

## Michael J. Zanis

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### Current positions

**National Research Council Senior Research Fellow**  
NOAA, Northwest Fisheries Science Center

**Assistant Professor**  
Department of Botany and Plant Pathology, Purdue University

### Areas of specialization

- Plant Systematics
- Evolution
- Genomics
- Computational Biology
- Phylogenetics
- Bioinformatics
- Molecular Ecology and Evolution
- Evolutionary Developmental Biology

### Appointments held

2012-present	<b>National Research Council Senior Research Fellow</b> NOAA, Northwest Fisheries Science Center
2005 – present	<b>Assistant Professor</b> Department of Botany and Plant Pathology, Purdue University
2002 – 2005	<b>NIH Post-doctoral Fellow</b> Department of Biology, University of California, San Diego
1996 – 2002	<b>Graduate Teaching Assistant</b> School of Biological Sciences, Washington State University

### Education

2002	<b>PhD in Botany, Applied Minor in Statistics,</b> School of Biological Sciences, Washington State University
1995	<b>BS in Biology,</b> Biology Department, University of Massachusetts, Dartmouth

### Teaching Experience

*Primary instructor*  
**Introduction to Plant Science (BTNY 210)**  
Purdue University, Fall 2006, 2007, 2008

**Introduction to Phylogenetics (BTNY 590Z)**

Purdue University, Fall 2006, 2008, 2010

*Guest lecturer*

**Mechanisms of Plant Development (BTNY 553)**

Purdue University, Spring 2007

**Introduction to Ecology and Evolution (BIOL 286)**

Purdue University, Spring 2008, 2010

**Principles of Plant Systematics (BTNY 530)**

Washington State University, Spring 2000

**General Genetics (GENCB 301)**

Washington State University, Fall 2001

*Graduate teaching assistant, Washington State University*

Introductory Biology (nonmajors; BIOL 102); Introductory Biology (majors; BIOL 103, BIOL 104); Introduction to Botany (nonmajors; BTNY 120); General Genetics (GENCB 301); Systematic Botany (BTNY 332)

Publications

Tucker, RC, **Zanis, MJ**, Emery, N Gibson, K. 2011 Effects of water depth and population on the vegetative growth of southern wild rice (*Zizania aquatica*) *Aquatic Botany* 94: 113-118

Gustin, JL, **Zanis, MJ**, Salt, DE. 2011 Structure and evolution of the plant cation diffusion facilitator family of ion transporters. *BMC Evolutionary Biology* 11: 76

Sindhu, A, Chintamanai, S, Brandt, AS, **Zanis, MJ**, Scofield, SR, Johal, GS. 2008. Guardian of Grasses: Specific Origin and Conservation of a Unique Disease Resistance Gene in the Grass Lineage. *PNAS*. 105: 1762-1767.

**Zanis, MJ** 2007. Grass spikelet genetics and duplicate gene comparisons. *International Journal of Plant Sciences*. 168:93-110.

Whipple, CJ, **Zanis, MJ**, Kellogg, EA, Schmidt, RJ. 2007. Conservation of B class gene expression in the second whorl of a basal grass and outgroups links the origin of lodicules and petals. *PNAS*. 104: 1081-1086.

Qiu YL, Dombrowska O, Lee J, Li LB, Whitlock BA, Bernasconi-Quadroni F, Rest JS, Davis CC, Borsch T, Hilu KW, Renner SS, Soltis DE, Soltis PS, **Zanis, MJ**, Cannone JJ, Gutell RR, Powell M, Savolainen V, Chatrou LW, Chase MW 2005. Phylogenetic analyses of basal angiosperms based on nine plastid, mitochondrial, and nuclear genes. *International Journal of Plant Sciences*. 166: 815-842.

Kim S, Soltis DE, Soltis PS, **Zanis, MJ**, Suh Y. 2004. Phylogenetic relationships among early-diverging eudicots based on four genes: were the eudicots ancestrally woody? *Mol Phylogenet Evol*. 1:16-30.

