Curriculum Vitae

Notarization. I have read the following and certify that this *curriculum vita* is a current and accurate statement of my professional record.

Signature_____ Date_____

I. Personal Information

UID 112795024
Peer, Wendy Ann
5138 Plant Sciences Building
Department of Environmental Science and Technology
University of Maryland
College Park, MD 20742
wapeer@umd.edu; http://www.enst.umd.edu/people/faculty/wendy-ann-peer

Academic Appointments at the University of Maryland

August 2012 – present	Assistant Professor, Department of Environmental Science and Technology, University of Maryland, College Park
August 2013 – present	Affiliate, Department of Plant Science and Landscape Architecture, University of Maryland, College Park
May 2016 – present	Affiliate, Institute for Bioscience and Biotechnology Research, University of Maryland, College Park

Other Employment

2012 – present	Adjunct Assistant Professor, Department of Horticulture and Landscape Architecture, Purdue University
2009 – 2012	Assistant Professor, Department of Horticulture and Landscape Architecture, Purdue University
2009	Visiting Scientist, Institute of Experimental Botany, Academy of Sciences of the Czech Republic
2007 – 2012	Supervising faculty, Purdue Life Sciences Fluorescence Imaging Facility
2006 – 2009	Research Assistant Professor, Department of Horticulture and Landscape Architecture, Purdue University
2006	Visiting Scientist, Department of Plant Sciences, Oxford University, UK
2001 – 2006	Research Scientist, Department of Horticulture and Landscape Architecture, Purdue University
2001	Visiting Scholar, Department of Horticulture and Landscape Architecture, Purdue University
1997 – 2000	Postdoctoral Fellow, Molecular, Cell and Developmental Biology Department, University of California, Santa Cruz

Educational Background

Date	Degree	Institution
1996	Ph.D. Biology	University of California, Santa Cruz
1989	B.S. Chemistry (Honors)	California State University, Bakersfield
1989	B.S. Biology (Honors)	California State University, Bakersfield

Professional Certifications, Licenses, and Memberships

Weed Risk Assessment Analyst, USDA-APHIS, 2015
American Society of Plant Biologists 1999-present
American Institute for Biological Sciences 1995-1997
Society for Experimental Biology 2002-present
American Chemical Society 2014-present
American Academy for the Advancement of Science 2014-present
Weed Science Society of America 2013-present
Sigma Xi 1994-present
Sigma Delta Epsilon 1996-present
Phi Kappa Phi 2015-present
Grange since 1983

II. Research, Scholarly and Creative Activities
#post-doctoral researcher, ^graduate student, ^{x}undergraduate student, *corresponding author

II.A. Books

II.A.1 Books Edited

The Plant Plasma Membrane. (2010) Murphy AS, Peer WA, and Schulz B, eds. Springer-Verlag, Berlin.

II.A.2 Chapters

Carraro N#, Peer WA (2016) "Immunolocalization of PIN and ABCB Transporters in Plants", Environmental Responses in Plants, *Methods in Molecular Biology*, Paula Duque, ed. Springer. pp. 55-67.

Peer WA, Murphy AS, Taiz L. (2015) "Seed Dormancy, Germination, and Seedling Establishment." In *Plant Physiology and Development*, 6th ed. Taiz L, Zeiger E, Mouller IM, Murphy AS, eds. Sinaur Assoc., Inc., Sunderland, MA. pp. 513-552. *This was peer-reviewed by five experts in the field.*

Peer WA, Beveridge C, Busov V, Murphy AS, Taiz L. (2015) "Vegetative Organogenesis." In *Plant Physiology and Development*, 6th ed. Taiz L, Zeiger E, Mouller IM, Murphy AS, eds. Sinaur Assoc., Inc., Sunderland, MA. pp. 553-590. *This was peer-reviewed by five experts in the field.*

Peer WA, Monshausen G, Murphy AS, Taiz L. (2015) "Signals and Signal Transduction." In *Plant Physiology and Development*, 6th ed. Taiz L, Zeiger E, Mouller IM, Murphy AS, eds. pp. 407-446. Sinaur Assoc., Inc., Sunderland, MA. *This was peer-reviewed by five experts in the field.*

Peer WA, Sullivan J, Christie J, Murphy AS, Taiz L. (2015) "Signals from Sunlight." In *Plant Physiology and Development*, 6th ed. Taiz L, Zeiger E, Mouller IM, Murphy AS, eds. Sinaur Assoc., Inc., Sunderland, MA. pp. 447-476. *This was peer-reviewed by five experts in the field.*

Peer, WA. (2010) "Protein trafficking at the plasma membrane." In *The Plant Plasma Membrane*. (2010) Murphy AS, Peer WA, and Schulz B, eds. Springer-Verlag, Berlin. pp. 31-58.

Peer WA, Murphy AS (2008) "Flavonoid signaling: Targets of flavonoid action." In *The Science of Flavonoids*, E Grotewold, ed. Springer-Verlag, Berlin, 2nd edition.

Peer WA, Murphy AS (2006) "Flavonoid signaling: Targets of flavonoid action." In *The Science of Flavonoids*, E Grotewold, ed. Springer-Verlag, Berlin, 1st edition.

Blakeslee JJ, Peer WA, Murphy AS (2005b) MDR/PGP auxin transport proteins and endocytotic cycling. *Plant Cell Monographs: Plant Endocytosis* Springer, Berlin, pp. 159-176.

Peer WA*, Baxter IR, Richards EL, Freeman JL, Murphy AS (2005) Phytoremediation and hyperaccumulator plants. In *Molecular Biology of Metal Homeostasis and Detoxification.* Topics in Current Genetics Vol 14, Tamas M and Martinoia E, eds. Springer, Berlin, pp. 299-340.

II.B. Articles in Refereed Journals

#post-doctoral researcher, ^graduate student, [x]undergraduate student, *corresponding author

61. Zhang J^, Lin J, Harris C[x], Mastrotti Pereira F^, Wu F[x], Blakeslee JJ, Peer WA* (2016) DAO1 catalyzes temporal and tissue-specific oxidative inactivation of auxin in *Arabidopsis thaliana*. *Proceedings of the National Academy of Sciences USA*, 13: 11010–11015, www.pnas.org/cgi/doi/10.1073/pnas.1604769113

    My role was to direct the research, contribute to the experimental deign, interpretation of the data, and writing the manuscript. Oxidation in plants and auxin homeostasis is a major research focus of my lab. This article was recommended in Faculty of 1000 Prime.

60. Cossu A, Ercan D, Wang Q, Peer WA, Nitin N, Tikekar RV (2016) Antimicrobial effect of synergistic interaction between UV-A light and Gallic Acid against Escherichia coli O157:H7 in fresh-produce wash water and biofilm. *Innovative Food Science and Emerging Technologies*, DOI: 10.1016/j.ifset.2016.07.020

    I contributed to the experimental deign, method development, conducted research, interpreted data, and wrote the corresponding part of the manuscript. Flavonoids and their role oxidation is the major focus of my lab.

59. Yang H#, Wei H, Ma G^, Antunes MS, Vogt S, Cox J, Zhang X, Liu X^, Bu L, Gleber SC, Carpita NC, Makowski L, Himmel ME, Tucker MP, McCann MC, Murphy AS, Peer WA*. (2106). Cell wall targeted in planta iron accumulation enhances biomass conversion and seed iron concentration in Arabidopsis and rice. *Plant Biotechnology Journal* 14:1998-2009. doi: 10.1111/pbi.12557

    My role was to direct the research, contribute to the experimental deign, interpretation of the data, and writing the manuscript. This work is consistent with my research portfolio on metals and expertise in cellular trafficking. I am a co-I on the DOE grant that funded this work.

58. Lin C-Y, Jakes JE, Donohoe BS, Ciesielski PN, Yang H, Gleber S-C, Vogt S, Ding S-Y, Peer WA, Murphy AS, McCann MC, Himmel ME, Tucker MP, Wei H. (2016) Directed plant cell wall accumulation of iron: Embedding co-catalyst for efficient biomass conversion. *Biotechnology for Biofuels*, 9:225 DOI 10.1186/s13068-016-0639-2.

    I contributed to discussions of experimental design, data analyses and editing the manuscript. This was part of my DOE funded project.

