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Education

Ph.D., December 1989, Purdue University (Botany & Plant Pathology)
B.S., *cum laude*, May 1985, University of Massachusetts at Amherst (Plant Pathology)

Professional Experience

1/12 – present, Davis-Michael Professor of Plant and Soil Sciences
(7/92 – 8/98, Asst. Prof.; 8/98 – 8/05, Assoc. Prof.; 8/05 – present, Professor of Mycology)
West Virginia University, Division of Plant & Soil Sciences, Morgantown, WV
Biochemical and molecular genetics of pathogenic and mutualistic fungi

1/2002 – 6/2002, Professional Development Leave, host: Dr. Brian Tapper, AgResearch NZ,
Palmerston North, New Zealand; Chemical analyses of altered ergot alkaloid pathways

1/90 – 7/92, Visiting Research Associate, Laboratory of Dr. Jonathan Walton
Michigan State University - DOE Plant Research Laboratory, East Lansing, MI
Biochemical and molecular genetics of toxin biosynthesis in *Cochliobolus* spp.

8/85 – 12/89, Graduate Research Assistant, Laboratory of Dr. Robert Hanau
Purdue University, Department of Botany and Plant Pathology, West Lafayette, IN
Molecular genetics of conidial development in *Colletotrichum graminicola*

5/85 – 8/85, Research Technician, Laboratory of Dr. Stan Kostka
Crop Genetics International, Dorsey, MD
Use of endophytic bacteria as potential biological control agents

5/84 – 9/84, Undergraduate Assistant, Laboratory of Dr. William Manning
University of Massachusetts, Department of Plant Pathology, Amherst, MA
Isolation and identification of fungi associated with black root rot of strawberry

1/84 – 5/85, Undergraduate Researcher, Laboratory of Dr. George Agrios
University of Massachusetts, Department of Plant Pathology, Amherst, MA
Virus titer in anther-derived haploid versus diploid tobacco plants

Awards and Honors

Davis Michael Professor of Plant and Soil Sciences, 2012 – present
Senior Faculty Award of Merit, Gamma Sigma Delta, 2009
Outstanding Researcher, Davis College of Agriculture, Forestry & Consumer Science, 2004
Junior Faculty Award of Merit, Gamma Sigma Delta, 1997
Outstanding Researcher, College of Agriculture & Forestry, 1996-97
Outstanding Teacher, Division of Plant & Soil Sciences, 1996-97
DowElanco Graduate Scholarship Award, 1989
Purdue University Department of Botany and Plant Pathology DuPont Award, 1988-89

PUBLICATIONS

Refereed Journal Articles

- Panaccione, D.G. and Arnold, S.L. 2017. Ergot alkaloids contribute to virulence in an insect model of invasive aspergillosis. *Scientific Reports* 7:8390.
- Arnold, S.L. and Panaccione, D.G. 2017. Biosynthesis of the pharmaceutically important fungal ergot alkaloid dihydrolysergic acid requires a specialized allele of *cloA*. *Applied and Environmental Microbiology* 83:e00805-17.
- Florea, S., Panaccione, D.G. and Schardl, C.L. 2017. Ergot alkaloids of the Clavicipitaceae. *Phytopathology* 107:504-518.
- Bilovol, Y., and Panaccione, D.G. 2016. Functional analysis of the gene controlling hydroxylation of festuclavine in the ergot alkaloid pathway of *Neosartorya fumigata*. *Current Genetics* 62:853-860.
- Florea, S., Phillips, T.D., Panaccione, D.G., Farman, M.L., and Schardl, C.L. 2016. Chromosome-end knockoff strategy to reshape alkaloid profiles of a fungal endophyte. *G3 Genes Genomes Genetics* 6:2601-2610.
- Mulinti, P., Florea, S., Schardl, C.L., and Panaccione, D.G. 2016. Modulation of ergot alkaloids in a grass-endophyte symbiosis by alteration of mRNA concentrations of an ergot alkaloid synthesis gene. *Journal of Agricultural and Food Chemistry* 64:4982-4989.
- Robinson, S.L., and Panaccione, D.G. 2015. Diversification of ergot alkaloids in natural and modified fungi. *Toxins* 7:201-218.
- Ryan, K.L., Akhmedov, N.G., and Panaccione, D.G. 2015. Identification and structural elucidation of ergotryptamine, a new ergot alkaloid produced by genetically modified *Aspergillus nidulans* and natural isolates of *Epichloë* species. *Journal of Agricultural and Food Chemistry* 63:61-67.
- Beaulieu, W.T., Panaccione, D.G., Ryan K.L., Kaonongbua, W., and Clay, K. 2015. Phylogenetic and chemotypic diversity of *Periglandula* species in eight new morning glory hosts (Convolvulaceae). *Mycologia* 107:667-678.
- Young, C.A., Schardl, C.L., Panaccione, D.G., Florea, S., Takach, J.E., Charlton, N.D., Moore, N., Webb, J.S, and Jaromczyk, J. 2015. Genetics, genomics and evolution of ergot alkaloid diversity. *Toxins* 7:1273-1302.
- Gingerich, R.T., Panaccione, D.G., and Anderson, J.T. 2015. The role of fungi and invertebrates in litter decomposition in mitigated and reference wetlands. *Limnologia* 54:23-32.
- Robinson, S.L., and Panaccione, D.G. 2014. Heterologous expression of lysergic acid and novel ergot alkaloids in *Aspergillus fumigatus*. *Applied and Environmental Microbiology* 80:6465-6472.