Soltis, DE, Senters, AE, **Zanis, MJ**, Kim, S, Thompson, JD, Soltis, PS, De Craene, LPR, Endress, PK, and Farris, JS. 2003. Gunnerales are sister to other core eudicots: Implications for the evolution of pentamery. *American Journal of Botany* 90: 461-470

**Zanis, MJ**, Soltis DE, Soltis PS, Qiu Y-L, Zimmer EA. 2003. Phylogenetic analyses and perianth evolution in basal angiosperms. *Annals of the Missouri Botanical Garden* 90: 129-150

Nickrent, DL, Blarer, A, Qiu, Y-L, Soltis, DE, Soltis, PS, **Zanis, MJ**: 2002 Molecular data place Hydnoraceae with Aristolochiaceae. *American Journal of Botany* 89: 1809-1817

Soltis, DE, Soltis PE, **Zanis, MJ**: 2002 Phylogeny of seed plants based on evidence from eight genes. *American Journal of Botany* 89: 1670-1681

**Zanis, MJ**, Soltis DE, Soltis PS, Mathews S, Donoghue MJ: 2002 The root of the angiosperms revisited. *PNAS* 99: 6848-6853

Soltis, DE, Kuzoff, RK, Mort, ME, **Zanis, MJ**, Fishbein, M, Hufford, L, Koontz, J, Arroyo, MK: 2001 Elucidating deep-level phylogenetic relationships in Saxifragaceae using sequences for six chloroplastic and nuclear DNA regions *Annals of the Missouri Botanical Garden*, 88: 669-693

Qiu Y-L, Lee J, Bernasconi-Quadroni F, Soltis DE, Soltis PS, **Zanis, MJ**, Zimmer EA, Chen Z, Savolainen V, Chase MW. 2000. Phylogeny of basal angiosperms: Analysis of five genes from three genomes. *International Journal of Plant Science*; 161:S3-S27

Soltis DE, Soltis PS, Chase MW, Mort ME, Albach DC, **Zanis, MJ**, Savolainen V, Hahn WH, Hoot SB, Fay MF, Axtell M, Swensen SM, Prince LM, Kress WJ, Nixon KC, Farris JS. 2000. Angiosperm phylogeny inferred from 18S rDNA, rbcL, and atpB sequences. *Botanical Journal of the Linnean Society*; 133:381-461

Soltis PS, Soltis DE, **Zanis, MJ**, Kim S: Basal Lineages of Angiosperms: Relationships and Implications for Floral Evolution. *International Journal of Plant Science* 2000; 161:S97-S107.

Qiu Y-L, Lee J, Bernasconi-Quadroni F, Soltis DE, Soltis PS, **Zanis, MJ**, Zimmer EA, Chen Z, Savolainen V, Chase MW. 1999. Evidence of the Earliest angiosperms from mitochondrial, plastid and nuclear genomes. *Nature*; 402:404-407.

Les DH, Schneider EL, Padgett DJ, Soltis PS, Soltis DE, **Zanis, MJ**. 1999. Phylogeny, classification and floral evolution of water lilies (Nymphaeaceae; Nymphaeales): A synthesis of non-molecular, rbcL, matK, and 18S rDNA data. *Systematic Botany*; 24:28-46.

#### Publications in preparation

(\*serve(d) as major professor or co-advisor for these students, ^undergraduate students)

Tucker, RC\*, **Zanis, MJ**, Emery, N Gibson, K. In revision. Early season shading, seed provenance, and genetic population structuring influences the growth of wild rice (*Zizania aquatica* L.)

Walker, JF^, and **Zanis, MJ** in prep. The effects of mononucleotide repeats on the genome of *Arabidopsis lyrata* and *Arabidopsis thaliana*.

**Zanis, MJ** and Sharp JL in prep. An Approximate Bayesian Computation approach to estimating the timing and diversification of the Green Tree Of Life.

Andreatta, M., Walker, JF^, and **Zanis, M.J.** in prep. Evolutionary bioinformatic analyses identifies complex evolutionary processes driving the diversification of transcription factors in green plants.

**Zanis, M.J.**, Erickson, E<sup>^</sup>, Merrick, K<sup>^</sup>, Croy, B<sup>^</sup> in prep. Phylogenetic reconstructions of life history variation across 180 million years of flowering plant diversification.

Andreatta, M., Walker, JF<sup>^</sup>, and **Zanis, M.J.** in prep. Illumina transcriptome sequencing of the *Codium fragilis* and the evolution of morphologically complex Chlorophyte algae.

Morton, P, Sharp, JL, and **Zanis, MJ** in prep Large-scale insect and angiosperm phylogenies reveal 200 million years of macroevolutionary patterns of co-diversification

**Zanis, MJ**, Walker<sup>^</sup>, JF, Walker, SA, and Tucker, RC in prep. Molecular Ecology and genetic diversity of *Zizania* sp.

