

Daniel B. Szymanski

Address

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Education

University of Illinois	Ph.D.	1995	Plant Biology
University of Michigan	B.S.	1989	Natural Resources

Professional Appointments

2004-present	Associate Professor, Purdue University, Department of Agronomy
1999-2004	Assistant Professor, Purdue University, Department of Agronomy
1995-1999	Research Associate, University of Minnesota, Genetics and Cell Biology
1990-1995	Research Assistant, University of Illinois, Department of Plant Biology

Honors and Awards

2006	Study in a Second Discipline, Purdue University
1998-1999	NSF Cytoskeleton Training Grant Fellowship
1998	3-D Microscopy of Living Cells Course Study Award
1995	NSF Integrative Research in Plant Biology Fellowship
1994	Francis M. and Harlie M. Clark Research Support Grant
1992-1993	Cell and Molecular Biology Training Grant Fellowship
1990-1992	McKnight Fellowship in Plant Biology

Professional Activities

Society Membership:

Member American Association for the Advancement of Science
Member American Society of Cell Biology
Member American Society of Plant Biology

Associate Editor:

The Open Plant Science Journal

Chair:

Purdue University Life Science Graduate Program (PULSe)

Published Work

Refereed Journal Articles

1. Gawienowski, M.C., Szymanski, D., Perera, I.Y., Zielinski, R.E. Calmodulin isoforms in *Arabidopsis* encoded by multiple divergent mRNAs. **1993** Plant Mol Biol 22: 215-225.

2. Szymanski, D.B., Liao, B., Zielinski, R.E. Calmodulin isoforms differentially enhance the binding of cauliflower nuclear proteins and recombinant TGA3 to a region derived from the *Arabidopsis* Cam-3 promoter. **1996** *Plant Cell* 8: 1069-1077.
3. Oppenheimer, D.G., Pollock, M.A., Vacik, J., Szymanski, D.B., Ericson, B., Feldmann, K., Marks, M.D. Essential role of a kinesin-like protein in *Arabidopsis* trichome morphogenesis. **1997** *Proc Natl Acad Sci USA* 94: 6261-6266.
4. Szymanski, D.B., Klis, D.A., Larkin, J., Marks, M.D. *cot1*: a regulator of *Arabidopsis* trichome initiation. **1998** *Genetics* 149: 565-577.
5. Szymanski, D.B., Marks, M.D. *GLABROUS1* overexpression and the *TRIPTYCHON* gene regulate the *Arabidopsis* cell cycle and trichome cell fate. **1998** *Plant Cell* 10: 2047-2062.
6. Szymanski, D.B., Jilk, R., Pollack, S., Marks, M.D. Control of the *GLABROUS2* gene expression in *Arabidopsis* leaves and trichomes. **1998** *Development* 125: 1161-1171.
7. Szymanski, D.B., Marks, M.D., Wick, S.M. Organized F-actin is essential for normal *Arabidopsis* trichome morphogenesis. **1999** *Plant Cell* 11: 2331-2347.
8. Szymanski D.B., Lloyd A.M., Marks D.M. Progress in the molecular genetic analysis of trichome initiation and morphogenesis in *Arabidopsis*. **2000** *Trends Plant Sci* 5: 214-219.
9. Szymanski, D.B. *Arabidopsis* trichome morphogenesis: a genetic approach to studying cytoskeletal function. **2001** *J Plant Growth Regulation* 20: 131-140.
10. Qiu, J.L., Jilk, R., Marks, M.D., Szymanski, D.B. The *Arabidopsis* *SPIKE1* gene is required for normal cell shape control and tissue development. **2002** *Plant Cell* 14: 101-118.
11. Le, J., El-Assal, S.E.-D., Basu, D., Saad, M.E., and Szymanski, D.B. Requirements for *Arabidopsis* *ATARP2* and *ATARP3* during epidermal development. **2003** *Curr Biol* 13: 1341-1347.
12. El-Assal, S.E., Le, J., Basu, D., Mallery, E.L., Szymanski, D.B. **2004** *DISTORTED2* encodes an ARPC2 subunit of the putative *Arabidopsis* ARP2/3 complex. *Plant Journal* 38: 526-538.
13. El-Assal, S.E., Le, J., Basu, D., Mallery, E.L., and Szymanski, D.B. **2004** *Arabidopsis* GNARLED encodes a NAP125 homologue that positively regulates ARP2/3. *Curr. Biol.* **14**, 1405-1409.
14. Basu, D., El-Assal, S.E., Le, J., Mallery, E.L., and Szymanski, D.B. **2004** Interchangeable functions of *Arabidopsis* PIROGI and the human WAVE complex subunit SRA-1 during leaf epidermal morphogenesis. *Development* **131**, 4345-4355.
15. Szymanski, D.B. **2005** Breaking the WAVE complex: the point of *Arabidopsis* trichomes. *Curr. Opin. Plant Biol.* **8**, 103-112.
16. Basu, D., Le, J., El-Essal, S.E., Huang, S., Mallery, E., Koliantz, G., Staiger C.J., Szymanski, D.B. **2005** *DISTORTED3/SCAR2* is a Putative *Arabidopsis* WAVE Complex Subunit that Activates Arp2/3 Complex and is Required for Epidermal Morphogenesis. *Plant Cell* **17**, 502-524.
17. Le, J., Mallery, E.L., Zhang, C., Brankle, S., Szymanski, D.B. **2006** *Arabidopsis* BRICK1/HSPC300 is an essential subunit of the WAVE complex that selectively stabilizes the Arp2/3 activator SCAR2. *Curr. Biol.* **16**, 895-901