PUBLICATIONS

Refereed Journal Articles (continued)

Morton, J.B., Benedito, V.A., Panaccione, D.G., and Jenks, M.A. 2014. Potential for industrial application of microbes in symbioses that influence plant productivity and sustainability in agricultural, natural or restored ecosystems. *Industrial Biotechnology* 10:347-353.

Panaccione, D.G., Beaulieu, W.T., and Cook, D. 2014. Bioactive alkaloids in vertically transmitted fungal endophytes. *Functional Ecology* 28:299-314.

Mulinti, P., Allen, N.A., Coyle, C.M., Gravelat, F.N., Sheppard, D.C., and Panaccione, D.G. 2014. Accumulation of ergot alkaloids during conidiophore development in *Aspergillus fumigatus*. *Current Microbiology* 68:1-5.

Ryan, K.L., Moore, C.T., and Panaccione, D.G. 2013. Partial reconstruction of the ergot alkaloid pathway by heterologous gene expression in *Aspergillus nidulans*. *Toxins* 5:445-455.

Beaulieu, W.T., Panaccione, D.G., Hazekamp, C.S., McKee, M.C., Ryan, K.L., and Clay, K. 2013. Differential allocation of seed-borne ergot alkaloids during early ontogeny of morning glories (Convolvulaceae). *Journal of Chemical Ecology* 39:919-930.

Schardl, C.L., Young, C.A., Pan, J., Florea, S., Takach, J.E., Panaccione, D.G., Farman, M.L., Webb, J.S., Jaromczyk, J., Charlton, N.D., Nagabhyru, P., Chen, L., Shi, C., and Leuchtman, A. 2013. Currencies of mutualisms: Sources of alkaloid genes in vertically transmitted epichloae. *Toxins* 5:1064-1088.

Schardl, C.L., Young, C.A., Hesse, U., Amyotte, S.G., Andreeva, K., Calie, P.J., Fleetwood, D.J., Haws, D.C., Moore, N., Oeser, B., Panaccione, D.G., et al. 2013. Plant-symbiotic fungi as chemical engineers: multi-genome analysis of the Clavicipitaceae reveals dynamics of alkaloid loci. *PLoS Genetics* 9:e1003323 (26 pages).

Robinson, S.L., and Panaccione, D.G. 2012. Chemotypic and genotypic diversity in the ergot alkaloid pathway of *Aspergillus fumigatus*. *Mycologia* 104:804-812.

O'Connell, R.J., and 62 others (Panaccione, D.G. listed 35th alphabetically). 2012. Life-style transitions in plant pathogenic *Colletotrichum* fungi defined by genome and transcriptome analyses. *Nature Genetics* 44:1060-1065.

Goetz, K.E., Coyle, C.M., Cheng, J.Z., O'Connor, S.E., and Panaccione, D.G. 2011. Ergot cluster-encoded catalase is required for synthesis of chanoclavine-I in *Aspergillus fumigatus*. *Current Genetics* 57:201-211.

Cheng, J.Z., Coyle, C.M., Panaccione, D.G., and O'Connor, S.E. 2010. Controlling a structural branch point in ergot alkaloid biosynthesis. *Journal of the American Chemical Society* 132:12835-12837.