\*Wuersig, R and **Zanis, MJ** in prep. Natural History of C class MADS-box genes across angiosperms. American Journal of Botany

\*Wuersig, R and **Zanis, MJ** in prep. Determining the phylogenetic position and evolution of Equisetum MADS-box genes using large-scale genome resources. Molecular Phylogenetics and Evolution

\*Walker, SA, \*Tucker, RC Gibson, KD, Emery, N and and **Zanis, MJ.** in prep. Inter and intraspecific molecular evolution of developmental loci in species of *Zizania* (North American Wild Rice). Molecular Ecology

Giraldo-Calderon, GI, and **Zanis, MJ** and Hill, CA. in prep. Mosquito vision: Molecular evolution and functional characterization of the opsins in *Anopheles gambiae* and *Aedes aegypti*. Molecular Biology and Evolution

\*McCalla, SG, **Zanis, MJ**, Sepulveda, MS, Hook, T, and Nichols, KM. in prep. Patterns of genetic diversity of *Diporeia* in the Great Lakes. Molecular Ecology

### Abstracts

Walker, JF and Zanis MJ 2012 The effect of mononucleotide repeats and gene stability across eukaryotes. 2013 Annual Meeting of the Society for Integrative and Comparative Biology

Zanis, MJ 2011. Mechanisms of evolutionary developmental processes acting within a species: A key step in understanding between species evo-devo differences. XVIII International Botanical Congress, Melbourne, Australia

Zanis, MJ 2010. Challenges associated with inferring phylogenetic relationships of multigene families involved in the evolution of development. Botanical Society of America Annual Meeting, Providence, Rhode Island.

Zanis, MJ 2010. Ecological and evolutionary factors shaping gene function during polyploidy. Botanical Society of America Annual Meeting, Providence, Rhode Island.

Wuersig, R and Zanis, MJ. 2010. The Natural History of C and D class MADS-box Genes: Insights from Phylogenetic Analyses. Botanical Society of America Annual Meeting, Providence, Rhode Island.

Walker, JF, Walker, SA, Tucker, RC, Morton, PK, Emery, NC, Gibson, KD, and Zanis, MJ. 2010. The Evolution and biogeography of *Zizania* sp. based on chloroplast, mitochondrial, and nuclear gene sequence data. Botanical Society of America Annual Meeting, Providence, Rhode Island.

Walker, SA, Walker, JF, Tucker, RC, Morton, PK, Emery, NC, Gibson, KD, and Zanis, MJ 2010. Patterns of Molecular Evolution Across Developmental Genes in *Zizania* Species (North American wild rice). Botanical Society of America Annual Meeting, Providence, Rhode Island.

Tucker, RC, Zanis, MJ, Emery, NC, and Gibson, KD. 2010. Effects of water depth and population on the vegetative growth of southern wild rice (*Zizania aquatica*). 95th Ecological Society Of America Meeting, Pittsburgh, Pennsylvania

Giraldo-Calderon, GI, and Zanis, MJ and Hill, CA. Mosquito vision: Molecular evolution and functional characterization of the opsins in *Anopheles gambiae* and *Aedes aegypti*

Walker, SA, Tucker, Zanis, MJ. 2009. Molecular evolution of developmental genes in *Zizania* sp. (North American Wild Rice). Society for Molecular Biology and Evolution. Iowa City, Iowa.

Zanis, MJ, Walker, SA, Tucker. 2009. Molecular evolution of developmental genes in *Zizania* sp. (North American Wild Rice). Evolution Meeting, Moscow, ID.

Zanis, MJ, Walker, SA, Tucker, RC, Emery, NC, Gibson, KD. 2009. Molecular evolution of developmental genes in *Zizania* sp. (North American Wild Rice). ASPB Evolution of Development in Plants, UC Riverside.

Giraldo-Calderon, GI, Van Zee, JP, Meyer, JM, Zanis, MJ, Hill, CA. 2008. Mosquito vision: Molecular evolution and functional characterization of the opsins in *Anopheles gambiae* and *Aedes aegypti* Entomological Society of America. Reno, Nevada.

Wuersig, R, and Zanis, MJ. 2008. The Natural History of C-class Genes: Independent Duplication Events in Diverse Angiosperm Lineages. Botanical Society of America. Vancouver, B.C. Canada.

