Curriculum Vitae
DANIEL M. VERNON

Arthur G. Rempel Professor of Biology
Department of Biology, and Program in Biochemistry, Biophysics & Molecular Biology
Whitman College, Walla Walla, WA 99362 USA *e-mail*: vernondm@whitman.edu

EDUCATION

1992 Ph.D., Molecular & Cellular Biology, University of Arizona, Tucson, AZ. Dissertation: "Molecular Biology of Salinity Tolerance in the Facultative Halophyte *M. crystallinum*" Advisor: Hans J. Bohnert

1986 B.A., Biology, Oberlin College, Oberlin, Ohio

FACULTY & RESEARCH POSITIONS

2013- Arthur G. Rempel Professor of Biology, Whitman College

2005-20 Director, Program in Biochemistry, Biophysics & Molecular Biology (BBMB), Whitman College [2005-06, 2010-11, 2014-15, 2016-17, 2018-19, 2019-20]

2009-12 Professor of Biology, Biology Department, Whitman College

2002-07 Chair, Biology Department, Whitman College [2002; 2004-2007]

2001-09 Associate Professor of Biology, Whitman College

1999-00 Visiting Faculty, Dept of Molecular & Cellular Biology, Univ of Arizona, Tucson

1995-01 Assistant Professor of Biology, Whitman College [Visiting Asst. Professor, 1995-97]

1992-95 NSF Post-Doctoral Fellow in Plant Biology, Laboratory of Dr. David Meinke, Dept. of Botany, Oklahoma State University, Stillwater, OK

1992 Post-Doctoral Research Associate, Laboratory of Dr. Hans J. Bohnert, Department of Biochemistry, University of Arizona, Tucson, AZ (August-October, 1992)

1986-92 Graduate Research Associate, Laboratory of Dr. Hans J. Bohnert, Department of Molecular & Cellular Biology, University of Arizona, Tucson, AZ

1985-86 Undergraduate Research, Dr. Richard Levin, Department of Biology, Oberlin College

AWARDS

2013- Endowed Professorship - Arthur G. Rempel Professor of Biology, Whitman College

2005 G. Thomas Edwards Award for Excellence in Teaching & Scholarship, Whitman College

1993-95 National Science Foundation Post-Doctoral Fellowship in Plant Biology

1987-88 University of Arizona Graduate Academic Scholarship

1986-87 Univ. of Arizona Graduate Fellowship in Molecular & Cellular Biology

GRANTS FOR RESEARCH & EDUCATION

[*Indicates peer-reviewed external funding]

2013-2021 Perry/Summer Research Awards (Whitman College, internal funds) [8 grants for 14 student projects]

2012-2020 S.A. Abshire Awards (Whitman College, internal funds) 4 @ $600-$1200 awards for 4 projects

2014 M.J. Murdock Charitable Trust, "Start-up Research Package for New Position in Biology and BBMB", $30,000, Award #2014207 [Proposal co-author and Chair of search committee]

2013 *ASPB Summer Undergraduate Research Fellowship Award. $4700. Research and travel support for a student, American Soc. of Plant Biologists [only 3 awarded to PUI faculty nationwide]

GRANTS FOR RESEARCH & EDUCATION (continued)

[*Indicates peer-reviewed external funding]

2012 HHMI Summer Research grant (Whitman College, internal funds), $13,000. Funding for 2 student research projects

2011-12 *NSF $41,700. Supplement for NSF grant "PIRL1 and PIRL9 - novel plant LRR proteins required for pollen viability" [*PI*; research grant]

2006-11 *NSF - Integrative Plant Biology program. $360,525. "PIRL1 and PIRL9- novel plant intracellular LRR proteins required for pollen viability". [*PI*; research grant]

2010 *NSF $549,446 *Co-PI,* MRI: Acquisition of a Laser Scanning Confocal Microscope to Build an Integrative Life Sciences Imaging Program at Whitman College [*PI: G. Withers*]

2009 *NSF $408,000. *Co-PI,* MRI: An Environmental Scanning Electron Microscope for Multidisciplinary Research & Undergraduate Research at Whitman College." [*PI: K. Nicolaysen*]

2007 *NSF $464,934. *Co-PI,* MRI: An X-Ray diffraction Instrument for interdisciplinary and collaborative research and education in an undergraduate setting [*PI: D. Juers*]