PUBLICATIONS

Refereed Journal Articles (continued)

Coyle, C.M., Cheng, J.Z., O'Connor, S.E., Panaccione, D.G. 2010. An old yellow enzyme gene controls the branch point between *Aspergillus fumigatus* and *Claviceps purpurea* ergot alkaloid pathways. *Applied and Environmental Microbiology* 76:3898-3903

Cheng, J.Z., Coyle, C.M., Panaccione, D.G., and O'Connor, S.E. 2010. A role for old yellow enzyme in ergot alkaloid biosynthesis. *Journal of the American Chemical Society* 132:1776-1777.

Hopkins, A.A., Young, C.A., Panaccione, D. G., Simpson, W.R., Mittal, S., and Bouton, J.H. 2010. Agronomic performance and lamb health among several tall fescue novel endophyte combinations in the south central USA. *Crop Science* 50:1552-1561.

Liu, M., Panaccione, D.G., and Schardl, C.L. 2009. Phylogenetic analyses reveal monophyletic origin of the ergot alkaloid gene *dmaW* in fungi. *Evolutionary Bioinformatics* 5:1-17.

Potter, D.A., Stokes, J.T., Redmond, C.T., Schardl, C.L., and Panaccione, D.G. 2008. Contribution of ergot alkaloids to suppression of a grass-feeding caterpillar assessed with gene-knockout endophytes in perennial ryegrass. *Entomologia Experimentalis et Applicata* 126:138-147.

Coyle, C.M., Kenaley, S.C., Rittenour, W.R., and Panaccione, D.G. 2007. Association of ergot alkaloids with conidiation in *Aspergillus fumigatus*. *Mycologia* 99:804-811.

Panaccione, D.G., Kotcon, J.B., Schardl, C.L., Johnson, R.J., and Morton, J.B. 2006. Ergot alkaloids are not essential for endophytic fungus-associated population suppression of the lesion nematode, *Pratylenchus scribneri*, on perennial ryegrass. *Nematology* 8:583-590.

Panaccione, D.G., Cipoletti, J.R., Sedlock, A.B., Blemings, K.P., Schardl, C.L., Machado, C., and Seidel, G.E. 2006. Effects of ergot alkaloids on food preference and satiety in rabbits, as assessed with gene knockout endophytes in perennial ryegrass (*Lolium perenne*). *Journal of Agricultural and Food Chemistry* 54:4582-4587.

Panaccione, D.G. 2005. Origins and significance of ergot alkaloid diversity in fungi. *FEMS Microbiology Letters* 251:9-17.

Panaccione, D.G., and Coyle, C.M. 2005. Abundant respirable ergot alkaloids from the common airborne fungus *Aspergillus fumigatus*. *Applied and Environmental Microbiology* 71:3106-3111.

Coyle, C.M., and Panaccione, D.G. 2005. An ergot alkaloid biosynthesis gene and clustered hypothetical genes from *Aspergillus fumigatus*. *Applied and Environmental Microbiology* 71:3112-3118.

PUBLICATIONS

Refereed Journal Articles (continued)

