

CURRICULUM VITA GLENDA E. GILLASPY

Department of Biochemistry 111 Engel Hall
Virginia Tech Blacksburg, VA 2406

Expertise

I am a broadly trained academic with >20 years experience in higher education, management of federally-funded sponsored research programs, teaching undergraduate and graduate students, and science outreach to K-12 schools. For the past 6 years I have led an academic unit at a land-grant R1 institution and managed a budget of app. 8 million dollars/year. My research centers around a plant chemical signaling language, which is important for use and sensing of phosphate, a limited and critical nutrient for plants.

Education and Training

1985 B.S. Biology, Auburn University, Auburn, AL
1991 Ph.D. Biochemistry, Case Western Reserve University, Cleveland, OH
1991-1996 NSF Postdoctoral Fellow, University of California, Berkeley, CA

Professional Experience

2015- present Professor and Head, Department of Biochemistry, Virginia Tech
2012- 2015 Professor, Department of Biochemistry, Virginia Tech
2014 Visiting Researcher, Instituto Gulbenkian de Ciencia, Lisbon, Portugal
2005-2012 Associate Professor, Department of Biochemistry, Virginia Tech
1998-2005 Assistant Professor, Department of Biochemistry, Virginia Tech.
1996-1998 Assistant Professor, Department of Biology, Bucknell University

Honors and Professional Activities

2020 Site Review Team, Department of Energy, PRL, Michigan State University
2019-2020 Member, Provost's Committee on Graduate Education
2019 Site Review Team, Department of Energy, Brookhaven Lab, NY
2018-2019 President's Committee on Gender (Gender@VT)
2018 Site Visit Team, National Institutes of Environment and Health, RTP, NC
2017-2018 Co-Head, Department's Head Executive Council, Virginia Tech
2016 Chair, Search Committee for Director, School of Plant Sciences, Virginia Tech
2015 Chair and Organizer, Gordon Research Conference on Plant Lipids
2015-2018 Advisory Board, NSF EPSCoR Research Infrastructure Program: Plant High Throughput Phenotyping and Molecular Imaging Consortium (5 institutions)
2015 Member, ICTAS Ag, Land, Water and Biology grants panel, Virginia Tech
2014 Andy Swiger Land-Grant Award, Virginia Tech
2014 College representative, Promotion and Tenure Committee, Virginia Tech
2014 CALS VT-NC Regional Collaborative grants program panel
2012-2013 Chair, Promotion and Tenure Committee, Biochemistry, Virginia Tech
2008-2015 Member, Promotion and Tenure Committee, Biochemistry, Virginia Tech
2011-2015 Advisory Board member, Biochemistry, Virginia Tech
2013 Lead 21 participant (Leadership training for land-grant institutions)
2013-2014 Promotion and Tenure Committee, Agricultural, Leadership and Community Education department, Virginia Tech
2013-2014 Common book selection committee, Virginia Tech
2012-2013 Panel member, NSF Integrative Biology (IOS) Panel
2011-2015 Editor, Frontiers in Plant Physiology
2011 Consultant on Mid-Scale Research, National Science Board, NSF
2011 Faculty Search Committee, Crop, Soil, Environmental Sciences
2010 Co-Chair Faculty Search Committee, (Vector-borne disease) Biochemistry
2010, 2016 Chair, US Department of Agriculture NC-1168 Photosynthesis Research Group
2009-2011 Panel member, NSF Signal Transduction Panel
2008-2011 Chair, Awards Committee, Biochemistry

2008	CALS Taskforce on Professional Development
2007-2008	Director, Molecular Plant Sciences Graduate Program, Virginia Tech
2006-2009	Panel member, NSF Signal Transduction Panel
2006-2007	Panel member, US Department of Agriculture Plant Stress Panel
2006-2009	Treasurer, Sigma Xi, Blacksburg chapter
2006	Wilkins-Fralin Fellowship Panel, Virginia Tech
2005	Faculty Search Committee (cell biology), Biological Sciences
2005	Faculty Search Committee (proteomics), Biochemistry
2005	Faculty Search Committee (bioinformatics), Computer Science
2005	Goldwater Scholarship panel
2005	Co-Organizer, Plant Lipid-Mediated Signaling International Meeting
2005-present	Member, US Department of Agriculture NC-1168 Photosynthesis Research Group
2004-2006	Chair, Plant Model Systems Review Committee, The United States-Israel Binational Agricultural Research and Development Fund (member in 2004-2005)
2004-2006	Member, Graduate Committee, Biochemistry
2003-2004	CALS Biological Sciences Task Force
2002-2004	Committee on Academic Policy and Procedures, CALS
2001-2002	Panel member, US Department of Agriculture Plant Biochemistry Panel
1998-2003	Member, University Radiation Safety Committee
2001-2004	Chair of the Interdepartmental Plant Physiology Program
1998-2003	Member, University Greenhouse Committee
1998-2002	Faculty Panel Member of Undergraduate Honor System
1998-1999	Fralin Biotechnology Faculty Search Committees (plant molecular biology)
1996	Outstanding Advisor, Bucknell University

Current Funding. I have two currently funded projects including a project focused on phosphate remediation from soil and water, and a National Institute of Food and Agriculture funded project: Experiential Learning (SURF) project to increase the Ag workforce with training that spans both basic and applied plant sciences. My work has been previously funded by the National Science Foundation (Inositol pyrophosphates signaling in plants) and USDA, as well as smaller foundations. I lead a transdisciplinary group of scientists and engineers interested in phosphate reclamation/recycling, and have one provisional patent, and one patent in the pipeline; both are focused on phosphate mitigation.