2006 M.J. Murdock Charitable Trust, "Start-up Research Package for New Position in Biology", $30,000 [Proposal author and Chair of search committee]

2005 *NSF ROA supplement; $19,700 [*PI*, supplement to another lab's grant (NSF 0348028) for sabbatical travel and research; *May-June 2005*]

2003-05 *WM Keck Foundation; Whitman College Integrative Biology Initiative; $340,000 [Principle author & administrator; Institutional award for equipment and curriculum improvements]

2002-05 *USDA Plant Growth &Development program; $150,000; "Functional Investigation of Plant LRR Proteins Related to Components of the RAS Signaling Pathway" [*PI*; research grant]

2001-03 *M.J. Murdock Charitable Trust, research grant; $35,500; "Reverse-genetic Investigation of a Family of Novel Leucine-Rich Repeat Proteins in Arabidopsis thaliana". [*PI;* research grant]

1997-01 *NSF Plant Devel. Mechanisms; $206,758 (incl. REU supplements); "Mechanisms of Embryo-genesis in Arabidopsis: Characterization of the *twn*1 & *emb*88 Mutants." [*PI*; research grant]

1996 Murdock summer research grant (Whitman College, internal funds). $12,000 for 2 student projects

1995 NSF special faculty start-up award [associated w/ NSF post-doctoral fellowship]; $3500

PATENT

Transgenic Plants with Altered Polyol Content (*co-inventor*; United States Patent #5,563,324)

PROFESSIONAL SERVICE & SOCIETIES

Outside evaluator for faculty tenure/promotion decisions: College of William & Mary, Beloit College, Colby College, Franklin & Marshall College, New College of Florida, Bennington College

Conference and Workshop Organization/Participation:

2016 Career Mentoring Group, 24th Intl. Congress on Plant Reproduction, Tucson, AZ

2014 *Invited speaker*, University of Washington Future Faculty Fellows Workshop, Seattle, WA

2014 *Invited Panel Member*, PUI Career Workshop, 25th Intl. Conf. Arabidopsis Research, Vancouver, B.C.

2007 *Invited Panel Member*, Laboratory Leadership Workshop, ASPB meetings, Chicago, IL

2005 *Coordinator*, Meeting of PUI working group; ASPB meetings, Seattle, WA

2002 *Session Chair* (Development session), ASBP meetings, Denver, CO

PROFESSIONAL SERVICE & SOCIETIES (continued)

2002 *Conference organizer*: Murdock Undergraduate Research Conference, Whitman College. [A large regional undergraduate conference with participants from 18 colleges and universities]

Peer-review of proposals for research funding agencies:
Federal Ministry of Education & Research (Germany), GABI-Future program;
U.S. National Science Foundation - Integrative Plant Biology & Plant Developmental Mechanisms programs
U.S. Dept. of Agriculture - Plant Genetic Mechanisms & Plant Growth & Development programs
NSERC (Canada); Natural Environment Research Council, Directorate of Science and Technology (UK)
American Society of Plant Biologists SURF program (grants supporting undergraduate research)
Private Foundations: W.J. Murdock Trust; American Philosophical Society; Jeffress Memorial Trust.

Peer-review for professional journals: Trends in Plant Sciences; Genome; The Plant Cell; The Plant Journal; Developmental Biology; J. of Experimental Botany; Plant Physiology & Biochemistry; Planta; Plant Science; Physiologia Plantarum; Am. J. of Botany; Int. J. of Plant Sci; The Journal of Plant Research; Thai J. of Agricultural Research; Annals of Botany; Developmental Dynamics

Professional Societies: American Society of Plant Biologists; American Assoc. for Advancement of Science.

PUBLICATIONS

[* denotes Whitman student co-authors; **Bold** designates peer-reviewed journals]

Forsthoefel NR, Klag KA*, McNichol SR*, Arnold CE*, Vernon CR, Wood WW* & Vernon DM (2018) Arabidopsis *PIRL6* is essential for male and female gametogenesis and is regulated by alternative splicing. **Plant Physiology**, 178:1154-1169 [www.plantphysiol.org/cgi/doi/10.1104/pp.18.00329]

Vernon DM, Forsthoefel NF (2018) *PIRL6* alternatively spliced mRNA sequences A-F [six cDNA sequences], accessions MH618667-MH618672, NIH GenBank database, https://www.ncbi.nlm.nih.gov/genbank/

