and Biology, has a Ph.D. from the University of Chicago, taught at Carleton, postdoctoral fellow at Northwestern, currently associate professor Linfield College, Oregon

Josh Miner ('98)- Protein purification for antibody production.

Andrew McCall ('98)- Investigated the evolution of branching patterns in legumes. Andy was a Fulbright Fellow in New Zealand and earned a Ph.D. in ecology at U.C. Davis. Visiting faculty member at Carleton (2006), currently an associate professor of biology at Dennison College.

Jim Crantz ('98)- Expression of the pea homolog of *AP1* in the common sepal/petal whorl of pea flowers. Graduate studies in ecological modeling at the University of Michigan, currently research associate at University of Minnesota

Jane Bowen ('99)- Purification and sequencing of putative cloned genes (pea homolog of *CEN* in snapdragon). Graduate school – University of North Carolina, Chapel Hill

Scott Haddock ('00) - Worked with Jane Bowen on sequencing of putative cloned genes (pea homolog of *CEN* in snapdragon). Attended graduate school in genetics. Lab technician, virology

Sara Rubinstein ('98) - Analysis of meristem termination in *det uni* double mutants of pea. Currently a professional photographer.

Yenab Lau ('98) - Analysis of segregation ratios of crosses of two pea genes to determine whether or not they function independently. Graduate school, employed by USDA Forest Service

Amanda Helin ('98) - Scanning electron microscopy analysis of *veg2-2* mutant of pea to determine if an inflorescence branch reverts to a vegetative branch. Amanda is working as a research technician at the University of Chicago.

Gita Rao ('98)- Transformed *pim* mutant of pea with *AP1* gene of Arabidopsis to determine whether or not there was functional homology between the two genes. Gita graduated with a degree in English and is currently program director for Cabrini Connections in Chicago.

Kris Groff Barry ('98) - developed an in situ hybridization technique in pea so we could study the expression patterns of flowering genes in different pea mutants. Kris received a Ph.D. in horticulture at the University of Florida, did a postdoctoral fellow at the University of Texas. Currently production manager at Groff's Plant Farm.

Brad Short ('00)- environmental effects/GA effects on *pim*. Teach for America, currently PhD candidate at University of Michigan

Jason Fischbach ('99)- environmental effects/GA effects on *pim*. Wilderness Ranger, US Forest Service.

Laura Cox ('98)- construction of plasmids with different markers for *Agrobacterium* transformation of plants. Technical services at Epic Systems in Madison, WI.

Ingrid Anderson ('99) - analysis of the *coch* mutant of pea that alters symmetry (SEM analysis), graduate school Indiana University, Lung Cancer Program Manager at Sarah Cannon Research Institute

Melissa Carlson ('99) - effect of gibberellic acid on the floral mutant, *pim*, of pea analyzed in the *pim* slender double mutant (*slender* increase gibberellic acid levels). Melissa also investigated the effects of another gibberellic acid biosynthesis gene (*LE*) on *pim*. Wilderness Ranger, US Forest Service.

Carey Sydney ('99) - experimental analysis of the *coch* mutant of pea (a mutation that gives the plant a true front and back!) to determine whether the gene is regulated by other flowering genes or is active during the vegetative phase of development. Techniques include meristem culture, grafting, surgical manipulation of the meristem, scanning electron microscopy, and genetic analysis. *Coch* is a potential homolog of the Arabidopsis *AGL8* gene.

Laura Hopper ('99) - analysis of the timing and location of the expression of the *PIM* gene in pea which is critical in assigning floral meristem identity. Also continuing efforts to clone the pea homolog of the *CEN* gene from snapdragon which suppresses terminal flower formation. Clinical Research Coordinator, Americas Doctor.

Erin McKittrick ('01) - Erin is investigating the interaction between *coch* and *pim*. The double mutants have an almost complete inhibition of floral development. Graduate school, University of Washington, currently runs Ground Truth Trekking

Katherine Fitzgerald ('01) – Asymmetry in *COCHLEATA* mutants (received honor in independent study, completed graduate study at Utah in mathematical biology followed by graduate study in ecology at Stanford.

Liz Addis ('02) - Expression of *PEAM9* using in situ hybridization. Currently a graduate student at University of Washington, postdoc at Iowa State, assistant professor Gonzaga University.