Shakirov, EV, Song, X. Zanis, MJ, Croy, J, Wuttke, D. and Shippen, DE. Evolution of POT genes in Plants. Botany (Joint meeting between Botanical Society of America and American Society of Plant Biologists), 2007, Illinois

Wuersig, R, and Zanis, MJ. Duplication and diversification of C-class genes across angiosperms. Botany (Joint meeting between Botanical Society of America and American Society of Plant Biologists), 2007, Illinois

Chintamanai, S, Sindhu, A, Brandt, AS, Zanis, MJ, Scofield, SR, Gurmukh, JS. Revised role of an old disease resistance gene of maize as a savior of grasses. Maize Meeting. 2007, Illinois.

Gallavotti, A. Zanis, MJ, Yang, Y, Schmidt, RJ, and Jackson, D. Visualization of polar auxin transport during maize vegetative and reproductive branching. Maize Meeting. 2007, Illinois.

Zanis, MJ, Schmidt, RS, Kellogg, EA: ZAG1 and ZMM2 Gene Duplication. Maize Meeting. 2006, California.

Zanis, MJ Schmidt, RS, Kellogg, EA: The dynamics of gene duplications in grasses. Abstract: Botanical Society of America meeting 2004 Snowbird, Utah.

Zanis, MJ Soltis, DE, Soltis, PS. Isolation and characterization of floral MADS Box genes from *Nuphar* and *Illicium*. Botanical Society of America Annual Meeting, 2001, Albuquerque, New Mexico.

Zanis, MJ, Soltis, DE, Soltis PS, Suh, Y, Qiu, Y-L, Zimmer, EA. 1999. Poster-- Phylogenetic relationships of monosulcate angiosperms based on *rbcL*, *atpB*, 18S rDNA, and 26S rDNA sequences. XVI International Botanical Congress, 1999 St. Louis, Missouri.

Presentations*Invited*

Zanis, MJ 2011. Power and pitfalls of inferring evolutionary relationships among multigene families. The Field Museum, Chicago, Illinois.

Zanis, MJ 2011. Mechanisms of evolutionary developmental processes acting within a species: A key step in understanding between species evo-devo differences. XVIII International Botanical Congress, Melbourne, Australia

Zanis, MJ 2008. iPlant workshop on the tree of life. Biosphere II. University of Arizona.

Zanis, MJ 2008. Challenges of inferring multigene families. Kavli Frontiers of Science, U.S. National Academy of Sciences Arnold and Mabel Beckman Center, Irvine, California

Zanis, MJ 2006. The diversification of the ABC model of flower development: C class gene duplication and subfunctionalization in the grasses. Kansas State University.

Zanis, MJ 2006 ZAG1 and ZMM2 gene duplication. Maize Meeting 2006 California.

Zanis, MJ 2005 Evolution and dynamics of gene duplication in grasses. ASPB. Mechanisms of Genetic Variation in Plants. Snowbird, Utah

Zanis, MJ 2005 Evolution and dynamics of gene duplication in grasses. Wabash College, Crawfordsville, Indiana

Zanis, MJ 2002 Phylogenetic relationships among basal angiosperms and future directions in floral research. University of Florida, Gainesville, Florida

*Contributed*

Zanis, MJ. 2010. Challenges associated with inferring phylogenetic relationships of multigene families involved in the evolution of development. Botanical Society of America Annual Meeting, Providence, Rhode Island.

Zanis, MJ. 2010. Ecological and evolutionary factors shaping gene function during polyploidy. Botanical Society of America Annual Meeting, Providence, Rhode Island.

Zanis MJ, Schmidt, RS, Kellogg, EA. 2004. The dynamics of gene duplications in grasses. Abstract: Botanical Society of America meeting, Snowbird, Utah.

Zanis, MJ, Schmidt, RS, Kellogg, EA. 2003. The duplication and subfunctionalization of the ZAG1/ZMM2 MADS-box gene in grasses Society for the Study of Evolution Annual Meeting, California State University at Chico, California

Zanis MJ, Soltis, DE, Soltis, PS. 2001 Isolation and characterization of floral MADS Box genes from Nuphar and Illicium. Botanical Society of America Annual Meeting, Albuquerque, New Mexico.

Zanis MJ, Soltis, DE, Soltis, PS. 2001. Will we ever unravel relationships among basal angiosperms? Society for the Study of Evolution Annual Meeting, University of Tennessee, Knoxville, Tennessee.

Zanis, MJ, Soltis, DE, Soltis, PS, Qiu, Y-L., Zimmer, EA. 1997. Phylogenetic relationships among monosulcate angiosperms. Society for the Study of Evolution Annual Meeting, University of British Columbia, Vancouver, Canada.