Current Outreach in Science Education: Since 2005 I have visited Virginia high school classrooms and a total of 120 teachers and over 5800 high school students have designed experiments using my lab's Arabidopsis mutants in an inquiry-based learning project called the Plant Research and Education program (PREP).

Teaching Focus: As an administrator I now teach less often. In 2018 I taught a large major's Biochemistry course, which I taught every other year for many years. In Spring 2020 I taught a class on the biochemistry of Covid-19 to graduate students. To help increase face to face teaching during Fall 2020, I taught two small sections of an Oxford style tutorial for Biochemistry honor's students, also focused on Covid-19. In the past I have taught courses on major's biochemistry, biotechnology, professional development and graduate courses in molecular biology.

Administrative Focus: Guiding growth in the department of Biochemistry's faculty, with recent hires in vector-borne disease (3), enzymology (1) and computational biochemistry (1); guiding growth of graduate and sponsored research programs; re-instating an accelerated BS/MS degree program; developing impactful Inclusion and Diversity programs to increase sense of community and sense of belonging of diverse undergraduate and graduate students; increasing experiential learning and quality advising for students; and leading the department heads' executive council (2018-2019).

Publications

- Cridland, C. and Gillaspay, G. Inositol Pyrophosphate Pathways and Mechanisms: What Can We Learn from Plants? *Molecules* 25(12):2789. doi: 10.3390/molecules25122789.
- Freed, C., Adepoju, O. and Gillaspay, G. 2020. Can Inositol Pyrophosphates Inform Strategies for Developing Low Phytate Crops? *Plants* 9(1):115 DOI: 10.3390/plants9010115.
- Adepoju, O., Williams, S. P., Craige, B., Cridland, C.A., Sharp, A., Brown, A., Land, E., Perera, I.Y., Mena, D., Sobrado, P. and Gillaspay, G. Inositol Trisphosphate Kinase and Diphosphoinositol Pentakisphosphate Kinase Enzymes Constitute the Inositol Pyrophosphate Synthesis Pathway in Plants. *BioRxiv*, doi: <https://doi.org/10.1101/724914>
- Erickson, F.L., Baskerville, A., Donahue, J. and Gillaspay, G. Identification of a WD-repeat protein that binds and activates the deubiquitinase UBP3 from *Arabidopsis thaliana*. *BIOS. In press.*
- Fleet CM, Yen JY, Hill EA, Gillaspay GE. Co-suppression of AtMIPS demonstrates cooperation of MIPS1, MIPS2 and MIPS3 in maintaining *myo*-inositol synthesis. *Plant Mol Biol.* 2018 Jun;97(3):253-263. doi: 10.1007/s11103-018-0737-6.
- Zhang Q, van Wijk R, Shahbaz M, Roels W, Schooten BV, Vermeer JEM, Zarza X, Guardia A, Scuffi D, García-Mata C, Laha D, Williams P, Willems LAJ, Ligterink W, Hoffmann-Benning S, Gillaspay G, Schaaf G, Haring MA, Laxalt AM, Munnik T. *Arabidopsis* Phospholipase C3 is Involved in Lateral Root Initiation and ABA Responses in Seed Germination and Stomatal Closure. *Plant Cell Physiol.* 2018 Mar 1;59(3):469-486. doi: 10.1093/pcp/pcx194.
- Gillaspay, G and Perera, I. Communicating the language of plants through inositol phosphates. *Research Features*, 2017.
- Gillaspay G (2016) Plant Development and Physiology, in *Plant Biotechnology*. editor: Neil Stewart. Publisher: John Wiley & Sons. pp78-105.
- Williams, S., Gillaspay, G. and Perera, I. (2015) Biosynthesis and possible functions of inositol pyrophosphates in plants. *Front. Plant Sci.*, doi: 10.3389/fpls.2015.00067
- Yen J., Tanniche, I., Fisher, A., Gillaspay, G., Bevan, D., and Senger, R. (2015) Designing metabolic engineering strategies with genome-scale metabolic flux modeling. *Advances in Genomics and Genetics*, 5:93-105.
- Nourbakhsh, A., Collakova, E. and Gillaspay, G. (2015) Characterization of the Inositol Monophosphatase Gene Family in *Arabidopsis*. *Front Plant Sci.* doi: 10.3389/fpls.2014.00725
- Desai M, Rangarajan P, Donahue JL, Williams SP, Land ES, Mandal MK, Phillippy BQ, Perera IY, Raboy V, Gillaspay GE. (2014) Two inositol hexakisphosphate kinases drive inositol pyrophosphate synthesis in plants. *Plant J.* 80(4):642-53.
- Williams SP, Rangarajan P, Donahue JL, Hess JE, Gillaspay GE. (2014) Regulation of Sucrose non-Fermenting Related Kinase 1 genes in *Arabidopsis thaliana*. *Front Plant Sci.* J0;5:324.
- Gillaspay G. (2013). The Role of Phosphoinositides and Inositol Phosphates in Plant Cell Signaling. Capelluto D (editor), In *Lipid-Mediated Protein Signaling*, *Adv Exp Med Biol.* 991:141-57. Springer Science & Business Media, LLC.
- Golani Y, Kaye Y, Hassidim M, Ercetin M, Gillaspay G and Levine A. (2013) Inositol Polyphosphate Phosphatidylinositol 5-phosphatase 9 (At5PTase9) controls plant salt tolerance by regulating endocytosis. *Mol Plant.* 6:1781-94.
- Donahue J, Ercetin M, Gillaspay G. (2013) Assaying Inositol and Phosphoinositide Phosphatase Enzymes. Heilmann I and Munnik T (eds.), *Methods Mol Biol.* 2013;1009:175-85.
- Torrens-Spence MP, Liu P, Ding H, Harich K, Gillaspay G, Li J. (2013) Biochemical evaluation of the decarboxylation and decarboxylation-deamination activities of plant aromatic amino acid decarboxylases. *J Biol Chem.* 288(4):2376-87.
- Alford, S, Rangarajan, P, Williams, S, and Gillaspay, G. (2012) Myo-inositol oxygenase is required for responses to low energy conditions in *Arabidopsis thaliana*, *Frontiers in Plant Physiology* 2012;3:69.
- Gillaspay, GE. (2012) The cellular language of myo-inositol signaling, *New Phytologist* 192, 823- 839.
- Torrens-Spence, MP, Gillaspay, G, Zhao, B, Harich, K, White, RH. and Li, J. (2012) Biochemical evaluation of a parsley tyrosine decarboxylase results in a novel 4 hydroxyphenylacetaldehyde synthase enzyme, *Biochemical and biophysical research communications* 418, 211-216.
- Kaye Y, Golani Y, Singer Y, Leshem Y, Cohen G, Ercetin M, Gillaspay G, Levine A. (2011) Inositol

