

## **ELISON B. BLANCAFLOR**

Plant Biology Division  
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### **EDUCATION**

**Postdoctoral fellow** (Plant Cell Biology), Pennsylvania State University, 1996-1999

**Ph.D.** (Biology) University of Louisiana, Lafayette, 1996

**M.S.** (Biology) University of Louisiana, Lafayette, 1993

**B.S.** (Horticulture) University of the Philippines, Los Banos 1985

### **PROFESSIONAL EXPERIENCE**

2006- Present, **Associate Professor**, Plant Biology Division, The Samuel Roberts Noble Foundation, Ardmore, OK

2002-2006, **Assistant Professor**, Plant Biology Division, The Samuel Roberts Noble Foundation, Ardmore, OK

2004- present, **Adjunct Faculty**, Center for Plant Lipid Research, Department of Biological Sciences, University of North Texas, Denton, TX

1999-2002, **Senior Research Associate II**, Plant Biology Division, The Samuel Roberts Noble Foundation, Ardmore, OK

1996-1999, **Postdoctoral scholar**, Biology Department, The Pennsylvania State University, University Park, PA

1991-1996, **Teaching Assistant**, Biology Department, University of Louisiana, Lafayette, LA

1988-1991, **Agricultural Supervisor**, Del Monte Phil. Inc. Mindanao, Philippines. A subsidiary of Del Monte Foods USA

1986-1988, **Research Assistant**, Institute of Plant Breeding, University of the Philippines, Los Banos, Philippines

### **HONORS/AWARDS**

Elected to the Honor Society of Phi Kappa Phi, 1993

Honorable mention for a student paper, American Society for Gravitational and Space Biology (ASGSB) meeting, San Francisco, CA, 1994

Elected to Sigma Xi, The Scientific Research Society, 1996

University Microfilms International Distinguished Dissertation Award for the Life Sciences Nominee, 1997

2000 Microscopy Society of America Traveling Poster Exhibit Award for the Biological Sciences

2005 Thora W. Halstead Young Investigator's Award, American Society for Gravitational and Space Biology

## **EXTERNAL COMPETITIVE RESEARCH GRANTS AWARDED**

### **Completed awards**

Project title: Enhanced labeling techniques to study the cytoskeleton during root growth and gravitropism (Blancaflor, Principal investigator)  
Source: National Aeronautics and Space Administration (NASA)-Fundamental Space Biology (NAG 2-1518), Term: 2001-2005  
Total award amount: \$255,908

Project title: A single photon confocal laser scanning microscope for multi-spectral imaging of plant cellular processes (Blancaflor, Principal investigator, Dixon, Nelson, Roossinck, May Co-PIs)  
Source: National Science Foundation (NSF) Multi-user Instrumentation (DBI-0400580)  
Term: 2004-2007  
Total award amount: \$339,647

Project title: Amidase-mediated modulation of *N*-acylethanolamine (NAE) signaling in plants  
Source: Department of Energy (DOE) Biosciences DE-FG02-05ER15647 (Co-PI with Kent Chapman, University of North Texas)  
Term: 2005-2008  
Total award amount: \$360,000 (Blancaflor lab \$86,480)

Project title: Supplemental Research Opportunity Award for Dr. Magaly Rincon-Zachary, Midwestern State University to support 3 month sabbatical at the Noble Foundation  
Source: National Science Foundation (NSF) Research Opportunities Award (ROA) supplement  
Term: Summer 2006  
Total award amount: \$22,000

### **Current awards**

Project title: DOE Bioenergy Research Centers (\$125 million proposal with Oak Ridge National Lab as the lead organization)  
Source of support: US Department of Energy Bioenergy Research Centers

Investigators: Richard A. Dixon, Fang Chen, Richard S. Nelson, Zeng-yu Wang, Michael Udvardi, Yuhong Tang, Elison Blancaflor, Kelly Craven, Malay Saha

Term: 2008-2013

Total award amount: NF (\$8,265,872) Blancaflor lab (\$444,962)

Project title: MRI: acquisition of a spinning disk confocal microscope for rapid imaging of plant cellular processes (Blancaflor, Principal investigator, Chen, Mysore, Nelson, Valster Co-PIs)

Source: National Science Foundation (NSF) Major Research Instrumentation (MRI) program (DBI-0722635)

Term: 2007-2010

Total award amount: \$378,685

Project title: Amidase-mediated modulation of *N*-acylethanolamine (NAE) signaling in plants (Co-PI with Kent Chapman, University of North Texas)