Kenechi Ejebe ('02)– Transforming peas with *Agrobacterium* . Completed a research fellowship at the NIH followed by medical school at George Washington University.

Katherine Kleese Bloome (Grinnell student) – Transformation of pea using *Agrobacterium*. After graduating from Grinnell Katie took an environmental education position in northern Minnesota. Director of Audobon Nature Center of the Northwoods, currently Minnesota Public Radio

Erin Boswell ('02)– Genetic analysis of multiflowering in pea. Masters in Public Health after a research fellowship at the CDC in Atlanta, followed by medical school.

Soren Peterson ('05)- Cloning *PeaFUL* from *COCH* mutants. Graduate study at Stanford.

Suzanne Stock ('03)– Analysis of *PIM* expression in *COCH* mutants. Dental school in Iowa, practicing orthodontist

Lindsay Cabert ('03)– Cloning *COCH* by putative homology with *FUL*, teaching students with learning disabilities.

Dan Spieler ('03)- Cloning *PeaFUL* from *COCH* mutants. Graduate study at Duke.

Shabeynoor Talukder ('04)– Investigation of rotational transforms for branching in peas with asymmetric leaf morphology, graduate study at University of Toronto, followed by law school

Lien Ly ('04)– 3D analysis of branching in *COCH* mutants, graduate study at Rutgers

Julie Nilsen ('04)– Application of L-systems using L-studio to modeling mutant peas

Melissa Dozier ('03)– Analysis of redundant functions of *COCH* and *PIM*.

Sarah Tilman ('05) – Morphological comparison of double mutants of *PIM* and different *COCH* alleles. Taught high school in Washington, DC (deceased)

Julie VanderMeer ('05) – Cloning genomic *peaFUL* gene in pea, research fellow at NIH, graduate study UCSF

Adipong Bricksawana ('06) – Candidate gene approach to clone *GRITTY* in pea, PhD Mayo Graduate School, now in medical school

Adam Williamson ('06) – Candidate gene approach to clone *RUINOUS* and *COCHLEATA* in pea. PhD in molecular biology from U.C. Berkeley

Jessie Singer ('07) – Investigation of rotational transforms for branching in peas with asymmetric leaf morphology. Coordinated literacy program at Lincoln Neighborhood School in Minneapolis, followed by graduate study in French Literature at Berkeley

Tenzin Desat ('07) – Comparison of *AP1* homologs in pea and *Chamaecrista*

Anjali Mishra (‘07) – *Chamaecrista* homologs of pea inflorescence architecture genes, research technician at the University of Minnesota

Jayne Johnson (‘06) – Virus-induced gene silencing to create phenocopies. Duke PhD, visiting faculty at Earlham, postdoctoral fellow at MIT

Kellie Carim (‘06) – Asymmetry in purple coneflower populations.

Ron Hulse (‘07) – Genome walking to identify promoter region of *PIM*. Graduate school at the University of Chicago

Raven Bier (‘07) – Genome walking strategies to identify promoter region of *PIM*

Jenna Forsyth (‘07) – Sequencing the promoter region of *PIM*, graduate school at University of Washington (NSF pre-doctoral fellowship)

Anna Jolene Mork (‘10) – *Chamaecrista* homolog of *PIM*, Goldwater Fellowship recipient, graduate school MIT (NSF pre-doctoral fellowship)

Geoffrey House (‘09) – 5’ RACE to identify promoter region of *Chamaecrista* homolog of *PIM*, graduate study University of Minnesota

Liana Burghardt (‘07) – Real time PCR analysis of gene expression in pea, currently a graduate student with Kathleen Donohue at Duke.

Zain Ali (‘08) - Constructing VIGS vectors for *Chamaecrista*, graduate student in Hopi Hoekstra’s lab at Harvard

Kim Morrell (‘09) – Characterizing the 3’ end of *Chamaecrista* homolog of *PIM*, graduate student Cornell, NSF graduate fellowship

Emily LeGrand (‘09) – Modeling interspecies defense responses to plant volatiles, graduate school University of Minnesota

Viviann Chen (‘09) – Programming bioinformatics tools in Perl, graduate school at Columbia

Margaret Taylor (‘10) - Testing VIGS constructs in peas, PhD in Plant Biology, University of Minnesota

Fangyu Lee (‘10) – Ecotype diversity in *Chamaecrista*

Danny Wells (‘11) – *Chamaecrista* shoot transcriptome analysis, graduate school Northwestern