57. Kriegel A, Andrés Z, Medzihradszky A, Krüger F, Scholl S, Delang S, Patir-Nebioglu MD, Gute G, Yang H, Murphy AS, Peer WA, Pfeiffer A, Krebs M, Lohmann JU, Schumacher K (2015) Job sharing in the endomembrane system: vacuolar acidification requires the combined activity of V-ATPase and V-PPase. *Plant Cell, DOI: 10.1105/tpc.15.00733*

    I contributed to the experimental deign, interpreting the data, writing the manuscript and reconciling the previous and current data and experimental methods to resolve a controversy in the field. My interests were the relationship of cellular trafficking and proton ATPases on plant growth and development and to resolve the controversy.

56. Voß U, Wilson MH, Kenobi K, Gould PD, Robertson FC, Peer WA, Lucas M, Swarup K, Casimiro I, Holman TJ, Wells DM, Péret B, Goh T, Fukaki H, Hodgman TC, Laplaze L, Halliday KJ, Ljung K,

Murphy AS, Hall AJ, Webb AAR, Bennett MJ. (2015) Lateral root organ initiation re-phases the circadian clock in *Arabidopsis thaliana*. *Nature Communications*, 6: 7641. DOI: 10.1038/ncomms8641

I contributed the experimental design for the circadian regulation of IAA and oxIAA accumulation, preparing the figures and writing the corresponding portion of the paper and editing the paper. Auxin oxidation and homeostasis is a major research focus of my lab.

55. Guan L, Murphy AS, Peer WA, Gan L, Li Y, Cheng Z-M (Max) (2015) Physiological and molecular regulation of adventitious root formation. *Critical Reviews in Plant Sciences* 34, 506-52.

I contributed to writing the paper. My interests were the role of auxin homeostasis in adventitious root development.

54. Peer WA*****, Jenness MK, Murphy AS. (2014) Measure for measure: determining, inferring and guessing auxin gradients at the root tip. *Physiolgia Plantarum* 151: 97–111. doi:10.1111/ppl.12182.

I contributed to the design, interpreting data and writing the paper. My interests were the role of auxin homeostasis in plant growth and development, a major research focus of my lab.

53.Yang H, Zhang X, Gaxiola RA, Xu G, Peer WA, Murphy AS. (2014). Over-expression of the Arabidopsis proton-pyrophosphatase AVP1 enhances transplant survival, root mass, and fruit development under limiting phosphorus conditions. *Journal of Experimental Botany*, 65: 3045-3053.

I contributed to the experimental design, conducted experiments, analyzed data and wrote the corresponding parts of the paper. My interests were the relationship of flavonoids, membranes and proton ATPases in plant growth and development.

52. Wei H, Yang H, Ciesielski PN, Donohoe BS, McCann MC, Murphy AS, Peer WA, Ding SY, Himmel ME, Tucker MP, Transgenic ferritin overproduction enhances thermochemical pretreatments in Arabidopsis, *Biomass and Bioenergy*, 72: 55-64.

I contributed to discussions of experimental design, data analyses and editing the manuscript. This was part of my DOE funded project.

51. Peer WA*****. (2013). From perception to attenuation: auxin signalling and responses. *Current Opinions in Plant Biology* 64: 2629-2639. DOI: 10.1016/j.pbi.2013.08.003.

My role was to conceptualize and write the paper. My interests were the cellular elements spanning across auxin perception that lead to auxin responses. My specific interest was the role of auxin oxidation and homeostasis in attenuation of auxin responses.

50. Peer WA*, Cheng Y, Murphy AS. (2013). Evidence of oxidative attenuation of auxin signalling. *Journal of Experimental Botany* 64: 2629-2639. DOI: 10.1093/jxb/ert152.

I contributed to the experimental design, directing research, interpreting the data, writing the manuscript. This is the major focus of my lab on flavonoids and their role oxidation, especially focusing on auxin oxidation, in plants.

49. Yu H, Karampelias M, Robert S, Peer W, Swarup R, Ye S, Ge L, Cohen J, Murphy A, Friml J, Estelle M. (2013) ROOT UVB SENSITIVE 1/WEAK AUXIN RESPONSE 3 is essential for polar auxin transport in Arabidopsis. *Plant Physiology* 162: 965-976.

My role was to contribute to experimental design, analyze experiments, and write the corresponding part of the paper. My interests were the genetic components that interface between auxin responses/transport and auxinic herbicides.

48. Knapp D, Peer WA, Conteh A[x], Diggs AR, Cooper BR, Glickman NW, Bonney PL, Stewart JC, Glickman LT, Murphy AS. (2013). Detection of herbicides in the urine of pet dogs following home lawn chemical application. *Science of the Total Environment* 456-457: 34-41.

I contributed to the experimental design and methods for extraction of herbicide residues from homeowner turf grass and urine from dogs and children based on EPA protocols, and directed the research, oversaw the experiments. I analyzed the data and wrote the corresponding part of the paper. My interests in this were the conditions contributing to the persistence of herbicides, and auxinic herbicides in particular, in the environment.

47. Yang H, Richter GL, Wang X, Młodzińska E, Carraro N#, Ma G^, Jenness M, Chao D-Y, Peer WA*, Murphy AS. (2012). Sterols and sphingolipids differentially function in trafficking of the Arabidopsis ABCB19 auxin transporter. *The Plant Journal* 74: 37-47.

    I contributed to conceptualizing, designing, and directing research, interpreting data and writing the article. My interests were in the lipid synthesis and trafficking with respect to stress and transport of oxidative compounds. (This article was revised and accepted while at UMD.)

46. Murphy AS, Peer WA. (2012). Vesicle Trafficking: ROP–RIC Roundabout. Current Biology 22, R576-R578.

    I contributed to conceptualizing and writing the article and designed and prepared the models in the figures, and this work represents my interests in cellular trafficking and functions.

45. Peer WA* (2012). Protein evolution: The enzyme perfected. Nature Chemical Biology 8: 607–608.

    I conceptualized and wrote the invited article and designed and prepared the figure.

44. Dweikat I, Weil C, Moose, S, Kochian L, Mosier N, Ileleji K, Brown P, Peer W, Murphy A, Tacheripour F, McCann M, Carpita N. (2012). Envisioning the transition to a next-generation biofuels industry in the Midwest. Biofuels, Bioproducts & Biorefining. 6: 376-386.

    My role was to contribute to conceptualizing and editing the article and my interests were in the sustainability of biofuels on brown fields and reclamation sites and without the use of prime agricultural land for biofuels through bioenergy crop improvement. I am a co-I on the DOE grant that funded this work.

43. Spartz AK, Lee, SH, Wenger JP, Gonzalez N, Itoh H, Inze D, Peer WA, Murphy, AS, Overvoorde P, Gray, WM. (2012). The *SAUR19* subfamily of SMALL AUXIN UP RNA genes promote cell expansion. *The Plant Journal* 70: 978-990.

    I contributed to designing and preforming experiments related to conditional nuclear localization of SAUR proteins, and my interest was the mechanism of light-induced nuclear relocalization and the effects on transcription. The connection is the localization of flavonoids to nuclear speckles, and auxin responses.

42. Kubeš M, Yang H, Richter GL, Cheng Y, Młodzińska E, Wang X, Blakeslee JJ, Carraro N, Petrášek J, Zažímalová E, Hoyerová K, Peer WA*, Murphy AS. (2011). The Arabidopsis concentration-dependent influx/efflux transporter ABCB4 regulates cellular auxin levels in the root epidermis. *The Plant Journal* 69: 640-654.

    I contributed to conceptualizing, designing, and directing research, interpreting data and writing the article. My interest was the roles of oxidative compounds and auxinic herbicides in auxin transport, as their role is an outstanding question.

41. Christie JM, Yang H, Richter GL, Sullivan S, Thomson CE, Lin J, Titapiwatanakun B, Ennis M, Kaiserli E, Lee OR, Adamec J, Peer WA**,** Murphy AS. (2011). phot1 inhibition of ABCB19 primes lateral auxin fluxes in the shoot apex required for phototropism. PLoS Biol. 9, e1001076.

    My role was to contribute to experimental design, writing the paper, modelling the phenomenon. My interest were in auxin homeostasis during tropic responses and also on phototropism as I had studied light-mediated responses as part of my dissertation.