- Polyphosphate 5-phosphatase7 regulates production of reactive oxygen species and salt tolerance in Arabidopsis. *Plant Physiology* 157:229241.
- Donahue, JL, Alford, SR, Torabinejad, J, Kerwin, R, Nourbakhsh, A, Ray, WK, Hernick, M, Huang, X, Lyons, B, Hein PP, and Gillasp, GE. (2010) The Arabidopsis thaliana Myo- Inositol 1-Phosphate Synthase1 Gene Is Required for Maintenance of Myo-inositol Synthesis and Suppression of Cell Death. *The Plant Cell* 22: 888-903.
- Gillasp, GE (2010) The Polyphosphoinositide Phosphatases in “Lipid Signaling in Plants”. Springer; ed: T. Munnik.
- Torabinejad J, Donahue J, Gunsekera BN, Allen-Daniels M and Gillasp, GE (2009) VTC4 is a bifunctional enzyme that impacts ascorbic acid biosynthesis in plants. *Plant Physiology* 150:951-961.
- Fleet, CM, Ercetin, ME, and Gillasp, GE (2009) Inositol phosphate signaling and gibberellic acid. *Plant Signaling & Behavior* 4:73-74.
- Ananieva, EA, Gillasp, GE (2009) Switches in nutrient and inositol signaling. *Plant Signaling & Behavior* 4: 304-306.
- Ananieva EA, Gillasp, GE, Ely A, Burnette RN, and Erickson FL (2008) Interaction of the WD40 Domain of a Myo-inositol Polyphosphate 5-Phosphatase with SnRK1 Links Inositol, Sugar, and Stress Signaling. *Plant Physiology* 148:1868-82.
- Ercetin, ME, Ananieva, EA, Safae, NM, Robinson, JY, and Gillasp, GE (2008) A phosphatidylinositol phosphate specific myo-inositol polyphosphate 5-phosphatase required for seedling growth. *Plant Molecular Biology* 67:375-388.
- Gunsekera B, Torabinejad, J, Robinson, JY, and Gillasp, GE (2007) The inositol polyphosphate5-phosphatases are required for regulating seedling growth. *Plant Physiology* 143:1408-1417.
- Gillasp, GE, Ercetin, ME, and Burnette, RN (2004) Inositol Metabolism In Plant Cells: A Genomics Perspective. In *Advances in Plant Physiology, Volume VII*; editor: A. Hemantaranjan, Publisher: Scientific Publishers, India, pp. 145-158.
- Torabinejad, J and Gillasp, GE (2004) Functional Genomics of Inositol Metabolism. In *Subcellular Biochemistry Volume 39: Biology of Inositols and Phosphoinositides*. editors: Biswas and Majumder; Publisher: Springer, New York, pp. 47-70.
- Ercetin, ME and Gillasp, GE (2004) Molecular characterization of an Arabidopsis phospholipid-specific inositol polyphosphate 5-phosphatase. *Plant Physiology* 35:938-946.
- Styer, J, Spence, J, Keddie, J and Gillasp, GE (2004) Genomic organization and regulation of the LeImp-1 and LeImp-2 genes encoding myo-inositol monophosphatase in tomato. *Gene* 326: 35-41.
- Burnette, RN, Gunsekera, B and Gillasp, GE (2003) An IP3 signal terminating gene from Arabidopsis can alter aba signaling. *Plant Physiology* 132:1101-1109.
- Berdy, S, Kudla, J, Gruissem, W and Gillasp, GE (2001) Molecular characterization of At5PTase1, an inositol phosphatase capable of terminating IP3 signaling. *Plant Physiology* 126: 801-810.
- Gillasp, GE and Gruissem, W (2001) Li⁺ induces hypertrophic growth and downregulation of IMP activity in tomato. *Journal of Plant Growth Regulation* 20: 78-86.
- Gillasp, GE (2001) A change of heart. finding the right balance. *Plant Physiology* 127: 377- 378.
- Strahl, ED, Gillasp, GE, Falkinham, JO (2001) Fluorescent acid-fast microscopy for measuring phagocytosis of Mycobacterium avium, Mycobacterium intracellulare, and Mycobacterium scrofulaceum by Tetrahymena pyriformis and their intracellular growth. *Applied Environmental Microbiology* 67: 4432-4439.
- Gillasp, GE, Keddie, J, Oda, K and Gruissem, W (1995) Plant inositol monophosphatase is a lithium-sensitive enzyme encoded by a multigene family. *Plant Cell* 7:2175-2185.
- Gillasp, GE, Miller, R, Samols, D, and Goldthwait, D (1993) Antigenic and differentiative heterogeneity among human glioblastomas. *Cancer Letters* 68: 215-224.
- Gillasp, GE, Narita, J, Dean, S, Loraine, A, Schmitt, D and Gruissem, W (1993) The role of HMGCoA Reductase in Tomato Fruit Development. In *The Molecular Biology of the Tomato*, editor: J. Yoder, Technomic Publishing, Lancaster, PA, pp.107- 117.
- Gillasp, G, Ben-David, H, and Gruissem, W (1993) Fruits: A Developmental Perspective. *Plant Cell* 10:1439-1451.
- Gillasp, GE, Samols, D, Mapstone, T, and Goldthwait, D (1992) Transcriptional patterns of growth factors