Anna Newman (‘11) – Flowering gene expression patterns in *Chamaecrista*, graduate student Ohio State

Hunter Martin (‘11) - DNA barcoding of aster species in the Carleton Arboretum, nursing school

May Dixon (‘11) – Sequencing of the *COCH* homolog in *Chamaecrista*

Kelly Mayo (‘11) – Characterization of the *COCH* homolog in *Chamaecrista*

Kai Knutson (‘11) – Analysis of the *Chamaecrista* transcriptome with JMP Genomics, Watson Fellowship awardee

Kyla Walter (‘11) – Expression of autonomous pathway flowering genes in *Chamaecrista*

Anna Snyder (‘11) – Expression of temperature-dependent flowering genes in *Chamaecrista*

Kristine Nachbor (‘12) – Effect of photoperiod on flowering in *Chamaecrista*

Madelyn Lehnard (‘12) – Developmental regulation of photoperiod genes in *Chamaecrista*

Marika Xydes Smith (‘13) – Expression of flowering genes in prairie-grown *Chamaecrista*, Carleton Science Fellow

Meera Sury (‘14) – Genetic diversity of Weaver Dune and McKnight Prairie *Chamaecrista*

Cameron Stahl (‘14) – Investigating chitinase activity in *Sarracenia leucophy* in the absence of symbionts

Rachel Gottesman (‘12) – FT and flowering time in *Chamaecrista*

Ian Hollyer (‘13) – FVE and flowering time in *Chamaecrista*

Sarah Carter (‘13) – SVP and flowering time in *Chamaecrista*

Lindsay Guthrie (‘13) – Population genetics structure of Weaver Dune and McKnight Prairie *Chamaecrista*

Anna Brezney (‘13) – Population genetics structure of Weaver Dune and McKnight Prairie *Chamaecrista*

Raghu Chandra (‘14) – Circadian expression of FT in *Chamaecrista* under short day conditions

Shanna Yang (‘14) - L-systems modeling of broccoli inflorescences

Jorde Ranum (‘15) – Temperature effects on *Chamaecrista* flowering time

Stephanie Kravitz (‘13) – Comparisons of *Chamaecrista* flowering time in three Minnesota prairie remnants

Dhbilan Marasinghe (‘14) – Genetic diversity in *Chamaecrista* populations in two Minnesota prairie remnants

Ned Heckman (‘13) – Analysis of student models of gene x environment flowering time interactions

Ben Bedore (‘13) - Genetic diversity in *Chamaecrista* populations in two Minnesota prairie remnants

Kaitlyn Gerber (‘14) – Diversity analysis of *Chamaecrista* in McKnight and Weaver Dunes Prairies, MN

Representative meetings undergraduate research students have presented at

International Botanical Congress (Vienna, Austria, St. Louis, MO)

International Legume Genomics and Genetics Conference (Asilomar, CA)

Society for Developmental Biology (Washington, D.C., Purdue University, University of Virginia)

National Conference on Undergraduate Research (Union College, Cal Tech, Univ. of Minnesota)

Minnesota Academy of Sciences (Macalester College, St. Olaf College)

Keystone Symposia – Evolution and Development of Flowering (Taos, NM)

American Society of Plant Physiologists (San Antonio, TX, Minneapolis, MN, Madison, WI, San Diego, CA)

Undergraduate Plant Research Conferences (University of Wisconsin, Madison)

University of Minnesota Developmental Biology Symposium

Sigma Xi (North Carolina)

Midwest Plant Physiology meetings (Kalamazoo, MI, Madison, WI)

High school research students mentored from 1986-2012 - 13 (10 from Northfield, 4 from San Antonio, Texas)

Graduate students mentored

Amelia Storer – Rollins MBA student, Organization-Focused Change Networks focused on improving undergraduate STEM education (B.S. Mechanical Engineering, University of Florida)
Benjamin Taylor, University of Wisconsin, Madison, Delta intern winter 2009, currently Assistant Professor, LaGuardia Community College, New York City
Scott Taylor, University of Tasmania, lab visitor
Three University of Minnesota preparing future faculty interns
External evaluator for Katherine Parmenter’s PhD dissertation, University of Queensland

Post-doctoral advisees

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Coach, Northfield High School Science Olympiad Team (2007-2013)
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