- Damrongkool, P., Sedlock, A.B., Young, C.A., Johnson, R.D., Goetz, K.E., Scott, B., Schardl, C.L., and Panaccione, D.G. 2005. Structural analysis of a peptide synthetase gene required for ergopeptine production in the endophytic fungus *Neotyphodium lolii*. *DNA Sequence* 16:379-385.
- Haarmann, T., Machado, C., Lübbe, Y., Correia, T., Schardl, C.L., Panaccione, D.G., and Tudzynski, P. 2005. The ergot alkaloid gene cluster in *Claviceps purpurea*: extension of the cluster sequence and intra species evolution. *Phytochemistry* 66:1312-1320.
- Wang, J., Machado, C., Panaccione, D.G., Tsai, H.-F., and Schardl, C.L. 2004. The determinant step in ergot alkaloid biosynthesis by an endophyte of perennial ryegrass. *Fungal Genetics & Biology* 41:189-198.
- Johnson, L.J., Johnson, R.D., Schardl, C.L., and Panaccione, D.G. 2003. Identification of differentially expressed genes in the mutualistic association of tall fescue with *Neotyphodium coenophialum*. *Physiological and Molecular Plant Pathology* 63:305-317.
- Panaccione, D.G., Tapper, B.A., Lane, G.A., Davies, E., and Fraser, K. 2003. Biochemical outcome of blocking the ergot alkaloid pathway of a grass endophyte. *Journal of Agricultural and Food Chemistry* 51:6429-6437.
- Panaccione, D.G., Johnson, R.D., Wang, J., Young, C.A., Damrongkool, P., Scott, B. and Schardl, C.L. 2001. Elimination of ergovaline from a grass-*Neotyphodium* endophyte symbiosis by genetic modification of the endophyte. *Proceedings of the National Academy of Science, USA* 98:12820-12825.
- Panaccione, D.G., Sheets, N.L., Miller, S.P., and Cumming, J.R. 2001. Diversity of *Cenococcum geophilum* populations from serpentine and non-serpentine soil. *Mycologia* 93:645-652.
- De Fede, K.L., Panaccione, D.G., and Sexstone, A.J. 2001. Characterization of dilution enrichment cultures obtained from size-fractionated soil bacteria by BIOLOG substrate utilization patterns and restriction analysis of 16S rRNA genes. *Soil Biology and Biochemistry* 33:1555-1562.
- Cumming, J.R., Swiger, T.D., Kurnik, B.S., and Panaccione, D.G. 2001. Organic acid exudation by *Laccaria bicolor* and *Pisolithus tinctorius* exposed to aluminum *in vitro*. *Canadian Journal of Forest Research* 31:703-710.
- Annis, S.L., and Panaccione, D.G. 1998. Presence of peptide synthetase gene transcripts and accumulation of ergopeptines in *Claviceps purpurea* and *Neotyphodium coenophialum*. *Canadian Journal of Microbiology* 44:80-86.
- Zhang, S., Panaccione, D.G., and Gallegly, M.E. 1997. Metalaxyl stimulation of growth of isolates of *Phytophthora infestans*. *Mycologia* 89:289-292.

PUBLICATIONS

Refereed Journal Articles (continued)

Panaccione, D.G. 1996. Multiple families of peptide synthetase genes from ergopeptide-producing fungi. *Mycological Research* 100:429-436.

Panaccione, D.G., Pitkin, J.W., Walton, J.D., and Annis, S.L. 1996. Transposon-like sequences at the *TOX2* locus of the plant-pathogenic fungus *Cochliobolus carbonum*. *Gene* 176:103-109.

Pitkin, J.W., Panaccione, D.G., and Walton, J.D. 1996. A putative cyclic peptide efflux pump encoded by the *TOXA* gene of the plant pathogenic fungus *Cochliobolus carbonum*. *Microbiology* 142:1557-1565.

Nikolskaya, A.N., Panaccione, D.G., and Walton, J.D. 1995. Identification of peptide synthetase-encoding genes from filamentous fungi producing host-selective phytotoxins or analogs. *Gene* 165:207-211.

Panaccione, D.G. 1993. The fungal genus *Cochliobolus* and toxin-mediated plant disease. *Trends in Microbiology* 1:14-20.

Apel, P.A., Panaccione, D.G., Holden, F.R., and Walton, J.D. 1993. Cloning and targeted gene disruption of *XYL1*, a β 1,4-xylanase gene from the maize pathogen *Cochliobolus carbonum*. *Molecular Plant-Microbe Interactions* 6:467-473.

Panaccione, D.G., Scott-Craig, J.S., Pocard, J.-A., and Walton, J.D. 1992. A cyclic peptide synthetase gene required for pathogenicity of the fungus *Cochliobolus carbonum* on maize. *Proceedings of the National Academy of Science, USA* 89:6590-6594.

Scott-Craig, J.S., Panaccione, D.G., Pocard, J.-A., and Walton, J.D. 1992. The cyclic peptide synthetase catalyzing HC-toxin production in the filamentous fungus *Cochliobolus carbonum* is encoded by a 15.7-kb open reading frame. *Journal of Biological Chemistry* 267:26044-26049.

Rasmussen, J.B., Panaccione, D.G., Fang, G.-C, and Hanau, R.M. 1992. The *PYR1* gene of the plant pathogenic fungus *Colletotrichum graminicola*: selection by intraspecific complementation and sequence analysis. *Molecular and General Genetics* 235:74-80.

Yang, Z., Panaccione, D.G., and Hanau, R.M. 1991. Gene expression associated with light-induced conidiation in *Colletotrichum graminicola*. *Canadian Journal of Microbiology* 37:165-167.