18. Zhang, C. , Mallery, E. L., Schlueter, J., Huang, S., Fan, Y., Brankle, S. Staiger, C.J., and Szymanski, D.B. **2008** Arabidopsis SCARs function interchangeably to meet ARP2/3-activation thresholds during morphogenesis. *Plant Cell* **20**, 995-1011.
19. Basu, D. , Le, J., Zakharova, T., Mallery, E.L., and Szymanski, D.B. **2008** A SPIKE1 signaling complex controls actin-dependent morphogenesis through the WAVE and ARP2/3 complexes. *PNAS USA* **105**, 4044-4049.

Invited Review

19. Szymanski, D.B. Tubulin folding cofactors: Half a dozen for a dimer. **2002** *Curr. Biol.* **12**: R767-R769.

To be Submitted Refereed Journal Articles

Kotchoni, S., Le, J., Zakhrova, T., El-Essal, E. , Szymanski, D. B. **2009** Arabidopsis ARPC4 controls ARP2/3 complex assembly and the association of the complex with the plant membrane system *Plant J.*

Zhang, C., Kotchoni, S., Mallery, E. , Szymanski, D.B. **2009** The DOCK family GEF SPIKE1 localizes to endoplasmic reticulum exit sites and controls organelle morphology. *J. Cell Biology*

Halsey, L., Miller, N., Szymanski, The geometric rules of pavement cell morphogenesis in the dicot *Arabidopsis thaliana* *The Open Plant Science Journal*

To be Submitted Invited Review Articles

Cosgrove, D., Szymanski D.B., **2009** The mechanical control of plant cell shape *Current Biology* (Special issue on the cytoskeleton and cell shape control). June 2009

Zhang, C., Kotchoni, S., Szymanski, D.B., Integrated cellular systems during plant cell morphogenesis. *Curr. Opin. Plant Biol., Cell Biology* December 2009

Refereed Book Chapters

1. Szymanski, D.B. The role of actin during *Arabidopsis* trichome morphogenesis. In: *Actin: A Dynamic Framework for Multiple Plant Cell Functions* (Staiger, C.J. et al., eds.) Kluwer **2000** pp. 391-410.
2. Szymanski, D.B. *Arabidopsis thaliana*: The premiere model plant. In: *Encyclopedia of Genetics* (Brenner, S. and Miller, J.H., eds.) Academic Press **2001** pp. 87-90.

3. Beilstein, M., and Szymanski, D. Cytoskeletal requirements during *Arabidopsis* trichome development. In: *The Plant Cytoskeleton in Cell Differentiation and Development* (Hussey P., ed.) Blackwell, Oxford, UK, **2004** pp. 265-289.
4. Ritchie, R., Szymanski, D.B., Wiley, H, and Nielsen, N. Targeting induced local lesions in genomes-TILLING, in *Legume Crop Genomics*. (Brummer, C. and Wilson, R.F., eds.) AOCS Press, Champaign, IL. **2004** pp. 105-129

Educational Book

1. Koliantz, G., Szymanski, D.B. 2006 Genetics: A Laboratory Manual ed: K. Barbarick, ASA editor in chief, American Society of Agronomy Inc. and Crop Science Society of America, Inc., Madison, WI