and proto- oncogenes in human glioblastomas and normal glial cells. *Cancer Letters* 65: 55-60.
Press, R, Misra, A, Gillaspay, GE, Samols, D, and Goldthwait, D (1989) Control of expression of C-sis mRNA in human glioblastoma cells by phorbol ester and transforming growth factor β . *Cancer Research* 49: 2914-2920.

Patents

U.S. Provisional Application No. 63/028,970. Title: Redacted. Inventors: Glenda Gillaspay and Catherine Freed

U.S. Provisional Application filed. Title: Utilizing Slow-Releasing Fertilizer processes from Phosphate-Hyperaccumulating plants to remediate phosphate pollution. Inventors: Glenda Gillaspay, Catherine Freed, Phoebe Williams, Zhiwu Wang

Advising

Postdoctoral Scholars:

Branch Craige, current Research Scientist in my lab
Phoebe Williams, Assistant Professor, College of William and Mary, VA
Mihir Mandal, Assistant Professor at NCAT, NC
Tatiana Boluarte, Research Scientist, Virginia Tech
Jonathon Watkinson, Instructor, Virginia Tech
Javad Torabinejad, Cooperative Extension, Virginia Tech
Bhadra Gunsekera, deceased

Graduate students advised (17 total):

Jean Styer M.S., Research scientist, Monsanto
Michael Goley, M.S., Research scientist, Monsanto
Ryan Burnette, PhD, entrepreneur and owner, Alliance Biosciences
Mustafa Ercetin, PhD, Dallas City Schools Science Coordinator
Shannon Alford PhD, Clemson University Core Lab Director
Elitsa Ananieva PhD, Professor at Des Moines University
Jenna Hess M.S., executive at Alliance Biosciences
Aida Nourbaksch PhD, M.D. medical resident Washington University, MO
Padma Rangarajan M.S., formerly employed by Virginia Tech
Natasha Safae M.S.
Jui Yen, Ph.D., postdoc at Stanford, currently in a start-up
Phoebe Williams, Ph. D., faculty at William and Mary, VA
Olesegun Adepoju, Ph.D., working in biotech sector
Alexander Tolbert, M.S., Ph.D. student at U. Pennsylvania
Ryan Antal, M.S., employed in the Biotechnology sector
Caitlin Cridland, current Ph.D. student
Catherine Freed, current Ph.D. student

Sabbatical Visitors

Dr. John Kowalski of the Roanoke Governor's School in 2004.
Dr. Asmara al-Qaradawi from Qatar University in 2006
Dr. F. Les Erickson, Salisbury University, Maryland in 2012. Dr. Erickson received a special RET award from NSF for his sabbatical work in my lab.

Undergraduate Advising

I have been active in advising and mentoring undergraduate students. Prior to 2015, the Biochemistry department assigned every undergraduate to a faculty advisor. I have advised 3 cohorts of Biochemistry majors including 35 students from 1999-2003, 43 students from 2004-2009 and 79 students who started at Virginia Tech in 2010.

A second component of undergraduate advising is the mentoring of undergraduate students within my lab (48 total over my career). My group has been very active in this area, usually hosting between 2 and 4 undergraduate students each year. This has culminated in five undergraduates earning co-authorship on published papers, three undergraduates from my lab have given presentations at national meetings, and seven more have presented their work at regional conferences.

Former Undergraduate Researchers (selected out of 46 total)