Panaccione, D.G., and Hanau, R.M. 1990. Characterization of two divergent β -tubulin genes from *Colletotrichum graminicola*. *Gene* 86:163-170.

Scott-Craig, J.S., Panaccione, D.G., Cervone, F., and Walton, J.D. 1990. Endopolygalacturonase is not required for pathogenicity of *Cochliobolus carbonum* on maize. *The Plant Cell* 2:1191-1200.

PUBLICATIONS

Refereed Journal Articles (continued)

Panaccione, D.G., Vaillancourt, L.J., and Hanau, R.M. 1989. Conidial dimorphism in *Colletotrichum graminicola*. *Mycologia* 81:876-883.

Panaccione, D.G., McKiernan, M., and Hanau, R.M. 1988. *Colletotrichum graminicola* transformed with homologous and heterologous benomyl resistance genes retains expected pathogenicity to corn. *Molecular Plant-Microbe Interactions* 1:113-120.

Patents

Panaccione, DG, Robinson, SL. 2015. Production of lysergic acid by genetic modification of a fungus. U.S. Patent No. 20,150,361,471. 17 Dec. 2015.

Other Invited Reviews and Book Chapters

Panaccione, D.G., Ryan, K.L., Schardl, C.L., and Florea, S. 2012. Analysis and modification of ergot alkaloid profiles in fungi. *Methods in Enzymology* 515:267-290.

Panaccione, D.G., Coyle, C.M., Schardl, C.L., Cheng, J.Z., and O'Connor, S.E. 2012. Early steps and branch point of ergot alkaloid pathways in fungi. In *Epichloae: Implications, Utilization and Biology as Endophytes of Cool Season Grasses*, Schardl, C.L., and Young, C.A. (Eds.), The Samuel Noble Roberts Foundation, Ardmore, OK, pp. 131-135.

Panaccione, D.G. 2010. Ergot alkaloids. In *The Mycota, Vol. 10, Industrial Applications*, 2nd Edition, Hofrichter, M. (Ed.). Springer-Verlag, Berlin-Heidelberg, pp. 195-214.

Schardl, C.L., Panaccione, D.G., and Tudzynski, P. 2006. Ergot alkaloids — Biology and Molecular Biology. In *The Alkaloids: Chemistry and Biology*, Vol. 62, Cordell, G.A. (Ed.). Academic Press, San Diego, CA, pp. 45-86.

Panaccione, D.G., Schardl, C.L., and Coyle, C.M. 2006. Pathways to diverse ergot alkaloid profiles in fungi. In *Recent Advances in Phytochemistry*, Vol. 40, Romeo, J.T. (Ed.). Elsevier, Amsterdam, pp. 23-52.

Schardl, C.L., and Panaccione, D.G. 2005. Biosynthesis of ergot and loline alkaloids. In *Neotyphodium in Cool-Season Grasses*, Roberts, C.A., West, C.P., and Spiers, D.E. (Eds.). Blackwell Publishing, Ames, IA, USA, pp. 75-92.

Walton, J.D., Panaccione, D.G., and Hallen, H. 2004. Peptide synthesis without ribosomes. In *Advances in Fungal Biotechnology for Industry, Agriculture, and Medicine*, Tkacz, J., and Lange, L. (Eds.). Kluwer Academic/Plenum Publishers, NY, pp. 127-162.

Panaccione, D.G., and Schardl, C.L. 2003. Molecular genetics of ergot alkaloid biosynthesis. In *The Clavicipitalean Fungi: Evolutionary Biology, Chemistry, Biocontrol, and Cultural Impacts*, White, J.F., Jr., Bacon, C.W., Hywel-Jones, N.L., and Spatafora, J.W. (Eds.). Marcel-Dekker, NY, pp. 399-424.

PUBLICATIONS

Other Invited Reviews and Book Chapters (continued)

Panaccione, D.G., Johnson, R.D., Rasmussen, J.B., and Friesen, T.L. 2002. Fungal phytotoxins. In *The Mycota, Vol. XI, Agricultural Applications*, Kempken, F. (Ed.). Springer-Verlag, Berlin-Heidelberg, pp. 311-340.

Panaccione, D.G., and Annis, S.L. 2001. Significance of fungal peptide secondary metabolites in the agri-food industry. In *Applied Biology and Biotechnology: Food and Fungi*, Vol. I., Khachatourians, G.G., and Arora, D.K. (Eds.). Elsevier, The Netherlands, pp. 115-143.