Source: Department of Energy (DOE) Biosciences (renewal for DE-FG02-05ER15647)

Term: 2008-2011

Total award amount: \$ 495,000 (Blancaflor lab - \$197,000)

Project title: Regulation of tip growth direction in plants (Blancaflor, Principal Investigator)

Source: Oklahoma Center for the Advancement of Science and Technology (OCAST)

Term: 2008-2010

Total award amount: \$85,180

Project title: Cross-talk between actin and auxin in root growth (Blancaflor, Principal Investigator)

Source: Oklahoma Center for the Advancement of Science and Technology (OCAST)

Term: 2010-2012

Total award amount: \$89,808

Project title: Actin regulation of *Arabidopsis* root growth and orientation during space flight (Blancaflor, Principal Investigator; Tang; Nakashima, Co-PIs)

Source: National Aeronautics and Space Administration (NASA)-Biological Research In Canisters (BRIC) for STS-131 Mission

Term: 2010-2012

Total award amount: \$142,069

## PUBLICATIONS

### Primary Research Articles

Rincon-Zachary M, Teaster TD, Sparks JA, Valster AH, Motes CM, **Blancaflor EB** (2010) Fluorescence resonance energy transfer sensitized emission of yellowameleon 3.60 reveals root-zone-specific calcium signatures in *Arabidopsis* in response to aluminum and other trivalent cations. *Plant Physiology* 10.1104/pp.109.147256

Srivastava AC, Palanichelvam K, Ma J, Steele J, **Blancaflor EB**, Tang Y (2010). Collection and analysis of expressed sequence tags derived from laser capture microdissected

switchgrass (*Panicum virgatum* L. Alamo) vascular tissues. *BioEnergy Research* 10.1007/s12155-010-9080-8

Kim S-c, Kang L, Nagaraj S, **Blancaflor EB**, Mysore KS, Chapman KD (2009) Fatty acid – mediated hypersensitivity to abscisic acid and hypersusceptibility to nonhost pathogens in *Arabidopsis* is independent of its catalytic activity. *Journal of Biological Chemistry* 284: 34065-34074

Gomez SK, Javot H, Deewatthanawong P, Torrez-Jerez I, Tang Y, **Blancaflor EB**, Udvardi MK, Harrison MJ (2009) *Medicago truncatula* and *Glomus intraradices* gene expression at the arbuscule-cortical cell interface in arbuscular mycorrhizal symbiosis. *BMC Plant Biology* 9:10

Yoo C-M, Wen J, Motes CM, Sparks JA, **Blancaflor EB** (2008) A class I ADP ribosylation factor-GTPase activating protein is critical for maintaining directional root hair growth in *Arabidopsis*. *Plant Physiology* 147: 1659-1674

Wang Y-S, Yoo C-M, **Blancaflor EB** (2008) Improved imaging of actin filaments in transgenic *Arabidopsis* plants expressing a green fluorescent protein fusion to the C and N termini of the fimbrin actin binding domain 2. *New Phytologist* 177: 525-536

Kang L, Wang Y-S, Uppalapati SR, Wang K, Tang Y, Vadapalli V, Venables BJ, Chapman KD, **Blancaflor EB**, Mysore KS (2008) Overexpression of a fatty acid amide hydrolase compromises innate immunity in *Arabidopsis*. *Plant Journal* 56: 336-349

Bernal AJ, Yoo C-M, Mutwil M, Jensen JK, Hou G, Blaukopf C, Sorensen I, **Blancaflor EB**, Scheller HV, Willats WGT (2008) Functional analysis of the cellulose synthase like genes *CSLD1*, *CSLD2* and *CSLD4* in tip growing *Arabidopsis* cells. *Plant Physiology* 148: 1238-1253

Zhao J, Cheng N-H, Motes CM, **Blancaflor EB**, Moore M, Gonzales N, Padmanaban S, Sze H, Ward JM, Hirschi KD (2008) AtCHX13 is a plasma membrane potassium transporter. *Plant Physiology* 148: 796-807

Guo B, Jin Y, Wussler C, **Blancaflor EB**, Motes CM, Versaw WK (2008) Functional analysis of the *Arabidopsis* PHT4 family of intracellular phosphate transporters. *New Phytologist* 177: 889-898

Teaster ND, Motes CM, Tang Y, Wiant WC, Cotter MQ, Wang Y-S, Kilaru A, Venables BJ, Hasenstein KH, **Blancaflor EB**, Chapman KD (2007) *N*-Acylethanolamine metabolism interacts with abscisic acid (ABA) signaling in *Arabidopsis thaliana*. *Plant Cell* 19:2454-2469