Stanton K, Edger PP, Puzey JR, Kinser T, Cheng P*, Vernon DM, Forsthoefel NR, Cooley A (2017) A Whole Transcriptome Approach to Identification of Novel Reference Genes for Quantitative Gene Expression Studies in *Mimulus.* **Genes, Genomes, Genetics,** 7 [DOI: https://doi.org/10.1534/g3.116.038075]

Forsthoefel NR, Klag KA*, Simeles BP*, Reiter R*, Brougham L*, Vernon DM (2013) The Arabidopsis *PIRL* family and the value of reverse genetic analysis for identifying genes that function in gametophyte development. **Plants**, 2: 507-520 [DOI: 10.3390/plants2030507]

Forsthoefel NR & Vernon DM (2011) Effect of sporophytic *PIRL9* genotype on post-meiotic expression of the Arabidopsis *pirl1;pirl9* mutant pollen phenotype. **Planta**, 233:423-431 [DOI:10.1007/s00425-010-1324-5]

Forsthoefel NR, Dao TP*, and Vernon DM (2010) PIRL1 and PIRL9, Encoding Members of a Novel Family of Plant Leucine-rich Repeat Proteins, Are Essential for Differentiation of Microspores into Pollen. **Planta**, 232(5):1101-1114. [DOI: 10.1007/s00425-010-1242-6]

Chen T, Martin D, Nayak N, Majee S, Lowenson J, Schäfermeyer KR, Eliopoulos AC, Lloyd TD, Villa S, Dinkins R, Perry SE, Forsthoefel NR, Clarke SG, Vernon DM, Zhou Z, Rejtar T, and Downie AB. (2010) Substrates of the *Arabidopsis thaliana* PIMT1 identified using seed phage display cDNA libraries and biopanning with recombinant enzyme. **J. Biol. Chem.,** 285:37281-37292 [DOI:10.1074/jbc.M110.157008]

Forsthoefel NR, Cutler K*, Port MD*, Yamamoto T*, & Vernon DM (2005) PIRLs: A novel class of plant intracellular leucine rich repeat proteins. **Plant & Cell Physiology**, 46: 913-922 [DOI: 10.1093/pcp/pci097]

Cushing DA*, Forsthoefel NR, Gestaut DR*, Vernon DM (2005) *Arabidopsis emb*175 and other *ppr* knockout mutants reveal essential roles for PPR proteins in plant embryogenesis. **Planta**, 222: 424-436 [>100 citations]

Vernon DM & Forsthoefel NR (2002) Leucine-rich repeat proteins in plants: diverse roles in signaling and development. Research Signpost: Recent Research Developments in Plant Biology. 2: 201-214.

PUBLICATIONS (continued)

Tax FE & Vernon DM (2001) T-DNA associated duplication/ rearrangements in *Arabidopsis*: implications for reverse genetics and functional genomics. **Plant Physiology**, 126:1526-1537 [>100 citations]

Vernon DM, Hannon MJ*, Le M-P*, Forsthoefel NR (2001) An expanded role for the *TWN*1 gene in embryogenesis: defects in cotyledon pattern and morphology in the *twn*1 mutant of *Arabidopsis*. **American Journal of Botany**, 88(4), 570-582.

Schwartz B, Vernon DM, Meinke DW (1997) Development of the Suspensor: Differentiation, Communication, & Programmed Cell Death during Plant Embryogenesis. *Adv. in Cellular & Molecular Biol. of Plant Seed Development, v 2* (BA Larkins & IK Vasil, eds) Kluwer Press, Dordrecht, The Netherlands, pp53-72

Vernon DM and Meinke DW (1995) The Late *embryo-defective* Mutants of *Arabidopsis*, **Developmental Genetics**, 16, 311-320

Forsthoefel NR, Vernon DM, Cushman JC (1995) A Salinity-Induced Gene from the Halophyte *M. crystallinum* Encodes a Glycolytic Enzyme, Phosphoglyceromutase, **Plant Molecular Biol.**, 29, 213-226.

Vernon DM and Meinke DW (1994) Embryogenic Transformation of the Suspensor in *twin*, a Polyembryonic Mutant of *Arabidopsis*, **Developmental Biology**, 165, 566-573 [>100 citations]

Vernon DM, Tarczynski MC, Jensen RG, Bohnert HJ (1993) Cyclitol Production in Transgenic Tobacco, **The Plant Journal**, 4(1), 199-205.