Panaccione, D.G. 1998. Ergopeptine toxins and peptide synthetase genes in clavicipitaceous pathogens and symbionts of plants. In *Molecular Genetics of Host-Specific Toxins in Plant Disease*, Kohmoto, K., and Yoder, O.C. (Eds.). Kluwer, The Netherlands, pp. 199-209.

Walton, J.D., Bronson, C.R., Panaccione, D.G., Braun, E., and Akimitsu, K. 1995. *Cochliobolus*. In *Pathogenesis and Host Specificity in Plant Diseases*, Vol. II, Kohmoto, K., Singh, U.S., and Singh, R.P. (Eds.). Pergamon, New York, pp. 65-81.

Walton, J.D., and Panaccione, D.G. 1993. Host-selective toxins and disease specificity: perspectives and progress. *Annual Review of Phytopathology* 31:275-303.

Walton, J.D., Panaccione, D.G., and Scott-Craig, J.S. 1991. Biochemical genetics of host-selective toxin biosynthesis in *Cochliobolus carbonum*. In *The Dynamics of Recognition in Interactions of Organisms*. Kunoh, H. (Ed.). The Phytopathological Society of Japan, pp. 86-92.

Refereed Book Review in Journal

Panaccione, D.G. 2006. "Handbook of Industrial Mycology", by An, Z. (Ed) (Marcel Dekker, 2005). *Mycopathologia* 161:403-404.

INVITED PRESENTATIONS

28 November 2016, Frontera University International Symposium, Pucon, Chile
"Bioprotective roles of ergot alkaloids from fungi"

24 November 2011, New Zealand Microbiological Society Annual Conference, Palmerston North, New Zealand
"Genetic and biochemical bases for ergot alkaloid diversification in fungi"

5 November 2010, Department of Microbiology and Immunology, Robert C. Byrd Health Sciences Center, West Virginia University
"Biosynthesis and significance of ergot alkaloids in fungi"

1 July 2010, Mycological Society of America/International Symposium on Fungal Endophytes of Grasses, Lexington, KY
"Early steps and branch point of ergot alkaloid pathways in fungi"

24 September 2008, World Congress on Allelopathy, Saratoga Springs, NY
"Bioprotective functions of ergot alkaloids in an endophytic fungus-grass symbiosis"

1 July 2008, SURE program, West Virginia University
"Biosynthesis and significance of toxic ergot alkaloids in fungi"

16 April 2008, USDA NRI meeting on Genes to Products, Bethesda, MD
"Toxin biosynthesis genes in ergot alkaloid-producing fungi"

25 April 2007, Noble Foundation, Ardmore, OK
"Biosynthesis and significance of ergot alkaloids in fungi"

16 February 2006, University of Kentucky, Lexington, Department of Plant Pathology
"Origins and significance of ergot alkaloid diversity in fungi"

3 August 2005, Annual Meeting of the Phytochemical Society of North America, La Jolla, CA
"Origins and significance of ergot alkaloid diversity in fungi"

27 February 2004, Slippery Rock University, Slippery Rock, PA, Department of Biology
"Toxic ergot alkaloids from fungi: from witch trials, to animal feed, to the air we breathe"

22 September 2003, Biology Department (Student-selected Speaker), West Virginia University
"Biosynthesis and significance of toxic ergot alkaloids in fungal symbionts of grasses"

22 August 2003, Fourth International Symbiosis Society Congress, Halifax, Nova Scotia
"Biosynthesis and significance of ergot alkaloids in a grass-endophyte symbiosis"

20 March 2003, Fungal Genetics Conference, Asilomar, CA
"Genetic modification of the ergot alkaloid profile of a grass endophyte"

7 November 2002, University of Kentucky, Lexington, Department of Plant Pathology
"Genetic modification of ergot alkaloid profiles in endophytes"

23 September 2002, Penn State University, University Park, Department of Plant Pathology
"Genetic modification of ergot alkaloid profiles in grass endophytes"

INVITED PRESENTATIONS

(continued)

10 June 2002, Massey University, Palmerston North, New Zealand, Institute of Molecular BioSciences, "Genetic manipulation of ergot alkaloid profiles in endophytes of grasses"

15 April 2002, AgResearch Grasslands Research Institute, Palmerston North, New Zealand, "Modification of ergot alkaloid profiles in endophytes by gene knockout"