Samuels TD, Ju H-J, Ye C-M, Motes CM, **Blancaflor EB**, Verchot-Lubicz J (2007) Subcellular targeting and interactions among the potato virus X TGB proteins. *Virology* 367: 375-389

Rahman A, Bannigan A, Sulaman W, Pechter P, **Blancaflor EB**, Baskin TI (2007). Auxin, actin, and growth of the *Arabidopsis thaliana* primary root. *Plant Journal* 50: 514-528

Narasimhamoorthy B, **Blancaflor EB**, Bouton JH, Payton ME, Sledge MK (2007) A comparison of hydroponics, soil and root staining methods for evaluation of aluminum tolerance in *Medicago truncatula* germplasm. *Crop Science* 47:321-328

Wang Y-S, Shrestha R, Kilaru A, Wiant W, Venables BJ, Chapman KD, **Blancaflor EB** (2006) Manipulation of Arabidopsis fatty acid amide hydrolase expression modifies plant growth and sensitivity to *N*-Acylethanolamines. *Proceedings of the National Academy of Sciences, USA* 103: 12197-12202

Jones DL, **Blancaflor EB**, Kochian, LV, Gilroy S (2006) Spatial coordination of aluminium uptake, production of reactive oxygen species, callose production and wall rigidification in maize roots. *Plant, Cell and Environment* 29: 1309-1318.

Motes CM, Pechter P, Yoo C-M, Wang Y-S, Chapman KD, **Blancaflor EB** (2005) Differential effects of two phospholipase D inhibitors, 1-butanol and *N*-acylethanolamine (NAE), on in vivo cytoskeletal organization and Arabidopsis seedling growth. *Protoplasma* 226: 109-123

Liu J-Z, **Blancaflor EB**, Nelson RS (2005) The tobacco mosaic virus 126 kD protein, a constituent of the virus replication complex, alone or within the complex aligns with and traffics along microfilaments. *Plant Physiology* 138: 1853-1865

Ju H-J, Samuels TD, Wang Y-S, **Blancaflor EB**, Payton M, Mitra R, Krishnamurthy K, Nelson RS, Verchot-Lubicz J (2005) The potato virus X TGBp2 movement protein associates with ER-derived vesicles during virus infection. *Plant Physiology* 138: 1877- 1895

Zhang J-Y, Broeckling CD, **Blancaflor EB**, Sledge MK, Sumner LW, Wang Z-Y (2005) Overexpression of WXP1, a *Medicago truncatula* AP2 domain containing transcription factor gene, increases cuticular wax accumulation and enhances drought tolerance in transgenic alfalfa (*Medicago sativa*). *Plant Journal* 42:689-707

Shin H, Shin H-S, Guo Z, **Blancaflor EB**, Masson PH, Chen R (2005) Complex regulation of Arabidopsis AGR1/PIN2-mediated root gravitropic response and basipetal auxin transport by catharidin-sensitive protein phosphatases. *Plant Journal* 42: 188-200

Hou G, Kramer VL, Wang Y-S, Chen R, Perbal G, Gilroy S, **Blancaflor EB** (2004) The promotion of gravitropism in Arabidopsis roots upon actin disruption is coupled with the extended alkalinization of the columella cytoplasm and a persistent lateral auxin gradient. *Plant Journal* 39: 113-125 –cover image

Wang Y-S, Motes CM, Mohamalawari DR, **Blancaflor EB** (2004) Green fluorescent protein fusions to Arabidopsis fimbrin 1 for spatio-temporal imaging of F-actin dynamics in roots. *Cell Motility and the Cytoskeleton* 59: 79-93

Achnine L, **Blancaflor EB**, Rasmussen S, Dixon RA (2004) Co-localization of L-phenylalanine ammonia-lyase and cinnamate 4-hydroxylase for metabolic channeling in phenylpropanoid biosynthesis. *Plant Cell* 16: 3098-3109

Hou G, Hill JP, **Blancaflor EB** (2004) Developmental anatomy and auxin response of lateral root formation in *Ceratopteris richardii*. *Journal of Experimental Botany* 397: 685-693

**Blancaflor EB**, Hou G, Chapman KD (2003) Elevated levels of *N*-Lauroylethanolamine, an endogenous constituent of desiccated seeds, disrupt normal root development in *Arabidopsis thaliana* seedlings. *Planta* 217: 206-217