40. Peer WA***,** Blakeslee JJ, Yang H, Murphy AS. (2011). Seven things we think we know about auxin transport. *Molecular Plant* 4: 487-504.

    I contributed to conceptualizing and writing the paper and modeling the phenomena. My interests were the cellular elements spanning across auxin perception that lead to auxin responses. My specific interest was the roles of oxidative compounds in auxin transport, as their role is an outstanding question.

39. Peer WA* (2011). The role of multifunctional M1 metallopeptidases in cell cycle progression. *Annals of Botany* 107: 1171-1181.

    One of the main areas of my research is metal-center proteins. I formulated and wrote the paper.

38. McLamore ES, Diggs A, Calvo Marzal P, Shi J, Blakeslee JJ, Peer WA, Murphy AS, Porterfield DM. (2010). Non-invasive quantification of endogenous root auxin transport using an integrated flux microsensor technique. *The Plant Journal* 63:1004-1016.

    I contributed to formulating and conducting the experiments and writing the paper, and my interest was the roles of oxidative compounds and flavonoids in auxin transport. Development of this microsensor was important for my future research.

37. Knöller AS, Blakeslee JJ, Richards EL, Peer WA, Murphy AS. (2010). Brachytic2/ZmABCB1 functions in IAA export from intercalary meristems. *J Exp Bot*. 61: 3689-3696.

    I contributed to interpreting the data and writing the paper. My interests are ABC proteins which may transport oxidative compounds.

36. Ge L, Peer W, Robert S, Swarup R, Ye S, Prigge M, Cohen JD, Friml J, Murphy A, Tang D, Estelle M. (2010). Arabidopsis ROOT UVB SENSITIVE2/WEAK AUXIN RESPONSE1 is required for polar auxin transport. *Plant Cell* 22: 1749-1761.

    My role was to contribute to experimental design, conduct and analyze experiments, and write the corresponding part of the paper. My interest was the roles of oxidative compounds in auxin transport.

35. Hosein FN#, Bandyopahyay A, Peer WA*, Murphy AS. (2010) The catalytic and protein-protein interaction domains are required for APM1 function. *Plant Physiology*. 152: 2158-2172.

    I contributed to formulating, designing, directing and conducting experiments, analyzing data and writing the paper, and identified the mutants. This is a main research focus of metal-center proteins.

34. Peer WA, Hosein FN^, Bandhyopadhyay A, Makam SN, Otegui M, Lee GJ, Blakeslee, JJ, Cheng Y, Titapiwatanakun B, Yakubov B, Bangari B, Murphy AS (2009) Mutation of the membrane-associated M1 protease APM1 results in embryonic and seedling developmental defects. *Plant Cell* 21: 1693-721.

    I contributed to formulating, designing, directing and conducting experiments, analyzing data and writing the paper, and identified the mutants. This is a main research focus of metal-center proteins.

33. Titapiwatanakun B, Blakeslee JJ, Bandyopadhyay A, Yang H, Mravec J, Sauer M, Cheng Y, Adamec J, Nagashima A, Geisler M, Sakai T, Friml J, Peer WA, Murphy AS. (2009). ABCB19/PGP19 stabilizes PIN1 in membrane microdomains in Arabidopsis. *Plant J*. 57: 27-44.

    I contributed to designing the experiments, writing the paper, modelling the phenomenon. I designed and directed the experiments for the revision. My interest was the roles of oxidative compounds in auxin transport.

32. Peer WA*, Murphy AS (2007) Flavonoids and auxin transport: Regulators or Modulators? *Trends in Plant Science* 12: 556-553.

    I contributed to designing, directing and conducting experiments, analyzing the data, writing the paper. My interest was the roles of flavonoids oxidative compounds in auxin transport. I developed a

new imaging technique for in situ speciation of flavonoids and their localizations, and showed that flavonoids were localized in nuclear speckles.

31. Rojas-Pierce M, Titapiwatanakun B, Sohn E-J, Fang F, Larive CK, Blakeslee JJ, Peer WA, Murphy AS, Raikhel NV. (2007) Inhibition of gravitropism by Gravacin is mediated by Arabidopsis P-glycoprotein19. *Chemistry and Biology (Cell Press)* 14: 1366-1376.

    I contributed to designing the experiments, interpreting data and writing the paper. My interest was in cellular trafficking and the roles of oxidative compounds in auxin transport.

30. Yang H, Knapp J, Koirala P, Rajagopal D, Peer WA, Silbart LK, Murphy A, Gaxiola RA. (2007) Enhanced phosphorus nutrition in monocots and dicots over-expressing a phosphorus-responsive type I H(+)-pyrophosphatase. *Plant Biotechnology Journal* 5: 735-745.

    I contributed to designing the experiments, interpreting data and writing the paper, and my interest was the roles of oxidative compounds and flavonoids in auxin transport.

29. Blakeslee JJ, Bandyopadhyay A, Lee OR, Mravec J, Titapiwatanakun B, Sauer M, Makam SN, Cheng Y, Bouchard R, Adamec J, Geisler M, Nagashima A, Sakai T, Martinoia E, Friml J, Peer WA*, Murphy AS (2007a) Interactions among PIN-FORMED and P-glycoprotein auxin transporters in *Arabidopsis thaliana*. *Plant Cell* 19: 131-174.

    I contributed to designing and directing the experiments, analyzing data and writing the paper and my interests were the roles of flavonoids and oxidative compounds in auxin transport.

28. Carrera E, Holman T, Medhurst A, Peer WA, Schmuths H, Footitt S, Baker A, Theodoulou FK, Holdsworth MJ. (2007). Gene expression profiling reveals defined functions of the ATP-Binding cassette transporter COMATOSE late in phase II of germination. *Plant Physiol* 143: 1669-1679**.**

    My role was to design and conduct experiments for flavonoid localization and accumulation and contribute to writing the paper. I also developed new method for imaging flavonoids in embryos.

27. Jain A, Poling, MD, Karthikeyan AS, Blakeslee JJ, Peer WA, Titapiwatanakun B, Murphy AS, Raghothama KG. (2007) Differential effects of sucrose and auxin on localized Pi-deficiency induced modulation of different traits of root system architecture in Arabidopsis. *Plant Physiology* 144: 232-247.

    My role was to design and conduct experiments and analyze data for flavonoid localization and accumulation in response to nutrient conditions, specifically carbon and phosphorus availability, and contribute to writing the paper.

26. Bandyopadhyay A, Blakeslee JJ, Lee OR, Mravec J, Sauer M, Titapiwatanakun B, Makam SN, Bouchard R, Geisler M, Martinoia E, Friml J, Peer WA, Murphy AS (2007) Interactions of PIN and PGP auxin transport mechanisms. Intercellular Signalling in Plants. *Biochemical Society Transactions* 35: 137-141.

    I contributed to formatting and writing the paper and my interests were the roles of flavonoids and oxidative compounds in auxin transport.

25. Blakeslee JJ, Bandyopadhyay A, Lee OR, Sauer M, Mravec J, Titapiwatanakun B, Makam S, Bouchard R, Adamec J, Geisler M, Martinoia E, Friml J, Peer WA, Murphy AS (2006) Interactions between PGP, PIN, and AUX/LAX auxin transport proteins from Arabidopsis. *Plant Growth Regulation Society America Quarterly* 34 (3).

    I contributed to writing the paper and my interests were the roles of flavonoids and oxidative compounds in auxin transport.

24. Orlova I, Marshall-Colón A, Schnepp J, Wood B, Varbanova M, Fridman E, Blakeslee JJ, Peer WA, Murphy AS, Rhodes D, Pichersky E, Dudareva N. (2006) Reduced benzylbenzoate synthesis in

petunia increases flux from the non-oxidative pathway to benzenoid compounds in a light-dependent manner. *Plant Cell* 18: 3458-3475.

My role was to design and conduct experiments, analyze data for flavonoid localization and accumulation and contribute to writing the paper.

23. Peer WA, Mahmoudian M, Lahner B, Richards EL, Reeves RD, Murphy AS, Salt DE. (2006) Assessment of plants from the Brassicaceae family as genetic models for the study of nickel and zinc hyperaccumulation. *New Phytologist* 172: 248-260.

    My role was to design, conduct and supervise the experiments, analyze the data, write the paper, draw conclusions with companion paper. My interests were oxidative states of metal hyperaccumualting native species.