- Daniel Neighbors, 2013-2014. Metabolic engineering of cellulose pathway in plants. Dan was a Sciencering fellow and is pursuing a MS in Chemical Engineering at the University of Virginia.
- Steven Pisano, 2012-2013. Analysis of differential splicing of 5PTase13. PhD student at University of Chicago.
- Caitlin O'Connell, 2013. Growth of P80 mutants. Patent Attorney
- Tyler Stewart, 2011. Analysis of double and triple 5PTase mutants and expression of the 5PTase13 promoter in various 5PTase mutant lines. PhD from University of Alabama in Birmingham, now in a postdoc.
- Steven Murphy, 2011. Production of P80 and PBP1 antibodies. Now an M.D.
- Christina Perry, 2010. Expression patterns of Arabidopsis 5PTase genes. MD, PhD, now at Stanford.
- Matthew Allen-Daniels, 2009. Expression of Inositol Monophosphatase proteins in Arabidopsis thaliana. Mr. Daniels is a co-author on a published paper from the lab. PhD student VCU.
- Rachel Kerwin, 2007. Subcellular Location of the Myo-Inositol Phosphate Synthase proteins. Earned PhD from the University of California, Davis.
- Pyae Hein, 2006. The Impact of Inositol Metabolism on Production of an Animal Nutrient and Environmental Pollutant: Inositol Hexakisphosphate. earned Ph.D. at the University of Wisconsin.
- Nicole Fontaine, 2006. The Impact of Salt on Myo-Inositol metabolism Mutants. Ms. Fontaine is employed as a research technician at the University of California.
- Jamille Robinson, 2006. Identification and Characterization of Inositol 5-Phosphatase Mutants. Earned M.S. at Vanderbilt University, now an entrepreneur in the cosmetics industry.
- Diane Kanter, 2004. NOS signaling and InsP3. Earned PhD from Vanderbilt.
- Kathy Yang, 2003. Phylogenetic Analysis of 5PTase proteins. Ms. Yang is employed by the Biotechnology company, Regeneron, in New York.
- Margaret Pauls, 2002. Examination Of Antisense At5PTase1 Transgenic Plants. Ms. Pauls earned an M.S. from Illinois University and is now a research technician with the USDA.
- Jeffrey Butler, 2002. Localization of At5PTase1. Mr. Butler earned an M.S. from the University of Colorado and is now employed there as a research technician.
- Michelle Ellis Anderson, 2002. Light Signal Transduction and InsP3. Ms. Anderson is now a research technician in the U.K.
- Jeremiah Spence, 2001. Expression of the LeIMP2 promoter. Multicultural Academic Opportunity (MAOP) Program fellow. Mr. Spence is a co-author on one published paper. He earned an M.S. at Georgia State University and is employed in the health sector.
- Katherine Hubbard Pedone, 2001. Antisense Suppression of Myo-Inositol Phosphate Synthase Isoforms in Transgenic Arabidopsis thaliana. Earned PhD from Emory.
- Elizabeth Holbrook, 2000. Expression of Myo-Inositol Phosphate Synthase Isoforms in Arabidopsis thaliana. Ms. Holbrook is now employed in the biotechnology sector.
- Kristin Fisher, 1999. Hairy-Root Cultures of Transgenic Tomato. Ms. Fisher is now a 7th Grade Science teacher in Virginia Beach, VA.
- Nathan Saucier, 2000. Salt Tolerance in Plants. Dr. Saucier earned a M.D. from Eastern Virginia Medical School and is now a practicing physician.
- Michelle Fornaratto Waldman, 1997. InsP₃ and control of catalase activity. Ms. Waldman earned an M.S. from Rutgers University and is now an Associate Scientist at Celgene.

Extramural Grant Funding

USDA NIFA, Equipping a New Generation of Plant Scientists to Solve Global Food Security: An Interdisciplinary Summer REEU Program; \$420,670. 2019-2023

USDA NIFA, Securing our Food: a Translational Experience for Undergraduate Students in Plant Sciences, \$270,581 2015-2019

HHMI Inclusive Excellence. Howard Hughes Medical Institute. \$24,900. 05/01/2019-08/31/2020; note that this is a subaward to my department.

NSF, Collaborative Research: Modeling the Regulatory Network of InsP₆ Signaling in Plants, \$186,809 2016-2019

NIFA, PI along with co-PIs Imara Perera and Brian Phillipy (NC State) "Controlling senescence and stress responses in cotton" 9/1/13- 11/31/16 \$495,896

NSF, PI along with co-PIs Imara Perera (NC State) and Victor Raboy (USDA) "Collaborative Research: Diphospho- and Triphospho-Inositol Phosphates in Plants" 1/1/11- 03/31/16 \$702,415

DOE, 2015 Plant Lipids GRS/GRC, \$9,990.

NSF, Meeting on Plant Lipids GRS/GRC, \$9,942

NSF, sole PI "Plant Cell Communication and Inositol Trisphosphates" 9/01/07-08/31/11 \$536,339

NSF, sole PI "Inositol Synthesis and Catabolism in Plants" 9/1/03-8/31/08 \$674,150

USDA, sole PI "Biochemistry of Signal Termination in Plants" 12/01/03-11/30/06 \$273,000

USDA, sole PI "Biochemistry of Signal Termination in Plants" 12/01/00- 11/30/03 \$180,000

NSF, sole PI "Research Supplements to support students and high school teachers, 2003-2011 \$131,735 (total between multiple supplement awards)

Jeffress Memorial Trust, sole PI "Inositol Metabolism in Plants" 7/01/03-6/30/04 \$15,000

Commonwealth Health Research Board, "Isolation of Genes for Transgenic Production of a Diabetes Treatment" 7/01/00-12/01/02 \$104,757

Jeffress Memorial Trust, "Signal Termination in Plants" 7/01/00-6/30/02 \$45,000

NSF, Postdoctoral award in W. Gruissem's lab, "Expression of HMGR isoforms in tomato" 1993-1994 \$135,000

Leadership Efforts on Funding Large Projects

GK-12: Power of Plants (PoP): Translating the Genomics of Agriculture into High Schools. PI: J. McDowell. Co-PIs: Gillaspay and E. Dolan. 2010. NSF. Total Amount requested: \$2,306,522. This project was funded, however, the GK-12 program was terminated by NSF before our award began.

Southeastern Regional Solar Fuels Center (SUN2Fuels) PI: F. Ablegovar. Co-PIs: Gillaspay and others. 2010, DOE. Total Amount requested: \$10,000,000. I developed the education and career development plans for this project.

EFRI-HyBi Preliminary Proposal: Reprogramming of multi-cellular organism metabolic pathways for

hydrocarbon production. PI: J. Barone. Co-PIs: Gillaspy, and C. Lawrence. 2009 NSF. Total Amount requested \$1,994,634. I developed education and career development plans.