Published Abstracts

1. Basu, D., Le, J., El-Assal, S.E.-D., Huang, S., Zhang, C., Mallery, E.L., Koliantz, G., Staiger, C.J., and Szymanski, D.B. DISTORTED3 is an Arabidopsis WAVE complex subunit that activates ARP2/3 during epidermal morphogenesis. The Cytoskeleton in Health and Disease, 2nd Annual Chicago Cytoskeleton Symposium, Chicago, IL, 2004.
2. Le, J., Mallery, E., Basu, N., Santos-Serna, J., Nielsen, E., and Szymanski, D. Use of the Arabidopsis “distorted group” mutants to understand ARP2/3 complex function and organelle dynamics. Keystone symposia, Keystone, CO, 2004.
3. Le, J., El-Assal, S.E.-D., Basu, D., Mallery, E.L., and Szymanski, D.B. Arabidopsis distorted trichome mutants: actin related protein 2/3 complex in plants. Mechanisms in Plant Development, FASEB summer conference, Vermont, 2004.
4. Le, J., El-Assal, S.E.-D., Basu, D., Mallery, E.L., and Szymanski, D.B. ARP2/3 complex is required for Arabidopsis epidermal development. The Cytoskeleton in Health and Disease, 2nd Annual Chicago Cytoskeleton Symposium, Chicago, IL, 2004.
5. Le, J., El-Assal, S.E.-D., Basu, D., Mallery, E.L., Zhang, C., and Szymanski, D.B. WAVE complex subunit genes *PIROGI* and *GNARLED* positively regulate ARP2/3 in Arabidopsis. The Cytoskeleton in Health and Disease, 2nd Annual Chicago Cytoskeleton Symposium, Chicago, IL, 2004.
6. Szymanski, D.B. SPIKE1- dependent cell morphogenesis: direct and essential interaction with inactive ROP GTPase. Plant Biology, Lake Buena Vista, FL, 2004.
7. Szymanski, D.B. Arabidopsis Arp2/3 complex is required for epidermal morphogenesis. Cellular Mechanisms of Plant Development, Sixth Annual Fall Symposium, Donald Danforth Plant Science Center, St Louis, MO, 2004.
8. Szymanski, D.B. The function of ARP2/3 complex in Arabidopsis epidermal development. Cellular Mechanisms of Plant Development, Sixth Annual Fall Symposium, Donald Danforth Plant Science Center, St Louis, MO, 2004.
9. Szymanski, D.B. WAVE-complex subunit genes *GNARLED* and *PIROGI* positively regulate ARP2/3 in Arabidopsis. Cellular Mechanisms of Plant Development, Sixth Annual Fall Symposium, Donald Danforth Plant Science Center, St Louis, MO, 2004.

10. Szymanski, D.B. SPIKE1, a Dock-family protein is a putative Guanidine Exchange Factor for Rho-like small GTPases in Arabidopsis. Chicago Cytoskeleton Meeting, Special Symposium: Cytoskeleton and Diseases, Chicago, IL, 2004.
11. El-Assal, S.E., Le, J., Basu, D., Mallery, E.L., Szymanski, D.B. Arabidopsis ARP2/3 complex is required for epidermal morphogenesis, Donald Danforth Plant Science Center, 6th annual fall symposium, Cellular mechanisms of plant Development September 24,25, 2004.
12. Le, J. El-Assal, S.E., Basu, D., Mallery, E., Szymanski, D. WAVE complex proteins GNARLED and PIROGI positively regulate Arp2/3 activity in Arabidopsis, Donald Danforth Plant Science Center, 6th annual fall symposium, Cellular mechanisms of plant Development September 24,25, 2004.
13. Jie Le, Eileen Mallery, Erik Nielsen, Dan Szymanski, Use of the Arabidopsis “distorted group” mutants to understand ARP2/3 complex function and organelle dynamics. Keystone Symposia Traffic control: Rab GTPases in vesicular transport, Breckenridge, CO, January 20-25, 2004.
14. Le, J. El-Assal, S.E., Mallery, E.M., Szymanski, D.B., Arabidopsis “DISTORTED” mutants: Actin related protein 2/3 complex in plants, FASEB Summer Research Conferences, Mechanisms in Plant Development, Saxtons River, Vermont, August 7-11, 2004.
15. El-Assal, S.E., Le, J., Basu, D., Mallery, E.L., Szymanski, D.B. Arabidopsis ARP2/3 complex is required for epidermal morphogenesis, Donald Danforth Plant Science Center, 6th annual fall symposium, Cellular mechanisms of plant Development September 24,25, 2004.
16. Le, J. El-Assal, S.E., Basu, D., Mallery, E., Szymanski, D. WAVE complex proteins GNARLED and PIROGI positively regulate Arp2/3 activity in Arabidopsis, Donald Danforth Plant Science Center, 6th annual fall symposium, Cellular mechanisms of plant Development September 24,25, 2004.
17. Zhang, C., Brankle, S., Mallery, E., Szymanski D. Composition and Function of the Arabidopsis WAVE Complex During Epidermal Morphogenesis, 16th International Conference on Arabidopsis Research, Madison, WI June 15-19, 2005
18. Brankle, S. Le, J., Zakharova, T., Szymanski, D., Genetic dissection of ARP2/3 functions in Arabidopsis, 16th International Conference on Arabidopsis Research, Madison, WI June 15-19, 2005
19. Basu, D., Mallery, E.L., Szymanski, D.B. SPIKE1, a DOCK-family protein, is a Guanine Nucleotide Exchange Factor for Rho Of Plants (ROP) and positively regulates the WAVE-ARP2/3 pathway, 16th International Conference on Arabidopsis Research, Madison, WI June 15-19, 2005.
20. Le, J., Basu, D., Mallery, E., Zakharova, T., Szymanski, D. Function and regulation of ARP2/3 complex during Arabidopsis epidermal development. 16th International Conference on Arabidopsis Research, Madison, WI June 15-19, 2005.
21. Basu, D., Le, J., Mallery, E.M., Szymanski, D. SPIKE1 is a guanine nucleotide exchange factor (GEF) for ROP GTPase and may regulate the heteromeric WAVE and ARP2/3 complexes during epidermal morphogenesis, ASPB Annual Meeting, Seattle, WA, July 16-20, 2005.
22. Le, J., Zakharova, T., Szymanski, D.B. A functional analysis of ARP2/3 regulation and function in Arabidopsis, ASPB Annual Meeting, Seattle, WA, July 16-20, 2005.