Honors & Awards

- 2009 Richard L. Kohls Outstanding Undergraduate Teacher Lecture Award
- 2008 Kavli Fellow (Jointly sponsored by the US National Academy of Sciences and The Kavli Foundation)

#### Grants Funded

- 2012-2013 National Research Council Senior Research Fellowship: Ecological and conservation genomics of southern resident killer whales, *Orcinus orca*: \$90,000.
- 2011 – 2012 Purdue University, Department of Botany and Plant Pathology  
**Using second-generation sequencing technologies to understand plant evolutionary genetics**, PI: Michael Zanis, co-PI: Nancy Emery, \$15,000
- 2006 – 2008 U.S. Department of Agriculture  
**Enhancing science capacity in introductory animal, plant, and food sciences courses**, PI: Neil A. Knobloch, Co PIs: Bryan Hains, University of Kentucky; Mark Balschweid, University of Nebraska (External Evaluator); Tameshia Ballard, Purdue University; Colleen Brady, Purdue University; Levon Esters, Purdue University; John Graveel, Purdue University; Mickey Latour, Purdue University; Andrea Liceaga, Purdue University; Kathryn Orvis, Purdue University; Mary Rossano, University of Kentucky; Lori Snyder, Purdue University; William Sylvania, University of Kentucky; Michael Zanis, Purdue University, \$466,074
- 2006 – 2008 Purdue University, Agricultural Research Programs  
**Fate of duplicate gene in flowering plants**, PI: Michael Zanis, \$30,000
- 2002 – 2005 National Institutes of Health, Individual NRSA postdoctoral fellowship  
**Fate and consequences of a gene duplication in eukaryotes**, PI: Michael Zanis, \$100,000.
- 2002 U.S. Department of Agriculture, Plant Genetic Mechanisms  
**Fate and consequences of a gene duplication in grasses**, PI: Michael Zanis. \$89,510  
*\*Funding declined for this grant due to acceptance of the NIH award.*
- 2002 National Science Foundation, Doctoral Dissertation Improvement Grant  
**Molecular systematics, perianth diversification, and developmental genetics in basal angiosperms**, PI: Michael Zanis. \$4,413

#### Additional Grants, Awards, & Fellowships

Purdue University International Travel Award, 2011, \$1000  
 Graduate Student Summer Research Award, Washington State University, 2000, \$2000  
 Karling Graduate Student Research Award, Washington State University, 1999, \$500  
 Sigma Xi Grant-in-Aid of Research, 1999, \$700  
 American Society of Plant Taxonomists Grant for Graduate Student Research, 1999, \$1000  
 College of Sciences Minigrant, Washington State University 1999, \$200  
 International Botanical Congress Student Travel Grant, 1999, \$500  
 Biddulph Summer Research Award, Washington State University, 1999, \$500  
 College of Sciences Minigrant, Washington State University, 1998, \$200  
 Betty W. Higinbotham Trust, Washington State University, 1997 - 2001, \$7857

Undergraduate & high school students mentored in research (Purdue University)

<u>Name</u>	<u>Program</u>	<u>Year(s)</u>
Erica Alsop	Botany Summer Research program	2007
Susan Sellers	Botany Summer Research program	2008
Sheryl Walker	Biology Undergraduate Research Credit	2008-2010
Joseph Walker	Biology Undergraduate Research Credit	2009-2012
Brittany Croy	Biology Undergraduate Research Credit	2010-2012
Kayla Merrick	Biology Undergraduate Research Credit	2010-2012
Emily Erickson*	Biology Undergraduate Research Credit	2010-2012
Mary Grace Erickson*	Senior High School Research Project	2011-2012

\*Emily Erickson began as a high school student in my lab. Her high school research with me won her a bronze medal at the regional science fair and she was selected to present her research at the state science fair. The research she did in my lab as an undergraduate at Purdue helped her be named "outstanding freshman in the College of Agriculture."

\*Mary Grace Erickson won gold in plant science and runner up for overall science at the regional science fair. She was selected to present her work at the state science fair. Mary Grace was also awarded a \$300.00 grant from the Indiana Academy of Science for her work with me.