Science and Technology Center for Co-Design of Renewable Natural Products. PIs: Nessler C, Barone, J, Cramer, C, Gillaspy, G and J. Jelesko. 2009. NSF. Total Amount requested: \$25,000,000. I was the organizer for this NSF Centers pre-proposal.

Although these proposals were not funded, they helped me forge collaborations with engineers and laid the foundation for future collaborative Life Science/Engineering efforts.

Internal Competitive Grant Proposals Funded (included as evidence of transdisciplinary efforts)

A Transdisciplinary Approach to Phosphorus Reclamation. Institute for Critical Technology and Applied Science (Virginia Tech). \$160,000, 07/01/19 – 06/30/21

Systems metabolic engineering of an energy-sensing network to increase plant productivity. Program: CALS Regional Collaborations. 2014-2016. PIs: Gillaspy, Senger, Perera. Total: \$98,455

Building a Bridge for Innovative, Interdisciplinary, STEM-based Educator Scientist Partnerships. Program: College of Agriculture and Life Sciences PIs: Gillaspy, Lally, Hopkins, Moore, McDowell, Collver (Blacksburg High school) Duration: 2013-2014 Total: \$44,000

Integrating the Arts into Innovative, Interdisciplinary, STEM-based Educator Scientist Partnership. Program: Institute for Creativity, Arts and Technology PIs: Gillaspy, Gindlesberger, Lally, Collver (Blacksburg High school) Duration: 2013-2014 Total: \$8,900

Transformation of a Traditional Local Secondary Agricultural Education Program through the Integration of Inquiry Based Teaching Methods and a Science Based Laboratory Facility: A Case Study Program: College of Agriculture and Life Sciences
PI: Donna Moore, Co-PIs: Gillaspy, Rudd, Kennelly, Burnette, Seibel. Duration: 2010-2011 Total: \$45,440

Model-guided engineering of Arabidopsis for increased cellulose production
Co-PIs: Gillaspy and Ryan Senger (Biological Sciences Engineering) Program: Institute for Critical Technologies and Science. Duration: 2012-2014 Total: \$98,928

Model-guided engineering of Arabidopsis for increased cellulose production
Co-PIs: Gillaspy and Ryan Senger (Biological Sciences Engineering). Program: Biodesign and Bioprocessing and Research Center. Duration: April 2010 –March 2012. Total: \$64,528

Functional Genomics of Plant Homeodomain Proteins. Program: ASPIRES. PI: Gillaspy Duration: 5/01/04-4/30/05. Total: \$49,120.

Developing a toolbox of novel photoexcitable probes for studying disease-related proteins Program: ASPIRES. PI: Sunyoung Kim, Co-PIs: Gillaspy, Bevan, Walker, and Wojick Duration: 2003. Total: \$56,400.

Purchase of a Quantitative PCR System shared by users campus-wide. Program: ASPIRES PI: Shirley Luckhart. Co-PIs: Gillaspy, Tu. Duration: 2000. Total: \$40,000.

Small Virginia Tech grants for undergraduate student support

MAOP Summer Research Internship Program for Minorities, 1999, 2001, 2004, 2015 \$6,000 total.

MEAMP (Mid-eastern Alliance for Minority Participation), 2003, \$1,000.

Biological Sciences Initiative Awards, Fall 1999, \$500; Fall 2001, \$750; Spring 2002; \$1,500.

Graduate Program Development

In 2005 I participated in the development of the first Molecular Plant Science graduate recruiting efforts, along with several other faculty. This effort developed into the current Molecular Plant Sciences program. As part of this the faculty developed a course GRAD 5515, which is a 3 hour laboratory research rotation course offered in both Fall and Spring semesters. I have been active in hosting students in GRAD 5515, and for one year I organized the course as the Director of the MPS program (2006-2007). I recruited the largest class of seven graduate students and secured internal funding for this program. I was Director in 2007-2008 and continue to collaborate on external funding efforts for the program. In 2011, Dr. David Schmale and I produced a set of recruiting films for MPS. In addition, my development of the Professional Development course (BCHM 5984) was designed to foster a shared experience in professional development for Molecular Plant Sciences graduate students. Lastly, I have participated or led multiple efforts to secure extramural funding for the Molecular Plant Sciences graduate program.

Outreach Activities

Summary: With these science outreach activities I engage high school biology students, 9-12 year olds, and teachers. I feel these are important efforts that support the outreach mission of a land-grant Ag institution.

Blacksburg High School STEM Lab Partnerships: In 2013 CALS and ICAT funds were used to develop science and art partnerships at Blacksburg High School (BHS) in the BHS STEM lab. The highlights of this project are development of a Chemistry “field trip” that engages BHS students in work related to my research on inositol phosphates, Biology field trips that engage students in cell imaging, photography and film experiences with Hans Gindlesberger (School of Visual Arts), various research projects by BHS students, and a BHS campus bird box project in which students collect data bearing on global climate change.

Partnership for Education and Research with Plants (PREP) summer meetings, 2009, 2011, 2012. Since my laboratory research projects focus on genes that plants use to regulate sensing and response to the environment, I have partnered with the PREP program (E. Dolan and D. Lally) to engage high school teachers and students in inquiry-based activities. During these summer meetings I met with teachers and other faculty for 1.5 days to discuss plans for the upcoming school year.