23. Zhang, C., Zakharova, T., Le, J., Mallery, E., Szymanski, D.B. Discovering the function of WAVE-ARP2/3-generated actin filaments during plant cell morphogenesis. 17th International Conference on Arabidopsis Research, Madison, WI June 28-July 2, 2006
24. SPIKE1 is a guanine nucleotide exchange factor that positively regulates ROP small GTPases and controls an evolutionarily conserved pathway of actin-dependent cell morphogenesis
Dipanwita Basu, Taisiya Zakharova, Eileen Mallery, Daniel Szymanski 17th International Conference on Arabidopsis Research, Madison, WI June 28-July 2, 2006
25. Basu, D., Le, J., Zakharova, T., Mallery, E., Szymanski, D. SPIKE1 and ARP2/3 in the morphogenesis of the epidermis, Plant and Fungal Cytoskeleton, Andover, NH, August 20-25, 2006
26. Blandford, M., Paris, M., Szymanski, D., Andrisani, O. Mechanism of neurite formation during differentiation of CAD cells, Louisiana State University Symposium of Neurobiology, August 13-15, 2006, Baton Rouge, LA
27. Zhang, C, Le, J., Basu, D., Mallery, E., Zakharova, T., Szymanski, D. Arabidopsis and maize cell-cell adhesion mutants may reduce pretreatment costs prior to fermentation, Biofuels: regional needs, national challenges, May 17,18 2007, Purdue University

Published Undergraduate Research Abstracts

27. Brankle, S. Le, J., Zakharova, T., Szymanski, D., Genetic dissection of ARP2/3 functions in Arabidopsis, ASPB Annual Meeting, Seattle, WA, July 16-20, 2005.
28. Jefferson, K., Koliantz, G., Eggert, A., Szymanski, D.B. The use of Arabidopsis distorted trichome mutants to understand actin-dependent growth in plants, Abstract #252, American Society of Plant Biology (Selected for an oral and poster presentation), Denver, CO, August 3-7, 2002.

Unpublished Meeting Abstracts

1. Saad, M., Szymanski, D. Protein-protein interactions of the SPIKE1 cytoskeleton regulator. Iowa State Plant Sciences Institute Symposium: "Proteomes: structures, changes, interactions, and functions," Ames, IA, June 20-23, 2002.

Other Publications

1. Szymanski, D.B. DNA-protein interactions throughout the *Arabidopsis* CALMODULIN-3 gene. 1995 Ph.D. Thesis, University of Illinois.
2. Koliantz, G., Szymanski D.B. Agronomy 421 Laboratory Manual. 2001, 2002.