Graduate Students & Post-docs mentored

<u>Name</u>	<u>Department</u>	<u>Degree</u>	<u>Year of Degree</u>
<i>As major professor:</i>			
Renate Wuersig	Botany & Plant Pathology	PhD	2012
Sheryl Walker	Botany & Plant Pathology	MS	2011
Matthew Andreatta	Botany & Plant Pathology	PhD	2013
Philip Morton	Botany & Plant Pathology	Post-doc	2009 - 2010
<i>As co-major professor:</i>			
Clay Britton	Botany & Plant Pathology	PhD	2009
Sunnie McCalla	Biological Sciences	MS	2010
Rebecca Tucker	Botany & Plant Pathology	MS	2011
<i>As a committee member but with significant consultation:</i>			
Sally Chambers	Botany & Plant Pathology	PhD	2014
Gloria Giraldo	Entomology	PhD	2012
Sarah Knapke	Botany & Plant Pathology	MS	2006
Michelle Jensen	Botany & Plant Pathology	MS	2011
David La	Biological Sciences	PhD	2010
Mirayda Torres	Agronomy	PhD	2012

*As a committee member:*



Matthew Andreatta	Horticulture	MS	2011
Asya Ayrapetov	Botany & Plant Pathology	PhD	2014
Christian Hans	Agronomy	PhD	2010
Emily Indiolo	Botany & Plant Pathology (PULSe)	PhD	2009
Luke Jacobus	Entomology	PhD	2006
Anne Sophie Knoeller	Horticulture	PhD	2009
Zhiging Lai	Botany & Plant Pathology	PhD	2009
Nicholas Marra	Forestry & Natural Resources (PULSe)	PhD	2013
Rachel Nodurft	Botany & Plant Pathology	PhD	2008
Reazur Rahman	Biological Sciences	PhD	2009
Brian Rinner	Forestry & Natural Resources	MS	2010
Julie Scardina	Biological Sciences	MS	2012
Jeffrey Webb	Entomology	PhD	2006
Jing-Ke Weng	Biochemistry	PhD	2009

### Outreach Activities

2007-present	Advanced Life Science (ALS) credit program This program allows qualified high school students to obtain college credits. I have worked with a high school teacher, Byron Ernest from Lebanon, Indiana to integrate his class and teaching with BTNY 210. As part of this program, I also taught two additional laboratories for his high school class here at Purdue.
2010	Science Olympiad, lecturer, "Plant Evolution" Taught 20 U.S. science Olympiad finalists
2010	Hoosier Agribusiness Science Academy, lecturer, "Plant Biology" Gave a lecture to urban high school students as part of this Academy
2009	Elementary School Science Fair Project consultant (student: Chase Latour, Cumberland Elementary School) Helped design the student's science fair project which won best science poster and Purdue University's elementary school science fair exhibition

### University and Departmental Services (Purdue University)

#### *Departmental Service*

2010-2011	Graduate Student Recruitment Committee
2009-2010	Graduate Student Recruitment Committee
2008-2009	Faculty Search Committee
2007-2008	Systems Biologist hire, Department of Botany and Plant Pathology Faculty Search Committee
2006-2007	Systems Biologist hire, Department of Botany and Plant Pathology Faculty Search Committee

2006-2008 Bioinformatician hire 75% Statistics 25% School of Agriculture  
2006-2007 Graduate Student Recruitment Committee  
2006-2007 Seminar Committee  
2006-2007 Graduate Recruitment Web Page

*College of Agriculture Service*

2009-2010 School of Agriculture Graduate Council  
2006-2008 School of Agriculture Graduate Council  
2007-2008 College of Agriculture Web Committee  
2007 Advance Life Science Credits for Botany 210

*University Service*

2006-2008 PULSe Graduate Student Recruitment Committee

Professional Service

*Grant review panel:* NSF, Integrative and Organismal Systems Cluster, Developmental Mechanisms

*Review editor:* Frontiers in Plant Genetics and Genomics.

*Journal ad hoc reviewer:* American Journal of Botany, Proceedings of the National Academy of Sciences, Plant Cell, Molecular Biology and Evolution, Molecular Phylogenetics and Evolution, Plant Physiology, and International Journal of Plant Sciences.

Professional Societies

American Society of Plant Biologists  
Botanical Society of America  
American Society of Plant Taxonomists  
Phycological Society of America  
Genetics Society of America  
The Society for the Study of Evolution  
Society of Systematic Biologists

References

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Peter B. Goldsbrough, PhD  
Professor and Department Head  
Department of Botany and Plant Pathology  
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Northwest Fisheries Science Center  
2725 Montlake Blvd E  
Seattle, WA 98112  
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