13 August 2000, Annual Meeting of the American Phytopathological Society, New Orleans, LA "Ergopeptines and peptide synthetase genes in pathogens and endophytes in the Clavicipitaceae"

30 March 1998, Department of Microbiology and Immunology, Robert C. Byrd Health Sciences Center of West Virginia University, Morgantown
"Molecular genetics of fungal peptide toxin biosynthesis"

1 September 1997, Kagawa University, Kagawa, Japan
"Ergopeptine toxins and peptide synthetase genes in clavicipitaceous pathogens and symbionts of plants"

29 August 1997, The Third International Symposium on Host-Specific Toxins, Tottori, Japan, "Ergopeptine toxins and peptide synthetase genes in clavicipitaceous pathogens and symbionts of plants"

28 April 1997, University of Kentucky, Lexington, Department of Plant Pathology
"Biosynthesis and significance of fungal peptide toxins"

21 February 1997, Rutgers University, New Brunswick, NJ, Plant Biology Program
"Peptide synthetase genes and toxin biosynthesis in plant-associated fungi"

8 December 1995, North Dakota State University, Fargo, Department of Biochemistry
"The making and breaking of ergopeptines"

7 December 1994, Cell and Molecular Biology Seminar Series, Robert C. Byrd Health Sciences Center of West Virginia University, Morgantown
"Molecular genetics of peptide toxin biosynthesis in plant-associated fungi 16 November 1993,

Fairmont State College, Fairmont, WV
"Genetic engineering of fungi: principles and applications"

25 March 1993, The 50th Annual Meeting of the Potomac Division of the American Phytopathological Society, St. Michaels, MD
"Molecular basis of pathogenicity in *Helminthosporium* leaf spot of maize"

24 July 1992, Gordon Conference on Fungal Metabolism, Andover, NH
"A complex locus required for toxin production and pathogenicity of *Cochliobolus carbonum* on maize"

GRANTS

Active External Grants

Panaccione, D.G. Strategic reprogramming of the ergot alkaloid pathway. NIH NIGMS. \$332,945 (4/15 – 3/18).

Completed External Grants

Panaccione, D.G., and Schardl, C.L. Alteration of alkaloid profiles of forage and turf grasses by genetic manipulation of endophytic fungi. USDA NIFA AFRI Foundational. \$500,000 (4/12 – 3/16).

Panaccione, D.G., and Schardl, C.L. Biochemical and genetic basis for ergot alkaloid diversification. USDA NRI Plant Biology (c) Biochemistry. \$394,989 (9/08 – 8/12).

Panaccione, D.G., and Schardl, C.L. Toxin biosynthesis genes in ergot alkaloid-producing fungi. USDA NRI Agricultural Plant Biochemistry. \$358,000 (9/05 – 8/09).

Panaccione, D.G. Subcontract to Deletion of ergot alkaloid production genes in a tall fescue endophyte. USDA CSREES via Univ. of Kentucky Research Foundation. \$43,599 (4/04 – 4/07)

Panaccione, D.G., and Schardl, C.L. Toxin biosynthesis genes in ergopeptine-producing fungi. USDA NRICGP Biology of Plant-Microbe Interactions. \$470,000 (11/98 – 8/05; included competitive renewal).

Cumming, J.R., and Panaccione D.G. Ecotypic variation in ectomycorrhizae from serpentine soils. USDA NRICGP Soil Biology. \$190,000 (9/97 – 8/01)

Cumming, J.R., Panaccione D.G., Morton, J.B., and Skousen, J.G. Adaptive mechanisms of aluminum tolerance in ectomycorrhizal fungi. NSF Ecology and Evolutionary Physiology. \$327,470 (9/97 – 8/01)

Panaccione, D.G. Peptide synthetase genes from ergopeptine-producing fungi. USDA NRICGP Plant Pathology. \$225,000 (9/93 – 8/98; included competitive renewal)

Panaccione, D.G. Potential for increased variability in the late blight fungus and other pathogens due to metalaxyl. Northeast Pesticide Impact Assessment Program of USDA CSREES. \$23,424 (4/93 – 9/95; included competitive renewal)

Equipment Grants

Blemings, K.P., Verlinden, S., Killefer, J., and Panaccione, D. Acquisition of a real-time PCR instrument. WVU Research Corporation Investment in Research Stimulation. \$55,995 (2002)

Cumming, J.R. and Panaccione, D.G. Acquisition of a Waters HPLC for support of fungal biology research. USDA NRICGP Strengthening Program. \$30,021 (9/99 – 9/00)

GRANTS

Completed Internal Grants

WV Agriculture & Forestry Experiment Station, Competitive Summer Grants.