Vernon DM, Ostrem JA, Bohnert HJ (1993) Stress Perception and Response in a Facultative Halophyte: The Regulation of Salinity-Induced Genes in *M. crystallinum,* **Plant, Cell & Environment**, 16, 437-444.

Vernon DM and Bohnert HJ (1992) A Novel Methyl Transferase Induced by Osmotic Stress in the Facultative Halophyte *M. crystallinum*, **EMBO Journal**, 11(6), 2077-2085. [>100 citations]

Vernon DM and Bohnert HJ (1992) Increased Expression of an Inositol Methyl Transferase in *M. crystallinum* is Part of a Stress Response Distinct from CAM Induction, **Plant Physiology**, 99, 1695-1698.

Cushman JC, Vernon DM, Bohnert HJ (1992) ABA and the Transcriptional Control of CAM Induction during Salt Stress in the Common Ice Plant. In: *Control of Plant Gene Expression*, (D.P. Verma, ed). CRC Press, Boca Raton, FL, pp287-300.

Adams P, Thomas JC, Vernon DM, Bohnert HJ, Jensen RG (1992) Distinct Cellular and Organismic Responses to Salt Stress, **Plant & Cell Physiol**., 33(8), 1215-1223. [>100 citations]

Bohnert HJ, Vernon DM, DeRocher EJ, Michalowski CB, Cushman JC (1992) Biochemistry & Molecular Biology of CAM. In: *Inducible Plant Proteins: Biochemistry & Molecular Biology* (JL Wray, ed) Cambridge Univ Press, Cambridge, UK, pp113-137.

Vernon DM (1992) Molecular Biology of Salinity Tolerance in the Facultative Halophyte *Mesembryanthemum crystallinum*, Ph.D. dissertation, University of Arizona

Ostrem JA, Vernon DM, Bohnert HJ (1990) Increased Expression of a Gene Coding for NAD-GAPdH during the Transition from C3 Photosynthesis to Crassulacean Acid Metabolism in *M. crystallinum.* **Journal of Biological Chemistry**, 265(6), 3497-3502.

Bohnert HJ, OstremJA, Cushman JC, Michalowski CB, Rickers J, Meryer G, DeRocher EJ, Vernon DM, Vasquez-Moreno L, Hoefner R, Schmitt JM (1988) *M. crystallinum*, a Higher Plant Model for the Study of Environmentally Induced Changes in Gene Expression. Plant Molec. Biol. Reporter 6, 10-28.

Vernon DM, Ostrem JA, Schmitt JM, Bohnert HJ (1988) PEPCase Transcript Levels in *M. crystallinum* Decline Rapidly upon Relief from Salt Stress. **Plant Physiology**, 86, 1002-1004.

MEETING PRESENTATIONS & INVITED SEMINARS (*since 2010*)

[* = undergraduate co-authors; **Bold** = invited talk based on abstract submission;
Not included: student presentations at undergraduate research conferences]

Thaman S*, Sheppard BD*, Forsthoefel N, Wilson L*, Doe CQ*, Vernon DM (2021) Pollen-essential LRR gene *PIRL9* is expressed in vascular tissues and its ectopic expression impairs sporophyte development and lateral root initiation, 31st International Conference on Arabidopsis Research. Virtual, June 21-25, 2021

Vernon DM, Knight CR*, Kanagy ME*, Gose MC*, Forsthoefel NR (2019) Moderate heat stress reveals a function for *PIRL7* in Arabidopsis pollen development. Plant Biology 2019 (American Society of Plant Biologists meeting), San Jose, CA August 3-8, 2019

Forsthoefel NR, Foy TE*, Vernon DM (2017) *PIRL6* is Essential Early in Both Male & Female Gametophyte Development. Plant Biology 2017 (ASPB meeting), Honolulu, HI.