Hou G, Mohamalawari DR, **Blancaflor EB** (2003) Enhanced gravitropism of roots with a disrupted cap actin cytoskeleton. *Plant Physiology* 131:1360-1373

Xu P., **Blancaflor EB**, Roossinck MJ (2003) In spite of induced multiple defense responses, tomato plants infected with cucumber mosaic virus D satellite RNA succumb to systemic necrosis. *Molecular Plant Microbe Interactions* 16: 467-476

**Blancaflor EB**, Hou G, Mohamalawari DR (2003) The promotive effect of latrunculin B on gravitropism of maize roots is concentration dependent. *Advances in Space Research* 31:2215-2220

Kirshnamurthy K, Heppler M, Mitra R., **Blancaflor EB**, Payton M., Nelson RS, Verchot-Lubicz J. (2003) The potato virus X TGBp3 associates with the ER network for virus cell-to-cell movement. *Virology* 309: 135-151

Mitra R, Krishnamurthy K, **Blancaflor EB**, Payton M, Nelson RS, Verchot-Lubicz J (2003) The potato virus X TGBp2 protein association with the endoplasmic reticulum plays a role in but is not sufficient for viral cell-to-cell movement. *Virology* 312: 35-48- cover image

**Blancaflor EB**, Zhao L, Harrison MJ (2001) Microtubule organization in root cells of *Medicago truncatula* during development of an arbuscular mycorrhizal symbiosis with *Glomus versiforme*. *Protoplasma* 217: 154-165 –cover image

Fasano JM, Swanson SJ, **Blancaflor EB**, Dowd PE, Kao T-h., Gilroy S (2001) Changes in root cap pH are required for the gravity response of the *Arabidopsis* root. *Plant Cell* 13: 907-921.

Collings DA, Zsuppan G, Allen NS, **Blancaflor EB** (2001) Demonstration of prominent actin filaments in the root columella. *Planta* 212: 392-403

**Blancaflor EB** (2000) Cortical actin filaments potentially interact with cortical microtubules in regulating polarity of cell expansion in primary roots of maize (*Zea mays* L.). *Journal of Plant Growth Regulation* 19: 406-414. – cover image

Bibikova TN, **Blancaflor EB**, Gilroy S (1999) Microtubules regulate tip growth and orientation in root hairs of *Arabidopsis thaliana*. *Plant Journal* 17:657-665.

**Blancaflor EB**, Fasano JM, Gilroy S (1999) Laser ablation of root cap cells: Implications for models of graviperception. *Advances in Space Research* 24:731-738.

Hasenstein KH, **Blancaflor EB**, Lee JS (1999) The microtubule cytoskeleton does not integrate auxin transport and gravitropism in maize roots. *Physiologia Plantarum* 105:729-738.

**Blancaflor EB**, Jones DL, Gilroy S (1998) Alterations in the cytoskeleton accompany aluminum-induced growth inhibition and morphological changes in primary roots of maize. *Plant Physiology* 118:159-172.

**Blancaflor EB**, Fasano, J.M., Gilroy S (1998). Mapping the functional roles of cap cells in the response of *Arabidopsis* primary roots to gravity. *Plant Physiology* 116: 213-222

Legue V, **Blancaflor EB**, Wymer C, Fantin D, Perbal G, Gilroy S (1997) Cytoplasmic free calcium in *Arabidopsis* roots changes in response to touch but not gravity. *Plant Physiology* 114: 789-800.

**Blancaflor EB**, Hasenstein KH (1997) The organization of the actin cytoskeleton in vertical and graviresponding primary roots of maize. *Plant Physiology* 113: 1447-1455.

**Blancaflor EB**, Hasenstein KH (1995) Microtubule orientation and growth of *Zea mays* roots subjected to osmotic stress. *International Journal of Plant Sciences* 156: 774-783.-cover image

**Blancaflor EB**, Hasenstein KH (1995) Time course and auxin sensitivity of cortical microtubule reorientation in maize roots. *Protoplasma* 185: 72-82.

**Blancaflor EB**, Hasenstein KH (1993) Organization of cortical microtubules in graviresponding maize roots. *Planta* 191: 231-237.

### Invited Review Articles

Kim S-C, Chapman KD, **Blancaflor EB** (2010) Fatty acid amide lipid mediators in plants. *Plant Science* (accepted in revision).