Research Grants and Awards

Current

DOE/ THE ARABIDOPSIS WAVE COMPLEX: MECHANISMS OF LOCALIZED ACTIN polymerization
\$515,000 (9/1/05- 12/31/09)

NSF/ SPIKE1: novel mechanisms of ROP activation and actin-based morphogenesis
\$575,976 (3/1/07-2/29/10)

Past

NSF/ MECHANISMS OF PLANT CELL MORPHOGENESIS:ARP/3 FUNCTION AND TRICHOME DISTORTION IN ARABIDOPSIS
\$270,000 (8/1/04 – 7/31/06)

USDA / A functional approach to understanding SPK1 signaling, cytoskeletal dynamics, and morphogenesis
\$130,000 (9/1/02- 12/31/04)

NSF / A genetic approach to understanding cellular morphogenesis
\$341,000 (8/1/01- 7/31/04)

DOE / A functional analysis of actin-dependent growth in plant cells
\$300,000 (10/1/02- 9/30/05)

USDA / Regulation of F-actin during leaf epidermal development
\$216,000 (12/15/99- 12/31/02)

Purdue / School of Agriculture Ross Fellowships; Soybean improvement through genomics
\$66,000 (8/15/03-8/14/05)

NSF / Undergraduate research supplement: Screen for distorted trichome mutants and fine mapping of the *DISTORTED4* and *GNARLED* genes
\$11,000 (6/1/02- 5/31/03)

Equipment grants

NSF / Equipment grant, wide-field fluorescence microscopy of living cells
\$210,000

NSF, Ultracentrifugation and plant cell fractionation
29,750

NSF/ Multi-User Instrumentation Grant, A cryo-field emission scanning electron microscope
\$ 400,000

Funded Interdisciplinary Research Proposals

Dr. Szymanski is a Co-P.I. (Dr. Ken Robinson, P.I.; Co-P.Is. Dr. David Asai, Dr. Chris Staiger) on a successful equipment proposal to obtain an ultrasensitive wide-field fluorescence microscope. *Wide field fluorescence microscopy of living cells* (NSF, MUI grant, amount \$210,000).

Dr. Szymanski is a Co-P.I. (Co-P.Is: Dr. Clint Chapple, Dr. Joe Ogas, Dr. Jeanne Romero-Severson, Dr. Lauren McIntyre) in a successful grant to establish microarray technology at Purdue. *Establishment of Arabidopsis microarray tools* (School of Agriculture seed grant, amount \$25,000).

Dr. Szymanski is the lead P.I. (Co-P.Is. Dr. Cliff Weil, Dr. Scott Jackson, Dr. Niels Nielsen) in an interdisciplinary project that utilizes both metabolic and gene expression profiling to identify important genes in sterol synthesis in seeds. *Correlative gene expression and metabolic profiling of soybean accessions* (School of Agriculture Ross Fellowships, 2 students, 2 years of support for each, \$66,000).

Invited Plenary Lectures

1. *Cell shape mutants offer insight into cytoskeletal function*. 11th International Conference on Arabidopsis Research, Session chair, Madison, WI, June 2000.
2. *Plant and Fungal Cytoskeleton*. Gordon Research Conference, Andover, NH, August 2000.
3. *A genetic approach to understand morphogenesis*. American Society of Plant Biology National Meeting, Denver, CO, August 2002.
4. *Arabidopsis DISTORTED1 encodes a plant actin-related protein ATARP3*. 14th International Conference on Arabidopsis Research, Session chair, Madison, WI, June 2003. Plenary Symposium Speaker, Session chair.
5. *Distorted insights into ARP2/3 and WAVE Complex Functions in Plants*, Plant and Fungal Cytoskeleton. Gordon Research Conference, Andover, NH, August 2004. Plenary Symposium Speaker.
6. *WAVE and ARP2/3 Complexes Control Actin-dependent Growth in Arabidopsis*, Chicago Cytoskeleton, Northwestern Medical School, Chicago, Il, November 2004.
7. *SPIKE1 and ARP2/3 in the morphogenesis of the epidermis*, Plant and Fungal Cytoskeleton, Andover, NH, August 20-25, 2006.

8. Molecular modules controlling actin polymerization and morphogenesis, 10th Plant and Fungal Cytoskeleton Meeting, Bargo, Italy, August 2008.
9. Rac signalling scaffolds and the cellular control of actin filament nucleation, Chicago Cytoskeleton, Chicago, IL, October 2008.