22. Li J, Yang H, Peer WA, Richter G, Blakeslee JJ, Bandyopadhyay A, Titapiwatanakun B, Undurraga S, Khodakovskaya M, Richards EL, Krizek B, Murphy AS, Gilroy S, Gaxiola R. (2005) Arabidopsis H^+-PPase AVP1 regulates auxin mediated organ development. *Science* 310: 121-125.

    I contributed to the experimental design, conducted experiments, analyzed data and wrote the corresponding parts of the paper. My interests were the relationship of flavonoids, cellular trafficking, and proton ATPases in the chemiosmotic theory of auxin transport.

21. Terasaka K, Blakeslee JJ, Titapiwatanakun B, Peer WA, Bandyopadhyay A, Makam SN, Lee OR, Richards EL, Murphy AS, Sato F, Yazaki K (2005) PGP4, an ATP-binding cassette P-glycoprotein, catalyzes auxin transport in *Arabidopsis thaliana* roots. *Plant Cell* 17: 2922-2939.

    I contributed to conceptualizing, writing and editing the article and experimental design, interpreting data, and directed the experiments for the revision. My interests were in spatial flavonoid localization in roots and shoots when shootward auxin transport was altered. This is a major research focus of my group.

20. Geisler M, Blakeslee JJ, Bouchard R, Lee OR, Vincenzetti V, Bandyopadhyay A, Titapiwantanakun B, Peer WA, Bailly A, Richards EL, Ejendal KFK, Smith AP, Baroux C, Grossniklaus U, Muller A, Hrycyna CA, Dudler R, Murphy AS, Martinoia E (2005) Cellular efflux of auxin catalyzed by the Arabidopsis MDR/PGP transporter AtPGP1. *The Plant Journal* 44: 179-194.

    I contributed to conceptualizing and writing the article and the experimental design, data analysis and interpretation and figure preparation, and directed the experiments for the revision. My interests were the role of flavonoid-sensitive auxin transporters in plant growth and development and the genetic components that interface between auxin responses and auxinic herbicides.

19. Blakeslee JJ, Peer WA, Murphy AS (2005) Auxin transport. *Current Opinion in Plant Biology* 8: 494-500.

    I contributed to the writing and the models of vesicular cycling. My interests were cellular trafficking of proteins that had flavonoids sensitive activities.

18. Murphy AS, Bandyopadhyay A, Holstein SE, Peer WA (2005) Endocytotic cycling of PM proteins. *Annual Review of Plant Biology* 56: 221-251.

    I contributed to the writing and the models of vesicular cycling. My interests were cellular trafficking of proteins that had flavonoids sensitive activities.

17. Baxter IR, Young JC, Armstrong G, Foster N, Peer WA, Murphy AS, Harper JF (2005) A plasma membrane H^+-ATPase is required for the formation of proanthocyanindins in the seed coat endothelium of *Arabidopsis thaliana*. *Proceedings of the National Academy of Sciences USA* 102: 2649-2654.

I contributed to the experimental design, conducted experiments, analyzed data and wrote the corresponding parts of the paper. My interests were the relationship of flavonoids, the plasma membrane and proton ATPases.

16. Makam SN, Peer WA, Blakeslee JJ, Murphy AS (2005) Cultural conditions contributing to vine decline syndrome in watermelon. *HortScience* 40: 597-601.

    I contributed to the data analyses and writing. My interests were the role of flavonoid-sensitive metal center proteins and auxinic herbicides and their roles in plant immunity.

15. Peer WA*, Bandyopadhyay A, Blakeslee JJ, Srinivas MN, Chen RJ, Masson PH, Murphy AS (2004) Variation in expression and protein localization of the PIN family of auxin efflux facilitator proteins in flavonoid mutants with altered auxin transport in *Arabidopsis thaliana*. *Plant Cell* 16: 1898-1911.

    I contributed to the experimental design, analyzing the data and writing the paper. My interests were the role of flavonoid-sensitive auxin transporters in plant growth and development. This work elucidated the function of flavonoids in the trafficking of transporters and how auxin can alter its own transport streams.

14. Freeman JL, Persans MW, Nieman K, Albrecht C, Peer WA, Pickering IJ, Salt DE. (2004) Increased glutathione synthesis plays a key role in nickel tolerance in *Thlaspi* nickel hyperaccumulators. *Plant Cell* 16: 2176-2191.

    I contributed to the experimental design, and conducted and supervised experiments. My interests were in metal-induced reactive oxygen species generation and spatio-temporal differences among metal accumulators and non-accumulators.

13. Blakeslee JJ, Bandyopadhyay A, Peer WA, Makam SN, Murphy AS (2004) Relocalization of the PIN1 auxin efflux facilitator plays a role in phototropic responses. *Plant Physiology* 134: 28-31.

    I contributed to the experimental design, analyzing the data and writing the paper. My interests were the role of flavonoid-sensitive auxin transporters in plant growth and development. My interest were also on phototropism as I had studied light-mediated responses as part of my dissertation.

12. Smith AP, Nourizadeh SD, Peer WA, Xu JH, Bandyopadhyay A, Murphy AS, Goldsbrough PB (2003) Arabidopsis AtGSTF2 is regulated by ethylene and auxin, and encodes a glutathione S-transferase that interacts with flavonoids. *Plant Journal* 36: 433-442.

    I contributed to the experimental design, conducted experiments, and analyzed data, and wrote the corresponding part of the paper. My interests were the role of the flavonoid-binding GSTF2 and redox status.

11. Peer WA*, Murphy AS (2003) Floral scent of *Arabidopsis lyrata* (Brassicaceae). *Biochemical Systematics and Ecology* 31: 1193-1195.

    I conducted experiments and analyzed data and wrote the paper. My interests were in the specialization/ loss-of-function of specialized among Arabidopsis species. This work identified the benenzoid pathway important for floral scent.

10. Muday GK, Peer WA, Murphy AS (2003) Vesicular cycling mechanisms that control auxin transport polarity. *Trends in Plant Science* 8: 301-304.

    I contributed to the model of vesicular cycling and graphically represented it. My interests were cellular trafficking of proteins that have flavonoids sensitive activities.

9. Peer WA*, Mahmoudian M, Lahner B, Reeves RD, Murphy AS, Salt DE (2003) Identifying model metal hyperaccumulating plants: germplasm analysis of 20 Brassicaceae accessions from a wide geographical area. *New Phytologist* 159: 421-430.

I coordinated the project, designed the experiments and matrix, directed and preformed experiments, analyzed the data and wrote the paper. My interests were oxidative states of metal hyperaccumualting native species.

8. Noh B, Bandyopadhyay A, Peer WA, Spalding EP, Murphy AS (2003) Enhanced gravi- and phototropism in plant *mdr* mutants mislocalizing the auxin efflux protein PIN1. *Nature* 423: 999-1002.

I contributed to the experimental design, analyzing the data and writing the paper. My interests were the role of flavonoid-sensitive auxin transporters in plant growth and development. My interest were also on phototropism as I had studied light-mediated responses as part of my dissertation.

7. Murphy AS, Hoogner KR, Peer WA, Taiz L (2002) Identification, purification, and molecular cloning of N-1-naphthylphthalmic acid-binding plasma membrane-associated aminopeptidases from Arabidopsis. *Plant Physiology* 128: 935-950.

I contributed to the interpreting the data and writing the paper. My interests were the role of flavonoid-sensitive aminopeptidases and auxinic herbicides in plant growth and development.

6. Brown DE, Rashotte AM, Murphy AS, Normanly J, Tague BW, Peer WA, Taiz L, Muday GK (2001) Flavonoids act as negative regulators of auxin transport in vivo in Arabidopsis. *Plant Physiology* 126: 524-535.

I contributed to the experimental design, interpreting the data and writing the paper. In this and the companion paper below, I reconciled the data and worked out the plans for two papers with the authors. My interests were the role of flavonoids and the spatio-temporal localization in plant growth and development.

5. Peer WA*, Brown DE, Tague BW, Muday GK, Taiz L, Murphy AS (2001) Flavonoid accumulation patterns of *transparent testa* mutants of Arabidopsis. *Plant Physiology* 126: 536-548.

I contributed to the experimental design, conducting experiments, interpreting the data and writing the paper. In this and the companion paper above, I reconciled the data and worked out the plans for two papers with the authors. My interests were the role of flavonoids and the spatio-temporal localization in plant growth and development.