Visiting PREP classrooms. 2005-present. 176 classrooms have grown our mutant plants resulting in the engagement of ~5800 students and 120 teachers. I have visited 49 of these classrooms to help design experiments and interpret results, and members of my lab have visited an additional 30 classrooms, which gave them a chance to communicate about science and engage in educational activities. In addition, these activities give high school students the opportunity to meet a scientist, and to learn about on-going research first-hand. For many of these students it is the first time they have met a researcher engaged in basic science. As part of this effort I have been filmed in the classroom “modeling” problem-solving and also describing my lab’s research focus.

Kid’s Tech University Strawberry DNA Extraction, 2009-2014. DNA outreach activity and in partnership with the Biochemistry Club at Virginia Tech to engage over 300 9-13 year olds each year to learn about and extract DNA from strawberries during each year. Kid’s Tech University is an event organized by the Virginia Bioinformatics Institute.

Hosting High School Science Teachers, 2011. My laboratory acted as the host for summer research experiences of Rachele Rasco and Randy Webb, teachers at Carroll County High School, and Susanne Dana, a teacher at Blacksburg High School. Each teacher gained experience working with transgenic Arabidopsis plants engineered to express green fluorescent protein fusion proteins.

Darwin Celebration, October 2010. I organized this half day event to honor Cecilia Littleton, Charles Darwin's great granddaughter, who was our guest of honor. Several faculty gave short talks and students from public schools and the community were invited to participate in a strawberry DNA extraction.

Visit by students and teachers from St. Anne's Belfield School, 2009. Teachers and students from St. Anne's Belfield School toured the campus and presented their research as part of the Partnership for Research and Education in Plants. The event was organized by D. Lally; collaborators were E. Dolan, E. Collakova, J. Donahue.

Parent's Day Programs 2004, 2007-2009. I organized the showing of scientific films, and an exercise to extract DNA in the lab for parents visiting the Department of Biochemistry. Collaborators were D. Bevan, T. Sitz, R. White.

Inquiry-Based Elementary Science Lab Activity, 2006, 2007, 2009-2012. These activities activity took place in either third or fourth grade classrooms at Margaret Beeks Elementary School. Students designed their own plant abiotic stress experiment which was carried out in their classroom. I developed several handouts and a lab notebook for students to utilize in this activity. I also developed a web site that parents could visit to view their child's results.

Diversity Efforts

In my role as department head I have overseen a nascent program in the Diversity domain within my department. With a small grant from the Howard Hughes Medical Institute I formed a faculty study group to determine how to change our departmental climate for under-invited students in biochemistry. We developed two critical activities to create a sense of belonging, and to educate department members about microaggressions, biases, and gain skill in addressing these. Our first committee on Diversity has addressed several departmental climate issues, and we are beginning to see an impact. We have also begun to engage select undergraduate and graduate students to serve as Diversity advocates, to help with student/faculty communications. Lastly, I have hired a Communications specialist to help address the outward facing portions of the department, and to create vignettes, videos, etc. that better reflect our diversity.

Selected Invited Lectures (* = Students)

- Gillaspy, G. 2021. "Inositol Pyrophosphate Synthesis in Plants". International meeting on Inositol Phosphates: the more the merrier.
- Gillaspy G. 2020. " Diversity and Inclusion activities in an undergraduate-focused department of Biochemistry". American Society of Medical Biochemistry Department Heads (virtual presentation).
- Gillaspy, G. 2020. "Phosphate Sensing in Plants". NC1200 virtual meeting on Photosynthesis.
- Cridland, C.*, Drape, T., Marine, S., & Gillasp, G. 2020. "Taking a summer On-line research program on-line" ASPB international meeting (virtual).
- Cridland, C.*, Drape, T., Marine, S., & Gillasp, G. 2020. "Developing a mentorship program for graduate students involved in REUs/REEUs." In *Conference on Higher Education Pedagogy*.
- Gillaspy, G. 2019. "Advances in plant lipid signaling". Gordon Research Conference on Plant Lipids, Galveston, TX.
- Gillaspy, G. 2017. "Inositol Pyrophosphates in Plants". Gordon Research Conference on Plant Lipids, Galveston, TX.
- Gillaspy, G. 2014 " Inositol Pyrophosphates and Energy Signaling in Plants" North Carolina State University, Raleigh, NC.
- Gillaspy, G. 2014. " Inositol Phosphatases and Energy Signaling in Plants" Instituto Gulbenkian de Ciencia, Lisbon, Portugal
- Gillaspy, G. 2012. "Energy Sensing in Plants" Michigan State University, East Lansing, MI Gillasp, G. 2011. "Energy Sensing in Plants" National NC-1168 Photosynthesis Research Meeting, Michigan State University, East Lansing, MI
- Gillaspy G, Ananieva, E*, Hess, J*, Donahue, JL, Nourbakhsh, A*, Erickson, L, 2011. "Myo- Inositol and Energy Signaling In Plants" Gordon Research Conference on Plant Lipids, Galveston, TX.