Interdisciplinary programs: Seminar Series Speaker

8. *Signaling to the WAVE and Arp2/3 complexes during epidermal morphogenesis in Arabidopsis*, Colorado State University, Cell and Molecular Biology program, December 1, 2005.
9. *Arabidopsis trichome morphology mutants: DISTORTED insights into novel and evolutionarily conserved cytoskeleton control mechanisms*, Ohio State University, Molecular Cellular and Developmental Biology Program, April 3, 2006

Seminar Series Speaker

10. *An integrated approach to study cytoskeleton function in Arabidopsis*. Purdue University, Department of Chemistry, November 19, 1999.
11. *Trichome development and morphogenesis genes*. Indiana University Purdue University Indianapolis, March 31, 2000.
12. *The cytoskeleton and plant morphogenesis*. Cold Spring Harbor Laboratory, July 20, 2001.
13. *Actin-dependent morphogenesis in plant cells*. North Dakota State University, Department of Botany, March 1, 2001.
14. *Live cell imaging in plant cells*. University of Illinois, McKnight Program Lecture, February 3, 2001.
15. *Trichome development and morphogenesis genes*. University of Illinois, Department of Agronomy, April 18, 2001.
16. *Distorted group mutants and actin-dependent growth in plants*. Chicago Cytoskeleton Group, Northwestern Medical School, November 15, 2002.
17. *Trichome morphology mutants and signaling to the cytoskeleton*. Danforth Plant Sciences Center, May 15, 2002.
18. *SPK1 may encode a novel ROP GEF*. University of Michigan, Department of Molecular, Cellular, and Developmental Biology, April 18, 2002.
19. *Growth control mechanisms in plants*. Purdue University, Department of Botany and Plant Pathology, January 29, 2003.
20. *WAVE-ARP2/3 Pathway Controls Epidermal Morphogenesis*, Purdue Biochemistry Department, Purdue University, September 2004.
21. *Trichome distortion in Arabidopsis: functional insights into actin-dependent morphogenesis*. Chicago Cytoskeleton Group, Northwestern Medical School, November 19, 2004
22. *A SPIKE1-WAVE-ARP2/3 Pathway Controls Epidermal Morphogenesis*, Indianapolis University Medical School, IUPUI, February 2005.
23. *Cell shape control in plants: spatial organization of small GTPase signals and actin cytoskeleton responses*, BGSU, Dept. of Biology Seminar series, September 2008.

24. *Pulled by the hairs: from microscopy to mutants and back again* Midwest Microscopy Consortium Annual Meeting, Ann Arbor, Mi. , December , 2008.

Student Awards

Graduate:

Dipanwita Basu: 2006 Dept. of Agronomy, Graduate Student Research Award, Departmental student travel award, ASPB travel award, Best Poster: Donald Danforth Plant Sciences Center, Honorable Mention: Purdue Life Sciences poster competition.

Undergraduate:

Liz Corbett: Best undergraduate poster, Purdue University Undergraduate Science Competition

Keyntissha Jefferson, ASPB travel award

Steven Brankle: ASPB travel award

Invited student lectures

1. Jefferson, K., Koliantz, G., Eggert, A., Szymanski, D.B. The use of Arabidopsis distorted trichome mutants to understand actin-dependent growth in plants, Abstract #252 , American Society of Plant Biology (Selected for an oral and poster presentation), Denver, CO, August 3-7, 2002.
2. Basu, D., Le, J., Mallery, E.M., Szymanski, D. SPIKE1 is a guanine nucleotide exchange factor (GEF) for ROP GTPase and may regulate the heteromeric WAVE and ARP2/3 complexes during epidermal morphogenesis, ASPB Annual Meeting, Seattle, WA, July 16-20, 2005.
3. Le, J. El-Assal, S.E., Mallery, E.M., Szymanski, D.B., Arabidopsis “DISTORTED” mutants: Actin related protein 2/3 complex in plants, FASEB Summer Research Conferences, Mechanisms in Plant Development, Saxtons River, Vermont, August 7-11, 2004.

Student Awards

Graduate

1. Dipanwita Basu Agronomy Graduate student research award 2006
2. Dipanwita Basu, Danforth Plant Sciences Symposium, Best Poster Award 2004
3. Dipanwita Basu, Honorable Mention: Purdue Life Sciences poster competition 2005
4. Mohammed Saad, Iowa State University Proteomics symposium, travel award 2002

Undergraduate

5. Keyntissha Jefferson, ASPB undergraduate travel award
6. Steven Brankle: ASPB travel award
7. Liz Corbett: Best undergraduate poster, Purdue University Undergraduate Science Competition

Graduate Research Training: Dr. Szymanski, advisor

Nita Basu, Ph.D. 2006, Agronomy, *Identification of new spike1 mutant alleles and SPIKE1-binding proteins.*