Vernon DM, Forsthoefel NR, Klag KA*, Lampron-York A*, Arnold CE*, McNichol SR*, Wood WW* (2016) Regulated alternative splicing contributes to gametophyte-specific expression of Arabidopsis Ras-group LRR gene *PIRL6.* Plant Biology 2016 (ASPB meeting) Austin, TX **[*Invited minisymposium talk*]**

Forsthoefel NR, Klag KA*, Arnold CE*, McNichol SR*, Wood WW* & Vernon DM. (2016) *Arabidopsis* Ras-group LRR PIRL6 functions in both male and female gametophyte development and is regulated by alternative splicing. The 24th International Congress on Plant Reproduction. Tucson, AZ March 2016

Stanton K, Edgert P, Puzey J, Cheng P*, Vernon DM, Forsthoefel N, and Cooley A (2015) A Whole Transcriptome Approach to Identification of Novel Reference Genes for Quantitative Gene Expression Studies in *Mimulus.* Meetings of the Society for Molecular Biology & Evolution, Vienna, July 2015

Forsthoefel NR, Klag KA, Wood WW, McNichol SR, Vernon DM (2015) Arabidopsis PIRL6 encodes a Ras-group LRR protein important for formation of both male and female gametophytes. 26th International Conference on Arabidopsis Research, Paris, France, July 2015

Vernon DM (2015) Arabidopsis *PIRL* genes: functions in plant reproduction and development. Oberlin College, Laskowski Laboratory Group, April 2015

Forsthoefel NR, Gilmore KA*, Hasson A*, Sheppard B & Vernon DM (2014) Overexpression of the pollen-essential *PIRL9* gene stunts plant growth and suggests a function in Arabidopsis sporophyte development, 25th International Conference on Arabidopsis Research (ICAR), Vancouver, B.C., Canada *and* Plant Biology 2014 (ASPB meeting), Portland, OR. July, 2014

Vernon DM, Reiter R*, Reinhart C*, Forsthoefel N (2013) The Arabidopsis *PIRL2, PIRL3, and PIRL9* genes function in the formation and organization of the male germ unit in developing pollen. Plant Biology 2013, Providence, RI, 7/13 **[*Invited minisymposium talk*]**

Forsthoefel NR, Klag KA*, Vernon DM (2013) Alternative splicing, RNA expression, & knockout analysis suggest an essential function for *PIRL6* in Arabidopsis gametophytes. Plant Biology 2013, Providence, RI

Vernon DM, Brougham L*, Reinhart C*, Forsthoefel N (2012) Arabidopsis *PIRL2 & PIRL3* function in pollen differentiation and nuclear organization and interact with the pollen-essential gene *PIRL9,* 23rd International Conference on Arabidopsis Research (ICAR), Vienna, Austria

Forsthoefel N & Vernon DM (2012) The Arabidopsis *PIRL9* gene functions in both the flowering transition and pollen differentiation, 23rd Intl. Conference on Arabidopsis Research (ICAR), Vienna, Austria

Forsthoefel NR, ReinhartCS*, and Vernon DM (2010) *PIRL*s & Pollen: The *PIRL*2 and *PIRL*3 genes function in pollen development and have complex genetic interactions with *PIRL*1 & *PIRL*9. Plant Biology 2010 meetings, Montreal, Canada

SELECTED PRESENTATIONS 1988-2008 (*invited talks only*)

Vernon DM, Davis NA*, Forsthoefel NR (2008) Diverse impacts of *PPR* knockout mutations on *Arabidopsis* embryo morphology, cell organization, and plastid development. Plant Biology 2008 (American Society of Plant Biologists conference), Merida, Mexico. **[*invited minisymposium talk*]**

Forsthoefel N, Dao TP*, Geiser HA, and Vernon DM (2006) The novel intracellular LRR proteins PIRL1 and PIRL9 are required for Arabidopsis pollen development and viability. Plant Biology 2006 meetings, Boston, MA **[*invited minisymposium talk*]**

Vernon DM (2005) Developmental functions and genomic evolution of plant PPR proteins: insights from Arabidopsis knockout mutants. MBBE Department, U. Hawaii-Manoa, HI, June 2005. [invited seminar]

Vernon DM, Anderson TM*, Hutchison D (2004) A role for RNA-mediated gene duplication in the evolution of a huge plant superfamily. Plant Biology 2004 meetings, Orlando, FL ***[invited minisymposium talk]***

Vernon DM, Cushing DA*, Gestaut DR*, Forsthoefel N (2003) Essential roles for PPR proteins in plant development revealed by Arabidopsis knock-out mutants. Plant Biology 2003, Honolulu, HI, July, 2003 ***[invited minisymposium talk]***