- Gillaspy, G. 2011. "Inositol Signaling and Regulation of Protein Stability" University of North Texas, Denton, TX.
- Williams, P*, and Gillasp, G. 2011. "Inositol Signaling and Regulation of Protein Stability" Annual Meeting, American Society of Plant Biologists, Minneapolis, MN.
- Gillaspy, G. 2011. "Myo-Inositol and Energy Signaling" Gordon Research Conference on Plant Lipids, Galveston, TX.
- Gillaspy, G. 2010. "Inositol Synthesis in Plants" National NC-1168 Photosynthesis Research Meeting, Virginia Tech, Blacksburg, VA.
- Gillaspy, G. 2010. "Inositol Synthesis in Plants" National NC-1168 Photosynthesis Research Meeting, Virginia Tech, Blacksburg, VA.
- Gillaspy G. 2009. "Inositol and Nutrient Signaling" National NC-1168 Photosynthesis Research Meeting, Columbus, OH.
- Gillaspy G. 2009. "Inositol Signaling In Plants" Gordon Research Conference on Plant Lipids, Galveston, TX.
- Gillaspy G. 2009. "Inositol and Nutrient Signaling" National NC-1168 Photosynthesis Research Meeting, Columbus, OH.
- Gillaspy G, and Allen-Daniels, M**2007. "Cold Stress Growth and Localization of Inositol Monophosphatase (IMP) in Arabidopsis thaliana Mutants" 13th Annual McNair National Scholars Research Conference, Knoxville, TN.
- Safae, N*, Watkinson, J, Gillasp, G. 2007 "An Analysis Of The PHD-Finger Domain In Arabidopsis And Rice Using Bioinformatics, Functional Genomics And Biochemistry" American Society for Biochemistry and Molecular Biology National meeting, Washington, D.C.
- Hein P*, Torabinejad, J, Gillasp, G. 2006 "The Response of Inositol Metabolism Mutants to Stress" Virginia Academy of Science annual meeting, Blacksburg, VA.
- Gillaspy, G, Ely, A, Ananieva, E*, and F. Erickson. 2005. "Arabidopsis thaliana Inositol Polyphosphate 5-Phosphatase 13 May Link Inositol Signaling With Glucose Metabolism" International Conference on Plant Lipid-Mediated Signaling, Raleigh, NC.
- Gillaspy G. 2007. "Inositol Metabolism and Ascorbic Acid Synthesis" National NC-1168 Photosynthesis Research meeting, Lincoln, NE.
- Gillaspy, G. 2005. "The Secret Life Of Signaling Molecules" Fralin Biotechnology Conference, Blacksburg, VA.
- Gillaspy, G. 2005. "Functional Genomics of Inositol Signaling" International Conference on Plant Lipid-Mediated Signaling, Raleigh, North Carolina.
- Gillaspy, G. 2005. "Plants As Factories for Human Pharmaceuticals" Virginia Association Biological Educators Meeting, Blacksburg, VA.
- Gillaspy, G. 2004. "Getting Turned on By Plant Signal Transduction" Department of Biology, Salisbury University, Salisbury, MD.
- Gillaspy, G. 2004. "Terminating Signal Transduction in Plants" Department of Botany, North Carolina State University, Raleigh, NC.
- Gillaspy, G. 2003. "Terminating Signal Transduction in Plants" Department of Biology, Appalachian State University, Boone, NC.
- Gillaspy, G. 2003. "Terminating Signal Transduction in Plants" Virginia Bioinformatics Institute, Virginia Tech, Blacksburg, VA
- Gillaspy, G. 2003. "Signal Termination in Arabidopsis" Mid-Atlantic Plant Molecular Biology Society, Pawtuxent, MD.
- Gillaspy, G. 2003. "Using Plants to Treat Type II Diabetes" National Consortium for Specialized Secondary Schools of Mathematics, Science & Technology 15th Annual Conference, Roanoke, VA.
- Gillaspy, G. 2002. "Terminating ABA and Light Signal Transduction in Plants" Arabidopsis Regional Meeting, College Park, MD.
- Gillaspy, G. 2002. "Terminating Signal Transduction in Plants: Why Getting Turned Off Is As Important As Getting Turned On" Department of Plant Biology, Ohio State University, Columbus, OH.
- Gillaspy, G. 2002. "Signal Transduction in Plants" Department of Biology, Eastern Mennonite University, Harrisonburg, VA.
- Gillaspy, G. 2001. "Signal Termination in Plants: A new way to regulate signal transduction" Department of

- Genetics and Biochemistry, Clemson University, Clemson, SC.
- Gillaspy, G. 2001. "Signal Transduction and Termination in Plants" Department of Biology, James Madison University, Harrisonburg, VA.
- Gillaspy, G. 2001. "Signal Transduction and Termination in Plants" Department of Biology, Kansas State University, Manhattan, KS.
- Burnette, R* and Gillaspy, G. 2001. "A signal-terminating gene from *Arabidopsis thaliana*" Biochemistry and Molecular Biology Annual Meeting, Orlando, FL.
- Gillaspy, G. 2000. "Signal Transduction in Plants" Department of Biology, Radford University, Radford, VA.
- Holbrook, E*. and Gillaspy, G. 2000. "Expression of *Myo*-inositol Phosphate Synthase Isoforms in *Arabidopsis thaliana*" Virginia Academy of Science, Blacksburg, VA.
- Gillaspy, G. 1999. "An Arabidopsis Gene Which Encodes a Specific 5-Phosphatase Capable of Hydrolyzing IP₃" Annual Meeting, American Society of Plant Physiologists, Baltimore, MD.
- Gillaspy, G. and Gruissem, W. 1995. "Inositol Monophosphatase Multigene Family in Tomato" Keystone Symposia, Plant Signal Transduction, Hilton Head, SC.
- Gillaspy, G. and Gruissem, W. 1995. "The Lithium Sensitive Inositol Monophosphatases" Annual Meeting, American Society of Plant Physiologists, Charlotte, NC.
- Gillaspy, G. and Gruissem, W. 1992. "The role of HMGCoA Reductase in Tomato Fruit Development" Molecular Biology of the Tomato Meeting, Davis, CA.
- Gillaspy G. and Gruissem, W. 1991. "GTP-binding Proteins from Plants" Cold Spring Harbor Symposium, Plant Signal Transduction, New York.

SOCIETY MEMBERSHIPS

American Society of Plant Biology

American Society for Biochemistry and Molecular Biology