Don Livingstone Ph. D. 2006 candidate, co-advisor, *Identification, characterization, and modification of differentially expressed genes from soybean*

Chunhua Zhang, Ph. D. candidate, Plant Biology Program, *Comparative analyses of cotton fiber and Arabidopsis trichome morphogenesis.*

Undergraduate Research Training

Dori Lin: *Developing molecular markers for mapping in F2 populations* 2007

Jiang Hwang: *Reverse genetic analysis of candidate targets of SPK1 regulation* 2007

Steven Brankle: *Reverse genetic approaches to knock out ARP2/3 genes*

Kendra Meade, NSF Undergraduate Research Supplement, *Fine mapping of DOUGHBOY*

Honors project: *Reverse genetic analysis of Arabidopsis ELMO genes*

Liz Corbette, *A screen for genetic suppressors and enhancers of PIROGI*

Keynttisha Jefferson, NSF Undergraduate Research Supplement, *Fine mapping of DISTORTED4.*

Allison Eggert, ASPB Fellowship, Hughes Fellowship, *Fine mapping of DISTORTED1.*

Mercedes Davis, MARC/AIM Fellowship student, *High-throughput identification of T-DNA insertion sites.*

Tanika Spidell, MARC/AIM Fellowship student, *Complementation of the distorted3 mutant.*

Zhara Khorammi, *Molecular mapping of distorted mutants.*

Megan O'Shaughnessey, *Distorted mutant screen and fine mapping of GNARLED.*

Post-doctoral Research Training

Current:

Tsaiya Zhakharova *Biochemical analysis of SPK1, WAVE, and ARP2/3 complexes*

Prior:

Jie Le, *Cytological analysis of the distorted group trichome mutants.*

Salah El-Din El-Essal, *Map-based cloning of distorted group genes.*

Mike Persans, *Expression pattern of the DISTORTED3 gene.*

Jin-long Qiu, *Cloning and characterization of the SPIKE1 gene.*

High School Student Research Training

Lisa Cupp, *Isolation of the distorted5 mutant.*

Rotation Student Training

Jim Henderson, Ph.D. Plant Biology Program, *Baculovirus expression of SPIKE1 protein.*

Jake Stout, Ph.D. Plant Biology Program, *Characterization of Actin-GFP.*

Gun Nam, Ph.D. Plant Biology Program, *DIS3 protein localization.*

Advisory and/or Preliminary Exam Committees

Youran Fan, Ph.D., Forestry Natural Resources	2008
Parul Khurana, Ph.D., Biology	2008
Amr Ibrahim, Ph.D. Botany/Plant Pathology	2008
Jennifer Verburg, Ph.D. Biology	2008
Brooklyne Coulter, Ph.D. Agronomy	2008
Taksina Sinlapadech, Ph.D. Biochemistry	2006 Graduated
Faisal Chaudhry, M.S. Biology	2005 Graduated
Woei-Jiun Guo, Ph.D. Horticulture	2005 Graduated
Jen Victor, M.S.. Botany/Plant Pathology	2005 Graduated
Hui Chun Li, Ph.D. Biochemistry	2004 Graduated
Cicero Deschamps, Ph.D. Horticulture	2002 Graduated
Griffith Jones, M.S. Agronomy	2002 Graduated
Michael Thompson, M.S. Biochemistry	2002 Graduated
Amber Shirley, Ph.D. Biochemistry (preliminary exam only)	2001 Graduated

Ad-hoc Reviewer for Journals

Bioessays
Current Biology
Development
Developmental Biology
Genes and Development
Plant Biology
Plant Journal
Plant Cell
Plant Molecular Biology
Plant Physiology
Protoplasma
Science
Trends in Plant Science

Ad-hoc Reviewer for Federal Grant Review Panels

USDA, Plant Growth and Development
Department of Energy, Basic Energy Biosciences
National Science Foundation, Molecular and Cellular Biology
National Science Foundation, Plant and Microbial Genetics

TEACHING EXPERIENCE

Courses Taught

Agry 320 Genetics 3 Credits (Dr. Szymanski 1.5 credits, Dr. Weil 1.5 credits)
Total number of students taught: 628

Genetics (AGRY320) is a required course for many non-majors in the School of Agriculture. Dr. Szymanski's primary goals in teaching Genetics 320 are to: 1) emphasize the basic principles of

genetics; 2) generate excitement about the fascinating science of genetics; 3) educate students about the science behind many of the ethical issues that surround modern applications of genetics. Despite a general apprehension toward genetics, several students rated Dr. Szymanski's course among the best. Great effort was taken to ensure that students at all levels could succeed in the course. Supplementary instruction included biweekly evening help sessions, weekly standing appointments with students who needed extra help, and the organization of study groups that included both excellent students and those who were struggling. Posting the notes on the web before class helped students concentrate on listening to lectures rather than copying figures. Evaluation tools were intended to both reward students who worked hard to understand the material, and to challenge those with an aptitude for genetics. In general, the students felt this delicate balance was handled fairly.