Vernon DM, Cushing DA, Gestaut DR, Forsthoefel N (2002) Disruption of a PPR protein in the Arabidopsis *emb*175 mutant. Plant Biology 2002 (ASPB), Denver, CO, August 2002 ***[invited minisymposium talk]***

Vernon DM, Hamilton BG*, Keenan S*, Meinke D (1997) The Arabidopsis *EMB*88 Gene Encodes a Leucine-Rich Repeat Protein Similar to Mammalian RSU-1/RSP-1, 8th International Conference on Arabidopsis Research, Madison, WI **[*invited workshop talk*]**

Vernon DM (1992) Osmoprotection in a Facultative Halophyte: Transcriptional Activation of an Inositol O-Methyl Transferase in Adaptation to Salt Stress, Am. Soc. Plant Physiol (ASPP) meetings, Pittsburgh, PA ***[invited minisymposium talk]***

Vernon DM (1991) A Methyl Transferase Induced by Salt Stress in the Facultative Halophyte *M. crystallinum,* Intl. Society for Plant Molecular Biology, 3rd Intl. Congress, Tucson, AZ, October, 1991 ***[invited talk]***

Vernon DM (1991) The Regulation of Genes Involved in Salt Tolerance and CAM Induction in *Mesembryanthemum crystallinum*: A Complex Web of Molecular Responses to Environmental Stimuli, ASPP meetings, Albuquerque, NM ***[invited minisymposium talk]***

TEACHING EXPERIENCE

WHITMAN COLLEGE, WALLA WALLA, WA, 1995-PRESENT:

GENE DISCOVERY & FUNCTIONAL GENOMICS, BIO 342: Reading and discussion of primary research literature, focused on gene identification by mRNA- and protein-based strategies, positional cloning, WGAS, database mining, and functional analysis by reverse genetics and transcriptomics.

MOLECULAR BIOLOGY, BBMB 326: Advanced class covering molecular biology and genomics; emphasis on gene expression and regulatory mechanisms and aspects of genome evolution. Required for Whitman BBMB majors, elective for Biology and other majors.

MOLECULAR BIOLOGY LABORATORY, BBMB 336: Lab course in molecular methods such as *E. coli* transformation, plasmid characterization, PCR, mRNA expression analysis, and genome database mining. Required for BBMB majors; elective for Biology and other pre-health professions majors.

BIOCHEMISTRY, BIOPHYSICS, & MOLECULAR BIOLOGY SEMINAR, BBMB 400: Capstone seminar for the BBMB major; presentation & discussion of research literature and student thesis research.

GENETICS 205: Covers both molecular and Mendelian genetics and aspects of genomics. This is a large class required for Biology and BBMB majors and taken by many psychology students, and numerous pre-health careers students from diverse majors.

THE HUMAN GENOME, BIO 140: A non-majors class covering the structure, content, and function of the human genome, with discussion of topics such as Mendelian inheritance, epigenetics, stem cells, and evolution.

STUDENT RESEARCH/THESIS 490: Supervision of research projects and senior thesis and seminar preparation for my lab students and others who did research at other institutions. >70 undergrads have worked in my lab since 1996, many with externally-funded summer research support.

GENES & GENETIC ENGINEERING, BIO 125: Non-majors' class on genetics, related technologies & controversies

GENETICS LABORATORY 206: Required for Biology majors; included Mendelian and molecular genetic projects and use of genome sequence databases. [Taught 2001-2012; 2023-]

DEVELOPMENTAL BIOLOGY 329: Upper-level elective emphasizing developmental mechanisms in animal systems at the cellular and genetic levels. Included lecture and laboratory. [Taught 1995-2000]

BIOLOGICAL PRINCIPLES 111 LAB: Laboratory of introductory biology course, covering principles of molecular, cellular, and organismal biology [taught 1996, 1997]

OTHER LECTURES AND COURSES:

2 invited lectures, graduate Plant Development course, Plant Sciences Dept, Univ. of Arizona, Nov. 1999

Invited Lecture/Seminar, "Arabidopsis as a Model System for the Study of Plant Development", Undergraduate Genetics class (Bio 306), Biology Department, University of Michigan at Dearborn, 1994

Invited Lecture in graduate course, "Molecular Biology of Plant Environmental Stress", Department of Biochemistry, Oklahoma State University, 1993

Graduate Teaching Assistant, undergraduate introductory biology (Bio 181), Department of Molecular and Cellular Biology, University of Arizona, 1987.