Kilaru A, **Blancaflor EB**, Venables BJ, Tripathy S, Mysore KS, Chapman KD (2007) The *N*-acylethanolamine-mediated regulatory pathway in plants. *Chemistry and Biodiversity* 4: 1933-1955

**Blancaflor EB**, Wang Y-S, Motes CM (2006). Organization and function of the actin cytoskeleton in developing root cells. *International Review of Cytology* 252: 153-198 – cover image

**Blancaflor EB**, Masson PH (2003) Update on Plant gravitropism. Unraveling the ups and downs of a complex process. *Plant Physiology* 113: 1677-1690

**Blancaflor EB** (2002) The cytoskeleton and gravitropism in higher plants. *Journal of Plant Growth Regulation* 21: 120-136–cover image

**Blancaflor EB**, Gilroy S. (2000) Plant cell biology in the new millennium: new tools and new insights. *American Journal of Botany* 87:1547-1560 - cover image

## Book Chapters

Chapman KD, **Blancaflor EB** (2010) Fatty acid amide hydrolase and the metabolism of *N*-acylethanolamine lipid mediators in plants. In: Munnik T (Ed.). *Plant Lipid Signaling*. Plant Cell Monographs 16 (pp. 293- 306), Springer Verlag

Dyachok J, Yoo C M, Palanichelvam K. **Blancaflor EB** (2009). Sample preparation for fluorescence imaging of the cytoskeleton in fixed and living plant roots. In Gavin, R. H. (Ed.), *Cytoskeleton Methods and Protocols : Methods in Molecular Biology series*. (pp. 157-169). Totowa, New Jersey: Humana Press

Hou G, **Blancaflor EB**. (2009) Fern root development. In: Beeckman T (Ed). *Root Development. Annual Plant Reviews series*. (pp. 192-208). Malden, Massachusetts, USA, Blackwell Publishing

Valster AH, **Blancaflor EB** (2008) Mechanisms of gravity perception in higher plants. In: Masson PH, Gilroy S (eds). *Plant Tropisms*. Ames, Iowa USA, Blackwell Publishing, pp. 3-19

**Blancaflor EB**, Motes CM, Wang Y-S, Kang L, Mysore KS, Chapman KD (2006) *N*-acylethanolamines: Lipid mediators of plant cytoskeletal organization and response to environmental stress. In: Sanchez F, Quito C, Lopez-Lara IM, Geiger O (eds). *Biology of Plant Microbe Interactions Volume 5*. Minneapolis, Minnesota, APS press, pp. 163-170

Liu J-Z, **Blancaflor EB**, Nelson RS (2006). The structure of the tobacco mosaic virus replication complex is modulated by the 126-kDa protein and the complex traffics along microfilaments. In: Sanchez F, Quito C, Lopez-Lara IM, Geiger O (eds). *Biology of Plant Microbe Interactions Volume 5*. Minneapolis, Minnesota, APS press, pp. 410-415

**Blancaflor EB**, Chapman KD (2006) Similarities between endocannabinoid signaling in animal systems and *N*-acylethanolamine metabolism in plants. In: Baluška F, Mancuso S, Volkmann D (eds). *Communication in Plants – Neuronal Aspects of Plant Life*. Heidelberg, Germany, Spinger-Verlag, pp. 205-219

**Blancaflor EB**, Hasenstein K.H. (2000) Methods for detection and identification of F-actin organization in plant tissues. In: Staiger C, Baluška F, Volkmann D, Barlow PW, (eds). *Actin: A Dynamic Framework for Multiple Plant Cell Functions*. Dordrecht, The Netherlands: Kluwer Academic Publishers, pp. 601-618.

**Blancaflor EB**, Hasenstein K.H. (2000) Glycerol permeabilization improves F-actin visualization in vibratome-sectioned roots. *Microscopy and Microanalysis* 6 (Suppl 2: Proceedings): 470-471.

Fricker M.D., Parsons A, Tlaka M., **Blancaflor EB**, Gilroy S., Meyer A., Plieth C. (2001) Fluorescent probes for living plant cells. In: C. Hawes & B. Satiat-Jeunemaitre(eds.), *Plant Cell Biology, A Practical Approach*, Oxford, Oxford University Press, pp 35-84.