4. Murphy A, Peer WA, Taiz L (2000) Regulation of auxin transport by aminopeptidases and endogenous flavonoids. *Planta* 211: 315-324.

I contributed to the experimental design, conducting experiments, interpreting the data and writing the paper. This paper is where my work on flavonoids was first published. I was working on flavonoids and metal accumulation in the California native Mimulus guttatus, but switched to Arabidopsis thaliana since genetics were available in this species. I developed a live cell imaging protocol for identifying flavonoids subcellular localization and speciation in planta using epifluorescence and confocal laser scanning microscopy. I also conducted enzyme assays on the flavonoid-sensitive metal-center proteins.

3. Peer WA*, Briggs WR, Langenheim JH (1999) Shade-avoidance responses in two common coastal redwood forest species, *Sequoia sempervirens* (Taxodiaceae) and *Satureja douglasii* (Lamiaceae), occurring in various light quality environments. *American Journal of Botany* 86: 640-645.

My interests were the natural variation of specialized compounds in response to environmental stimuli, specifically red light, at the ecosystem level. This is from my dissertation.

2. Peer WA, Langenheim JH (1998) Influence of phytochrome on leaf monoterpene variation in *Satureja douglasii*. *Biochemical Systematics and Ecology* 26: 25-34.

My interests were the natural variation of specialized compounds in response to environmental stimuli, specifically red light, at the organismal level. This is from my dissertation.

1. Peer W, Silverthorne J, Peters JL (1996) Developmental and light-regulated expression of individual members of the light-harvesting complex b gene family in *Pinus palustris*. *Plant Physiology* 111: 627-634.

My interests were the variation in gene family function, in this case proteins that bind specialized compounds, at the cellular level. This is from my dissertation.

II.C. Published Conference Proceedings (*referred*)

Peer WA, Murphy AS. (2011). Engaging under-represented populations in agricultural research: Are there factors other than gender and diversity? Advance Gender and STEM Research National Symposium. February 18. Purdue University, West Lafayette, IN.

Peer WA, Murphy AS. (2010). Summer research programs and academic-year continuity of summer research programs. Advance Gender and STEM Research Symposium. February 19. Purdue University, West Lafayette, IN.

II.D. Conferences, Workshops, and Talks
(54 talks delivered)

Oxidative inactivation of auxin by DAO1 regulates growth in *Arabidopsis thaliana*. 22nd International Conference on Plant Growth Substances. Toronto, Canada, June 21-25, 2016.

Abiotic stress regulates the auxin transporter ABCB4 via a saposin B aspartic protease. 17th International Plant Membrane Biology Workshop. Annapolis, MD, June 5-10, 2016.

Oxidative inactivation of auxin by DAO1 regulates growth in *Arabidopsis thaliana*. Mid-Atlantic Section – American Society of Plant Biology Swarthmore College, PA, April 9, 2016.

The role of iron in biofuel conversion and hormone redox homeostasis. Institute for Bioscience and Biotechnology Research, Shady Grove, MD. March 29, 2016

Stress hormone induction of saposin-domain aspartyl protease degradation of ABCB4. National Cancer Institute, Bethesda, MD. January 14, 2016

A tale of two enzymes: auxin transport and auxin responses. Biology Department, Catholic University of America, Washington, D.C., October 26, 2015

Efflux transporters in plants: auxin transport. 2015 Gordon Research Conference on Multi-Drug Efflux Systems. Barga, Italy, April 26 – May 1, 2015. Invited speaker.

Next generation biofuels and tailored biomass. University of Maryland Bioenergy Workshop, University of Maryland, March 25, 2015

A tale of two enzymes: auxin transport and auxin responses. Department of Horticulture and Crop Science, The Ohio State University, April 1, 2015

Thlsapi goesingense. Weed Risk Assessment 101. USDA-APHIS. Raleigh, North Carolina. February 24-27, 2015,

Transition metals: Metalloenzymes and cell wall hydrolysis. Department of Environmental Science and Technology, University of Maryland, College Park, MD. February 19, 2015.

Engaging under-represented populations in agricultural research. Innovations in Teaching and Learning Conference. University of Maryland, College Park, MD. April 25, 2014.

Weed Risk Assessment: Modeling invasiveness of non-native plant species. Animal and Plant Health Inspection Service, United States Department of Agriculture, Riverdale, MD. March 31, 2014.

Metalloenzymes and oxidative stress. Maryland Metal Group, University of Maryland, College Park, MD. August 8, 2013.

Arabidopsis aminopeptidase P1 (APP1) exhibits peptidyl-prolyl chaperone activity. Society for Experimental Biology. 3-6 July, 2013. Valencia, Spain.

Evidence of oxidative attenuation of auxin signalling. 14th Annual Plant Biology Minisymposium, University of Maryland, College Park, MD. May 23, 2013.

Regulation of auxin signalling by redox homeostasis. National Taiwan University, Taipei, Taiwan, ROC. March 22, 2013.

Aminopeptidase P1 and auxin signaling. National Taiwan University, Taipei, Taiwan, ROC. March 22, 2013.

Regulation of auxin signalling by redox homeostasis. Chinese Academy of Sciences, Shanghai, PRC. March 19, 2013.

Auxin 2012 Report on Conference. Department of Cell Biology and Molecular Genetics, University of Maryland, College Park, MD. February 2, 2013.

Flavonoids, auxin and redox homeostasis. Auxin 2012. Waikoloa, HI, USA. 9-14 December 2012.

From Bay to Bay to Bay: Transition metals and reactive oxygen species. Department of Environmental Science and Technology, University of Maryland, College Park, MD. March 28, 2012.

Undergraduate and graduate student engagement in learning and discovery. Department of Nutrition and Food Science, University of Maryland, College Park, MD. February 22, 2012.

Traditional and non-traditional roles of flavonoids. Department of Nutrition and Food Science, University of Maryland, College Park, MD. February 22, 2012.

A story of two aminopeptidases: M1 and M24 metalloproteases in growth and development. Department of Plant Science, University of Maryland, College Park, MD. January 11, 2012.

Arabidopsis APP1 mediates nutritional homeostasis and hormonal cross-talk as a rate-limiting component of auxin signalling. American Society of Plant Biologists Annual Meeting. Minneapolis, MN. August 6-10, 2011.

Arabidopsis APP1 mediates nutritional homeostasis and hormonal cross-talk as a rate-limiting component of auxin signalling. Society for Experimental Biology. 1-4 July, 2011. Glasgow, Scotland, UK. (invited, declined invitation)

The role of aminopeptidase M1 in root development. The 1st International conference on PLANT PROTEASES 2011. April 10-14, 2011. Hemavan, Sweden.

Engaging under-represented populations in agricultural research: Are there factors other than gender and diversity? Advance Gender and STEM National Research Symposium. February 18, 2011. Purdue University, West Lafayette, IN. Symposium speaker and committee member.

Challenges and solutions for plant cellular imaging. Imaging in the Life Sciences Research Symposium. Bindley Bioscience Center, West Lafayette, IN. September 8, 2010.

APM1 regulates cell cycle progression and auxin transport components. Society for Experimental Biology. 30 June - 3 July, 2010. Prague, Czech Republic.

Summer research programs and academic-year continuity of summer research programs as components of doctoral & post-doctoral mentoring. Association of Public and Land Grant Universities ICA April 7-9, 2010, Ghent, Belgium (invited, declined invitation)

Summer research programs and academic-year continuity of summer research programs. Advance Gender and STEM Research Symposium. February 19, 2010. Purdue University, West Lafayette, IN. Symposium speaker and committee member.

The role of APM1 in seedling establishment. Interdisciplinary Plant Group, University of Missouri, Columbia, MO. February 15, 2010.

The catalytic and protein-protein interaction domains are independently required for APM1 function. 3rd Pan American Plant Membrane Biology Workshop. 13-16 January 2010, Puebla, Mexico.

Mutation of the membrane-associated M1 protease APM1 results in distinct embryonic and seedling developmental defects. Dept. of Biology, IUPUI, Indianapolis, IN. October 9, 2009.

Dimerization and membrane localization are required for activity of the M1 aminopeptidase APM1. Protein Complexes in Plant Signalling and Development (Phoenix 2009), 25-27 June 2009, Glasgow, Scotland, UK.