Agry 530 Genetics 3 Credits (Dr. Szymanski, 2 units, Dr. Weil 1 unit)
Total number of students taught: 48

Dr. Herb Ohm and Dr. Dan Szymanski used the information obtained from the Plant Breeding and Genetics group meetings (see below) to revise Plant Genetics, AGRY530. Plant Genetics AGRY530 provides the basis for advanced coursework and research in plant genetics. The new course content is designed to provide a consistent and relevant introduction to important topics in plant genetics. Drs. Ohm and Szymanski taught the course for the first time in the fall of 2001, and the course is now team taught by Dr. Szymanski and Dr. Weil. The course is intended to provide a solid basis for advanced graduate courses in plant genetics.

Courses Supervised and Designed

Agry 321 Genetics Lab 1 credit
Current enrollment: 53 students

After teaching Genetics 320 lecture for the first time it was apparent to Dr. Szymanski that the genetics lab course was in desperate need of revision and reorganization. The lab exercises were not coordinated with the material presented in the lecture and in many cases had little to do with genetics. With support from the Department of Agronomy and the School of Agriculture, Dr. Szymanski redesigned the course. Dr. Gregore Koliantz, a technician in Dr. Szymanski's laboratory, wrote the instruction manual and tested the lab exercises. Each chapter of the new lab manual includes an introduction to the techniques and also covers the "real world" relevance of the experiment for the students. After two years of use, it is our intention to publish the lab manual and make it available to other universities. The revised Genetics 321 course has been offered since the fall semester of 2001. Consistent positive written evaluations and student performance on quizzes and exams indicate that Dr. Szymanski's new course is successful and is accepted by the students.

Non-Purdue Teaching Experience

1993 Teaching Assistant, Biology 101, University of Illinois
1998 Lecturer, Cell Biology Lab, University of Minnesota
1998 Guest Lecturer, Developmental Genetics, University of Minnesota

Service

University-wide Committees or Service

WSLR Microscopy Facility, Steering committee	1999-present
Purdue Electron Microscopy Consortium, Steering committee	2001-present
PULSe Recruitment committee	2003-present
Plant Biology Program, Admissions committee	2000-2003
Purdue Genetics Program, Professional Activities, Chair	2002-2004
Purdue Genetics Program, Genomics Symposium Committee	2002
Biology Department, Plant Genetics Faculty Search Committee	2001-2002

Seminar Invitations

Invited/Hosted Dr. David Marks, University of Minnesota, for the Plant Biology Program
Invited/Hosted Dr. Liam Dolan, John Innes Institute, for the Plant Biology Program
Invited/Hosted Dr. Roger Hangarter, Indiana University, for the Plant Biology Program
Invited/Hosted Dr. J.C. Jiang, Ohio State University, Department of Agronomy
Invited/Hosted Dr. Sam Huang, Danforth Center, Department of Agronomy
Invited/Hosted Dr. Todd Vision, University of North Carolina, Plant Biology Seminar Series

School of Agriculture Committees or Service

Agriculture Faculty Grievance Committee	2000-2004
Hatch Proposal Review Committee	
Cliff Weil, Agronomy	2006
Cindy Nakatsu, Agronomy	2006
Burkhard Shultz, Horticulture	2005
Jeff Volenec, Agronomy	2003
Joe Ogas, Agronomy	2003
Wilfred Vermerris, Agronomy	2002
Cliff Weil, Agronomy	2001
Bob Pruitt, Botany Plant Pathology	2001
Clint Chapple, Biochemistry	2000

Departmental Committees and Service

Soybean Genetic Chair Search Committee	2006
Agronomy Research Retreat Committee	2006
Agronomy Scholarship Committee	2004-present
Agronomy Department Head Advisory Committee	2001-present
Agronomy Department Graduate Committee	2000-2004
Keim Family Scholarship Committee, Chair	2002, 2003
Comparative Genomics Search Committee	2003
USDA Wheat Molecular Geneticist Search Committee	2002
F.L. Patterson Memorial Lecture Committee	2000 - 2004
Maize Geneticist Search Committee	2001
Agronomy Field Day, poster presenter	2000