Fricker MD, Plieth C, Knight H, **Blancaflor EB**, Knight MR, White NS, Gilroy S (1999) Fluorescence and luminescence techniques to probe ion activities in living plant cells. *In: Mason W.T. (ed.). Fluorescent and Luminescent Probes for Biological Activity*, 2nd edition, Academic Press, London pp. 569-596

**Blancaflor EB**, Fasano JM, Gilroy S (1997) Laser ablation of cap cells in primary roots of *Arabidopsis thaliana* provides single cell resolution of the gravity-sensor. *In: Lynch J.P., Flores H.E., Eissenstat D. (eds.) Radical Biology: Advances and Perspectives on the Function of Plant Roots*. American Society of Plant Physiologist. Rockville, Maryland, pp. 343-345.

Hasenstein KH, Kuznetsov OA, **Blancaflor EB** (1996) Induction of root curvature by magnetophoresis and cytoskeletal changes during the graviresponse. *In: Kaldeich B. (ed.) Proceedings of the Sixth European Symposium on Life Sciences Research in Space*. European Space Agency, Noordwijk, The Netherlands, pp. 71-74.

## **PATENTS**

NBLE: 010US patent entitled "PLANT FATTY ACID AMIDE HYDROLASES"

## **INVITED SEMINARS**

Annual meeting of the NASA/NSF joint program in Plant Biology Network for Research on Plant Sensory Systems, Timberline Lodge, OR, September, 1997

Gordon Research Conference: Gravitational Effects on Living Systems, Colby-Sawyer College, New London, NH, July, 1998

Biology Department, Illinois Wesleyan University, Bloomington, IL, January 1999

Botany Department seminar series, North Carolina State University, Raleigh, NC, November 2000

Biology Department seminar series, University of North Texas, Denton, TX, October, 2001

34<sup>th</sup> Committee on Space Research (COSPAR) Scientific assembly, Houston, TX, October, 2002

Biology Department seminar series, Texas Woman's University, Denton, TX, November, 2002

Gordon Research Conference: Mechanotransduction and Gravity Signaling in Biological Systems, Connecticut College, New London, CT, July 2003

Biology Department seminar series, Texas A.M. University, College Station TX, December, 2003

Botany Department seminar series, Oklahoma State University, Stillwater, OK, March, 2004

15<sup>th</sup> Symposium in Plant Physiology, Pennsylvania State University, State College, PA, May, 2004

Botany Department seminar series, University of Oklahoma, Norman, OK, September, 2004

Department of Environmental and Plant Biology seminar series, Ohio University, Athens, OH, October 2004

School of Biological Sciences seminar series, Washington State University, Pullman, WA, November, 2004

Department of Biology seminar series, Oklahoma Christian University, Oklahoma City, OK, January, 2005

First Symposium on Plant Neurobiology, Florence, Italy, May, 2005

XII International Congress on Molecular Plant Microbe Interactions, Cancun, Mexico, December, 2005

Department of Biology seminar series, Midwestern State University, Wichita Falls, TX, March, 2006

2<sup>nd</sup> Pan American Workshop on Plant Membrane Biology, South Padre Island, TX, May, 2006

Department of Biochemistry and Molecular Biology seminar series, Oklahoma State University, Stillwater, OK, October, 2006

Department of Horticultural Sciences, Purdue University, West Lafayette, IN, May, 2007

Plant Biology and Botany Meeting, Minisymposium on ABA and Ethylene, Chicago, Illinois, July, 2007

Department of Biology seminar series, Midwestern State University, Wichita Falls, TX, April, 2008

Society for In Vitro Biology World Congress, Tucson, Arizona, June, 2008

Arkansas EPSCoR for Plant Powered Production (P3) training conference, Withrop Rockerfeller Center, Morillton, Arkansas, August, 2008

Department of Biological Sciences seminar series, Western Michigan University, Kalamazoo, Michigan, November, 2008

Plant Biology Graduate Group seminar series, University of California, Davis, California, April, 2009

Gordon Research Conference: Plant Metabolic Engineering, New Hampshire, July, 2009

Blancaflor- Noble Foundation

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American Society of Plant Biologist Meeting, Minority Affairs Symposium on Plant Cell Biology, Honolulu, Hawaii, July, 2009

Department of Biological Sciences seminar series, Texas AM University, College Station, Texas, November, 2009

Department of Plant Biology seminar series, University of Vermont, Burlington, Vermont, April, 2010

## **PROFESSIONAL ORGANIZATIONS**

American Society of Plant Biologists

American Society for Gravitational and Space Biology

Microscopy Society of America

Oklahoma Microscopy Society

## **SCIENTIFIC COMMUNITY SERVICES**

Associate Editor, Plant Signaling and Behavior, 2005- present

Served in various grant review panels for NSF, USDA and NASA from 2003-2009