It's not what you see that always matters: colorless flavonoids and the cell cycle. Dept. of Horticulture. Purdue University, West Lafayette, IN. June 4, 2009.

BioImaging. Horticulture and Landscape Architecture Departmental Research Retreat. Purdue University, West Lafayette, IN. May 15, 2009.

Spectral scanning and co-localization of membrane proteins and small molecules. PUBAMS, Purdue University, West Lafayette, IN. May 8, 2009.

Mutation of the membrane-associated M1 protease APM1 results in embryonic and seedling developmental defects phenocopied by treatment with 1-N-napthylphthalamic acid. Society for Experimental Biology annual meeting, Marseille, France, 6-10 July 2008.

Localization and function of the β-adaptin isofroms in Arabidopsis. Society for Experimental Biology annual meeting, Marseille, France, 6-10 July 2008.

Summer internship program at Purdue University. Recruitment seminar. California State University, Monterey Bay, Marina, CA. April 14, 2008.

APM1 is necessary for embryonic and post-embryonic root meristem development. University of Zurich, Switzerland, Sept 3, 2007

Session chair. Plant Hormones. American Society of Plant Biologists Annual Meeting. Chicago, IL. July 7-11, 2007.

Visualizing small molecules with fluorescent dyes. Horticulture and Landscape Architecture Departmental Research Retreat. Purdue University, West Lafayette, IN. May 10, 2007.

Phytoremediation – model systems. Dept. of Biology, Colorado State University, Fort Collins, CO. April 4, 2006.

Targets of flavonoid regulation. Colloquium in Life Sciences. Dept. of Biology, Colorado State University, Fort Collins, CO. April 3, 2006.

Flavonoid targets and models. Dept. of Horticulture and Landscape Architecture. Purdue University, West Lafayette, IN. February 16, 2006.

Recruitment of under-represented students to a career in the life sciences. Howard Hughes Medical Institute Symposium on Diversity in the Sciences, Monroe, LA, April 7-8, 2006. Symposium Speaker

From MSI to Graduate School in Life Sciences: A Model Program. Minority Serving Institution Research Partnerships National Conference, Edinburg, TX, February 1-4. 2006. Symposium Speaker

Targets of flavonoid regulation. Howard Hughes Medical Institute Lecture, University of Texas – Pan-American, TX. Nov 7, 2005.

PIN gene expression and protein localization are altered in flavonoid-deficient mutants. Horticulture and Landscape Architecture Departmental Research Retreat. Purdue University, West Lafayette, IN. May 10, 2004.

PIN1 & PIN4, but not PIN2, auxin efflux carriers are mislocalized in flavonoid-deficient mutants. American Society of Plant Biologists Annual Meeting, Honolulu, HI. July 25-30, 2003.

Influence of phytochrome on leaf monoterpene variation in *Satureja douglasii*. American Institute of Biological Sciences Annual Meeting, Seattle, WA. Aug 4-6, 1996.

Dark chlorophyll synthesis, the plastidic signal, and *cab* genes in *Pinus palustris*. Bay Area Photomorphogenesis Meeting, Santa Cruz, CA. Dec 8, 1991.

II.E. Completed Creative Works

II.E.I. Photography
Journal cover

The Plant Cell 2009 Volume 21

II.E.2. Websites
http://www.agriculture.purdue.edu/clsm/index.shtml

http://www.hort.purdue.edu/hort/research/murphy/index.htm

http://www.wendyannpeer.com/

II.E.3. Artwork
Book covers
The Plant Plasma Membrane. (2010) Murphy AS, Peer WA, and Schluz B, eds. Springer-Verlag, Berlin.

The Science of Flavonoids (2006) E Grotewold, ed. Springer-Verlag, Berlin, 1st edition.

II.F. Sponsored Research

USDA-APHIS co-operative agreement to University of Maryland
Weed Risk Assessment: Modeling invasiveness potential of non-native plant species and trait identification. Wendy Peer, PI. September 21, 2016-Septemeber 30, 2017. $134,040

Maryland Soybean Board to University of Maryland
Soybean stover for direct catalytic conversion biofuels & enhanced seed yield and mineral availability. Wendy Peer, PI. 04/01/2016 - 03/31/2017, $20,500.

USDA-APHIS co-operative agreement to University of Maryland
Weed Risk Assessment: Modelling Invasiveness Potential of Non-Native Plant Species. Wendy Peer, PI. September 30, 2014-Septemeber 29, 2015. $97,101

University of Maryland Ventures
Polyphenolics as non-toxic, natural products as adjuvants to enhance herbicide efficacy. Wendy Peer, PI, Angus Murphy, co-PI. June 8, 2015 – December 20, 2015, $14, 180

National Science Foundation to University of Maryland
Conference Proposal: 17th International Workshop on Plant Membrane Biology 2016. Angus Murphy, PI, Wendy Peer, co-PI. 1/1/2015 – 12/31/2016, $15, 000.

Maryland Agricultural Experiment Station to University of Maryland

Evolution of herbicide resistance in *Amaranthus*. Wendy Peer, PI. July 1, 2013 – November 30, 2014. $30,000.

National Science Foundation - ADVANCE Seed Grant to University of Maryland
When tomatoes talk back: Salmonella-tomato plant interactions and pathogen growth responses to plant defense activation. Shirley Micallef, PI; Wendy Peer, co-I. April1, 2014. $20,000.

Department of Energy to Purdue University, transferred part to University of Maryland
"Center for the Direct Catalytic Conversion of Biomass to Biofuel." Maureen McCann, PI. Wendy Peer, co-PI, et al. 09/01/2009-07/31/2014. $15,074,136. Agency funding reported. University cost-share not reflected.

USDA, NIFA Nanotechnology to Purdue University, transferred part to University of Maryland
"Functionalized lipid nanoparticles for pathogen inactivation in cut leafy-greens and other minimally processed vegetables." Fernanda San Martin-Gonzalez PI, Wendy Peer co-PI, Bruce Applegate co-PI, Jeffrey Youngblood co-PI. 11/1/10-10/31/2013. $404, 315.

Agricultural Research Program Assistantship, Purdue University
Identification of endogenous substrates of APM1. Wendy Ann Peer, PI. $17,500 for graduate student stipend. Renewable.

II.G. Patents

III. Teaching, Mentoring and Advising.

III.A. Courses Taught

University of Maryland

Courses
ENST 689O – Fall 2015 1 credit, 100% credit
ENST 689Y – Fall 2015, Spring 2016, Fall 2016, 2 credits, 50% credit
ENST 472 Spring 2016, 3 credits, 100% credit
ENST 471 – Fall 2012, 2013, 2014, 2 credits, 100% credit
ENST 499 – research internship Fall 2015, 3 credits, 100% credit
ENST 407/ PLSC 400 BISCI 442, University of Maryland, Spring 2013, Spring 2014, Fall 2014, 4 credits, lecture and lab, 33.3% credit for course. Spring 2016, 50% credit for course
PLSC 789M – Spring 2013, Fall 2013, Spring 2014, Fall 2014, Spring 2015, 1 credit, 50% credit

Tutorials
Zeiss Confocal Laser Scanning Microscopy Tutorial (LSM 700 and LSM 710)
Zeiss Epifluorescence Microcopy Tutorial
Leica Epifluorescence Microcopy Tutorial
Andor Spinning Disk Tutorial

Purdue University

Courses (2009-2012)
HORT 551 Cellular and Molecular Plant Physiology, 3 cr, Fall, 50% lecture
HORT 590 Plant Development and Transport, 2 cr, Fall/Spring/Summer, 50% lecture

HORT 590 Basic Light Microscopy for Plant Biology, 2 cr, Spring, 100% lecture,100% lab
HORT 590 CLSM for Plant Biology and Agriculture, 2 cr, Spring, 100% lecture, 100% lab
HORT 590 CLSM for Plant Biology and Agriculture, 3 cr, Fall, 100% lecture, 100% lab
BIOL 595 Cell Biology of Plants – guest lecturer on Endocytosis

Courses (2007-2008)
HORT 590 Plant Transport Regulation
HORT 490 Independent Research
HORT 551 Biophysical Plant Physiology. Guest lecturer.
BTNY 697 Seminars in Plant Science. Guest lecturer.
HORT 301 Plant Physiology. Student advisor for research projects.
HORT 601 Planning and Presenting Horticulture Research Seminar. Guest lecturer.
Graduate Symposium, Entomology Dept. (2002)

Tutorials (2007-2012)
Zeiss Confocal Laser Scanning Microscopy Tutorial
Zeiss AxioImager Microscopy Tutorial
Nikon Eclipse E800 Epifluorescence Microscopy Tutorial
Intavis InSitu ProVS - Immunolocalization and *in situ* hybridization Tutorial

III.B. Teaching Innovations
III.B. Course or Curriculum Development

University of Maryland 2012-2016

ENST 689O Invasive Plants.
I have designed this new course to that integrates traditional ecological perspective on invasion with molecular biology to understand the biological mechanism of invasion and modeling to predict invasion into new niches with the impact of climate change.