Teaching Assistant, non-majors Human Biology, & majors' Introductory Biology Laboratories, Biology Dept, Oberlin College, 1985, 1986. Labs included detailed fetal pig dissection, plus microscopy.

Oberlin College Experimental College class: "Introduction to Freshwater Fishing". I designed, organized, and co-taught this 1-credit course offered for credit through Oberlin's "EXCO" program. Spring, 1986

RESEARCH MENTORING, 2010-2021

[*I've supervised >70 undergraduate research students in my lab at Whitman College. Only students who did thesis work in my laboratory since 2010 are listed here, with short descriptions of their projects.*]

- Zach Tsubota (2021-22) RT-PCR to investigate possible role for PIRL9 in plant immunity
- Callie Martin (2021) Arabidopsis PIRL9 gene expression in embryogenesis; PR-1 mRNA expression.
- Swaraj Thaman (2020-21) Reporter gene study of PIRL9 gene expression during sporophyte development
- Rudo Ndamba (2019-20): Functional analysis of Arabidopsis PIRL3 gene using knockout (KO) mutants
- Molly Kanagy (2019-20): Abnormal cell architecture in pollen produced by Arabidopsis pirl7 KO mutants
- Casey Doe (2019-20): Patterns of PIRL9 gene expression during Arabidopsis root development
- Noah Wechter (2018-19): SEM and light microscopy of heat stressed pollen from pirl9 and pirl3 mutants
- Lauren Wilson (2017; 2018-19): Reporter gene constructs for gene expression analysis in transgenic plants
- Chanel Knight (2017-18): Confocal and light microscopy of heat stressed Arabidopsis pirl7 mutant pollen
- Beatitude Steffen (2017-18): Confocal microscopy of pollen produced by pirl3 gene knockout mutants
- Maggie Gose (2016-17): Characterization of pollen produced pirl7 knockout mutants,
- Trayvon Foy (2016-17): Microscopy of female gametophyte development after PIRL6 RNAi knockdown
- Amelia Lampron-York (2015-16): PIRL6 mRNA expression in nonsense-mediated decay pathway mutants
- Ben Sheppard (2014-16): Developmental phenotype of transgenic plants over-expressing the PIRL9 gene

- Savannah McNichol (2014-16): Abnormal pollen development w/ RNAi-induced knockdown of PIRL6
- Claire Arnold (2014-16): Effects on ovule viability of RNAi-induced reduced expression of the PIRL6 gene
- Whitney Wood (2014-15): Investigating PIRL6 gene expression using GFP and RT-PCR
- Alexandre Germanos (2014-15): Determining 35S-PIRL9 transgene copy number using genomic qPCR
- Jack Armitage (2014-15): PIRL9 gene knockdown by RNAi, in a pirl1 mutant background
- Hallie Swan (2013-14): PIRL1-GFP protein localization by transient expression in leaf protoplasts
- Liz Leong (2013-14): Expression of the PIRL9 gene in pollen and in root primary and lateral meristems
- Geneva Scharff (2012-2013): PIRL9 mRNA expression in plants containing an inducible RNAi construct
- Rachel Reiter (2012-13): Confocal microscopy of disorganized nucleus configurations in pirl mutant pollen
- Ashley Ehlers (2012-2013): Generating gene constructs for investigating PIRL gene function & expression.
- Kendall Gilmore (2012-14): ID-ing transgenic plants harboring a 35S-PIRL9 gene over-expression construct
- Kendra Klag (2011-2013): Producing gene constructs and transgenic lines for RNAi knockdown of PIRL6
- Amy Hasson (2011-12): Gene constructs to ectopically overexpress the PIRL9 gene in transgenic plants
- Lauren Broughm (2011-12): Studies of flowering time in Arabidopsis *pirl* knockout mutants
- Sebastian Elstrott (2011-12): RNAi silencing of the Arabidopsis *PIRL9* gene in a *pirl1* mutant background.
- Laura Lee Woods (2010-11): Gene interactions between *PIRL9* and known regulators of flowering time
- Carrie Reinhart (2010-11): *PIRL* gene interactions and redundancy in Arabidopsis pollen development