ENST 471 Capstone I
The course has been updated this course this course to include a panel discussion "Real Jobs, Real People" featuring ENST graduates. The course includes clear guidelines regarding the integration and application of the students' knowledge in science-based capstone projects, and has added a learning outcome of professional poster presentation.

ENST 407 / PLSC 400 / BISCI 442 Plant Physiology/Environmental Plant Physiology
I have redesigned the course content with my co-instructors Dr. Jianhua Zhu and Dr. Angus Murphy; Dr. Murphy mentored Dr. Zhu with the teaching this semester in Spring 2013. In Fall 2013, it was co-taught with Dr. Haven Sze and Dr Zhu to consolidate the plant physiology courses on campus and begin the process of a unified Plant Biology Program curricula. In Spring 2014, I co-taught with Dr. Jose Feijo and Dr, Zhu. I have also redesigned the lab content with my co-instructors. In Spring 2016, I co-taught this course with Dr. Jose Feijo. The course is based on the modifications I made to HORT 551 taught at Purdue University and this redesigned course integrates concepts from the environment and ecosystem into plant physiology and introduced discovery-based learning into the laboratory classes. My redesign of the Plant Physiology class (starting at Purdue) contributed to the updated Unit III Growth and Development in *Plant Physiology and Development*, 6th ed. 2015. Taiz L, Zeiger E, Mouller IM, Murphy AS, eds. Sinaur Assoc., Inc., Sunderland, MA,

Purdue University 2009-2012

HORT 551 Cellular & Molecular Plant Physiology, Purdue University 2009-2012
I have redesigned the HORT 551 Cellular & Molecular Plant Physiology course content with my co-instructor Dr. Angus Murphy. We began the development of new course material in Fall 2009

and have completed it in Fall 2011. The greatest changes in the course are that it is now taught by two instructors instead of three and the format is 2 lectures and 1 discussion of the current literature related to the lectures per week.

HORT 590 CLSM for Plant Biology and Agriculture

HORT 590 Basic Light Microscopy for Plant Biology

I have designed and taught two new lecture and lab courses both taught in Spring 2011: HORT 590 Basic Light Microscopy for Plant Biology, HORT 590 CLSM for Plant Biology and Agriculture. Based on student feedback, I re-designed HORT 590 CLSM for Plant Biology and Agriculture lecture and lab as a full semester course taught in Fall 2011.

I developed laboratory manuals for HORT 590 CLSM for Plant Biology and Agriculture and HORT 590 Basic Light Microscopy for Plant Biology.

I developed a laboratory kit based on HORT 590 Basic Light Microscopy for Plant Biology course to be used in a high school biology class.

III.C. Advising: Research or Clinical

III.C.1. Undergraduate

Summer research

2016: two students (both minority, Uma Krishnan, Poolesville High School, Mayah Lovell, University of Maryland. all women)

2015: four students University of Maryland. Chinchu Harris, Jongmi Park, Ciaran Guha-Gilford, Fan Wu (all women)

2013: two minority students, University of Texas Pan American. Robert Mousselli, Esteban Triplett

2012: one minority students, California State University, Monterey Bay, one minority student St. Mary's Notre Dame, one student Purdue University; Elizabeth Villafuerte, Abel Duarte, James Nolan

2011: two students California State University, Monterey Bay, one minority student University of Texas Pan American, Purdue University. Flor Sandoval, Emily Roncase, Candace Pritchard, Kristen Downey

2010: two minority students California State University, Monterey Bay, University of Texas Pan American, Purdue University. Abass Conteh, Sarah Griffith, Alondra Hernandez, Jia Li, Candace Pritchard, Dahlia Shvets

2009: two minority students California State University, Monterey Bay. Erika Valle, Dawn Dalaire

2008: one minority student, Harvard; one minority student, California State University Monterey Bay; two students, Purdue University. Lauren Evans, Mark Jenness, Michael Rauscher, Resha Patel

2007: one minority student, University of Texas Pan American; three students, Purdue University. Nabing Li, Resha Patel, Krystal Anderson, Eric O'Brien

2006: eight minority students, University of Texas Pan American, Misericordia College, Malcolm X College. Jade Li, Shenaley Llegas, Violet Yeager, Hille Corona, Steve French, Andrew Marky,

2005: eight minority students, University of Texas Pan American. Julie Zuniga, Charlotte Lloren, Andrew Marky, John Adame, Erick Hurtado, Travis Brandt, Jade Li

2004: six minority students, University of Texas Pan American. Jacqueline Bruce, Tatiana Cordova, Michael Reyes, Susan Edionwe, Sharifa Limit, Charisse Lloren

2003: one minority student, University of Texas Pan American. Steve Reyes

Academic year

2016-2017 Mayah Lovell (UMD)

2015-2016 Sarah Turner, Fan Wu (UMD)
2014-2015 Sarah Turner, Fan Wu Chinchu Harris, Jongmi Park, Ciaran Guha-Gilford, Matthew Reilly, Sarah Turner, Sam Virta, Fan Wu, (UMD)
2013-2014 Chinchu Harris, Lora Margolina, Anthony Patrick (UMD)
2010-2011 Kristen Downey, David Quinn (Ivy Tech)
2009-2010 Abass Conteh (Purdue)
2008-2009 Resha Patel, Abass Conteh, Angie Moon (Purdue)
2007-2008 Resha Patel, Krystal Anderson (Purdue)
2006-2007 Mindy Michael, Bennis Pantojah (Purdue)
2005-2006 Mindy Michael (Purdue)
2004-2005 Stacy Herre (Purdue)
2003-2004 Kelly Adams, Stacy Herre, Mansi Kapoor (Purdue)
2002-2003 Heather Arensaman, Stacy Herre, Jewel Wise, Wei (Purdue)
2001-2002 Heather Arensaman, Kate Carter, Stacy Herre, Kristen McFarren (Purdue)

III.C.2. Master's

University of Maryland

Virginia Velez, expected gradation May 2019, major professor
Harris, Chinchu, graduation expected May 2017, major professor
Wattarantenne, Kasuni, graduation expected May 2017, major professor
Phannareth, Tommy, 2015, committee member
Schmidt, Dietrich, 2016, committee member
Egekwu, Chioma, 2016, committee member

Purdue University

Ma, Guojie, 2016, co-major professor
Reemmer, Jesica, 2014, co-major professor
Liu, Xiping, 2013, major professor

III.C.3. Doctoral

University of Maryland

Trouth, Frances, expected graduation May 2018, major professor
Zhang, Jun, 2016, major professor
Segobye, Kabelo, expected graduation May 2018, co-major professor
Dossick, David, committee member
Pritchard, Candace, committee member
Jenness, Mark, committee member
Li, Gen, committee member
Ferelli, Angela, committee member
Matua, Martina Gonzalez, committee member
Wong, Tiffany, committee member

Universidade Estadual de São Paulo, Brasil (PhD research conducted at University of Maryland)

Mastrotti, Fernanda, 2016, co-major professor

Purdue University

Hosein, Fazeeda, 2010, co-major professor
Rodriguez-Martinez, Veronica, 2014, committee member
Christian, Hans, 2013, committee member
Zhang, Wen, 2010, committee member
Kim, Jeong-Im, 2007, committee member
Knoeller, Anne, 2007, committee member
Bandyopadhyay Banergee, Anindita, 2006, committee member

III.C.4. Post-doctoral

Dr. Haibing Yang (2010-2014)
Dr. Nicola Carraro (2010-2013)
Dr. Gregory Richter (2009-2010)

III. D. Other

University of Maryland

Faculty advisor, Friends of the Co-op, 2016

Advisor for five Deapartment of Environmental Science and Technology undergraduate students in Fall 2015.

University of Maryland and Purdue University

In collaboration with Dr. Angus Murphy, I have developed an integrated academic year/summer term research experience curriculum for undergraduate students in collaboration with faculty at minority serving institutions. The objective is to increase the participation of underrepresented populations in life science careers and invigorate the research of the faculty at the minority serving institutions. The success of the program is indicated by the high percentage of graduate school acceptances for the students who have participated. The program has received national recognition by the Howard Hughes Medical Foundation and Minority Serving Institutions Conference in 2005-2006. The integrated academic year/summer internship program has been incorporated into all of my current grant funding.

IV. Service and Outreach

<u>IV.A. Editorships, Editorial Boards, and Reviewing Activities</u>

IV.A.1. Editorships

Specialty Chief Editor of *Frontiers in Plant Traffic and Transport* 2012-present
Associate Editor Frontiers in *Plant Traffic and Transport* 2010-2012
Academic Editor *PLoS ONE* 2009-present

IV.A.2. Editorial Boards

Board of Advisors, *New Phytologist* 2013-2016

IV.A.3. Reviewing Activities for Journals and Presses

Nature, Nature Chemical Biology, Plant Cell, Plant Physiology, Trends in Plant Science, Molecular Plant, New Phytologist, Functional Plant Biology, Frontiers in Plant Physiology, Cellular and Molecular Life Sciences, Annals of Botany, Experimental and Environmental Botany, Bioremediation Journal, Journal of Hazardous Materials, Plant Science

IV.A.4. Reviewing Activities for Agencies and Foundations

Reviewer, NSF 2016
Reviewer, USDA-NIFA 2015
Reviewer, Czech Science Foundation, (2010 - 2014)
Reviewer, National Science Foundation, 2013 – declined invitation (submitted to same program) Panel Member
Reviewer, Austrian Science Fund, 2013
Reviewer, National Science Foundation, 2012 – declined invitation (submitted to same program) Panel Member
Reviewer, National Science Foundation, 2011 – one panel, and one other invitation (declined invitation) Panel Member

Reviewer, Department of Energy, 2011, Panel Member
Reviewer, Swiss National Science Foundation, 2011
Reviewer, National Science Foundation, 2009 – one invitation (declined invitation) Panel Member
Reviewer, Netherlands Organization for Scientific Research, 2009
Reviewer, Binational Agriculture Research Development Fund, (US-Israel) (2007, 2008)
Reviewer, Science and Technology Foundation, (Portugal) (2008)
Reviewer, National Science Foundation, 2007 – two panels, Panel Member

IV.A.5. Reviewing Activities for Conferences
Society for Experimental Biology 2017
International Workshop for Plant Membrane Biology 2016
Society for Experimental Biology 2013
ADVANCE Gender and STEM National Research Symposium (2010, 2011)

IV.B. Committees, Professional & Campus Service

IV.B.1. Campus Service – Department
Internal review committee, sub-chair for coordination and operations, 2014-2016
Research committee 2014-2016
Diversity committee 2013-2016
Bioinformatics committee 2013
Chair of search committee - 2013
Governance committee 2012-2016

IV.B.2. Campus Service – College
Open House, University of Maryland, College Park, March 28, 2014.
Maryland Day, University of Maryland, College Park, April 27, 2013.
China and Taiwan, meetings with faculty and deans for collaborative research, March 17-25, 2013.
2nd Annual BARC-UMD Fall Symposium, Patuxent Research Reserve, Laurel, MD, October 18, 2012.
AGNR Open House, Clarkesville, MD, October 6, 2012.
AGNR 2 + 2 program, University of Maryland, College Park, September 14, 2012.

IV.B.3. Campus Service – University
Senator 2016 - present
Biological Sciences Day 2016, October 25, 2016, Judge
Senate Standing Committee on Equity, Diversity, & Inclusion (EDI) 2014-2016
Biological Sciences Day 2015, November 19, 2015, Judge
17th Annual Plant Biology Mini-symposium committee, University of Maryland, College Park, May 26, 2015
Maryland Center for Undergraduate Research – reviewer 2014
16th Annual Plant Biology Mini-symposium committee, University of Maryland, College Park, May 29, 2014
15th Annual Plant Biology Mini-symposium co-organizer, University of Maryland, College Park, May 29, 2013

IV.B.4. Offices and Committee Memberships
American Society of Plant Biologists, Mid-Atlantic Section, Secretary 2014-2016
American Society of Plant Biologists, Women in Plant Biology Committee 2010-2013

IV.B.5. Leadership Roles in Meetings and Conferences
Society for Experimental Biology Annual Meeting, Gothenburg, Sweden from 3 – 6 July 2017, Session organizer - plant membrane-protein dynamics/interactions during environmental change

Mid-Atlantic American Society of Plant Biology Spring Meeting, co-organizer, April 9, 2016. Swarthmore College, Pennsylvania.

Mid-Atlantic American Society of Plant Biology Winter Meeting, organizer, March 4, 2016. University of Maryland, College Park.

Mid-Atlantic American Society of Plant Biology Spring Meeting, co-organizer, April 18, 2015. Swarthmore College, Pennsylvania.

Mid-Atlantic American Society of Plant Biology Winter Meeting, organizer, March 6, 2015. University of Maryland, College Park.

16th Annual Plant Biology Mini-symposium, organizing committee, University of Maryland, College Park, May 28, 2015

15th Annual Plant Biology Mini-symposium co-organizer, University of Maryland, College Park, May 29, 2014

Society for Experimental Biology Annual Meeting, 3-6 July, 2013. Valencia, Spain, Session organizer – Protein Versatility

IV.B.6. Other Non-University Committees, Memberships, Panels, etc.

American Society of Plant Biologists, Mid-Atlantic Section, Secretary 2014-2016
American Society of Plant Biologists, Women in Plant Biology Committee 2010-2013

IV.B.7. Other

i. State of Maryland

Twilight Meeting, Western MD Research & Education Center (WMREC), Keedysville, MD, August 24, 2016
Twilight Meeting, Western MD Research & Education Center (WMREC), Keedysville, MD, August 19, 2015
Turf Field Day, Turf Grass Facility, University of Maryland, July 15, 2015
Twilight Meeting, Western MD Research & Education Center (WMREC), Keedysville, MD, August 20, 2014
16th Annual Maryland Commodity Classic, Centreville, MD, July 24, 2014
Maryland Beer Summit. Maryland Brewers Association, Annapolis, MD. February 26, 2014.
Joint meeting: Maryland Turfgrass Council, Maryland Turfgrass Association, Mid-Atlantic Chapter Golf Course Superintendent's Assoc. Meeting, Grasonville, MD May 21, 2013.
Maryland Turfgrass Council Day, University of Maryland, College Park, August 2012

ii. Purdue University - Campus service - Department of Horticulture and Landscape Architecture

Undergraduate internship committee, Chair
Seminar committee, member
Plant Biology darkroom, responsible faculty
Committee to prepare document for departmental review by NIFA, 2011

iii. Purdue University- College service - College of Agriculture

Plant Biology Institute Graduate Guidance Committee, committee member
Diversity Action Team in Agriculture, committee member
Life Science Microscopy Facility Director, search committee member

iv. Purdue University - University service

Purdue Life Sciences Fluorescence Microscopy Facility (LSFIF), co-director
LSFIF is also a Purdue Core Facility

v. State of Indiana

Life Science Fluoresce Imaging Facility (LSFIF) is an Indiana Clinical and Translational Sciences Institute (CTSI) facility

V. Awards, Honors and Recognition

V.1. Research Fellowships, Prizes and Awards

Thomson Reuters Highly Cited Researcher 2015

Excellence in Research Award, 2014-2015, Department of Environmental Science and Technology, University of Maryland

2014 TEAM Award, Purdue University

Excellence in Research Award 2012, Purdue University

American Society of Plant Biologists Top Authors Award 2004-2008

Women in Plant Biology travel grant 2011, $1000

Purdue Research Foundation travel grant, 2007, 2009, 2011, $1000 each year

Society for Experimental Biology travel grant 2010, £300