Feedback inhibition of the ergot alkaloid pathway of a grass endophyte. \$5,000 (2001)

Strategies to expedite analyses of a peptide synthetase gene associated with the production of ergovaline in agriculturally important fungi. \$3,982 (2000)

West Virginia University Faculty Senate Research Program.

Effect of an endophytic fungus on a plant's defense response. \$7,000 (7/97 – 6/98).

Genetic manipulation of *Acremonium coenophialum*. \$8,810 (7/93 – 6/94).

Current Hatch Project

Panaccione, D.G. Genetic modification of ergot alkaloid profiles in agriculturally important fungi (2/26/14 – 1/31/19).

TEACHING

Courses Taught

Applied and Environmental Microbiology Current Concepts in Microbial Ecology
1 credit, Spring semester 2017

Genetics 521 Basic Concepts of Modern Genetics, 3 credits, Fall semesters since 1993

Plant Pathology 503 Mycology, 4 credits, alternate Fall semesters since 1994

Plant Pathology 730 Physiology of the Fungi, 4 credits, alternate Spring semesters since 1993

Plant Science 796 Seminar in Plant Pathology and Environmental Microbiology, 1 credit,
each semester since Spring 1993

Plant Pathology 301 Diseases of Economic Plants, 3 credits, Spring 1997
[my contribution = 13% (team taught)]

Plant Science 420A Principles of Plant Pathology, 2 credits, Summer 1995
[my contribution = 25% as primary instructor (team taught)]

Plant Science 493D Crop Physiology, 3 credits, Spring 2010 (20%; team taught)

Guest Lectures

Two lectures *Plant Science 206*, Plant-pathogen interactions

One lecture annually since 2002, *Ag. Biochemistry 199*, Applications of biochemistry to research
on fungi and mycotoxins

Two lectures *Wood Science 696*, Grant writing strategies

Five lectures *Biology 124*, Genetically modified organisms in food

Eight lectures, *Environmental Microbiology 750*, Current topics in environmental microbiology

Seven lectures, *Plant Science 420C*, Current topics in plant pathology

Three lectures, *Plant Pathology 401*, Rusts

TEACHING

Advising and Mentoring

Graduate Students – Major Professor

Matthew Maust, Ph.D. student in Genetics (2015 – present)

Samantha Fabian, M.S. student in Genetics (2015 – present)

Paige Bragg, M.S. Genetics, 2017

Laboratory Technician, Protea Bioscience, Morgantown, WV

Yulia Bilovol, M.S. Applied and Environmental Microbiology, 2015

Current Position: Dental Student, West Virginia University, Morgantown, WV

Katy Ryan, Ph.D. Genetics, 2014

Current Position: Scientist, Protea Biosciences, Morgantown, WV

Christopher Moore, Applied & Environmental Micro. (non-thesis) M.S., 2011

Current Position: Technician, Mylan Pharmaceutical, Morgantown, WV

Prashanthi Mulinti, Ph.D. Genetics, 2011

Current Position: Scientist, FDA, Laurel, MD

Christine Coyle, Ph.D. Genetics, 2009

Current Position: Instructor, Wheeling Jesuit University, Wheeling, WV

Shaun Stanley, M.S. in Agriculture (non-thesis), 2008

Current position: Doctor of Osteopathic Medicine

Kerry Goetz, M.S. Genetics, 2006

Current position: eyeGENE Coordinator, NIH, Bethesda, MD

Andrea Sedlock, M.S. Genetics, 2003

Current position: Research Associate, NIH, Bethesda, MD

Prapassorn Damrongkool, Ph.D. Genetics, 2003

Current Position: Assistant Dean, School of Science, Mae Fah Luang University, Thailand

Linda Johnson, Ph.D. Plant & Soil Sciences, 2002

Current Position: Scientist, AgResearch, Palmerston North, New Zealand

Betsy Kurnik, M.S. Plant Pathology, 2000

Current Position: Technician, Monsanto, Research Triangle Park, NC

Suiyuan Zhang, M.S. Plant Pathology, 1996

Current position: Research Associate, NIH, Bethesda, MD

TEACHING

Advising and Mentoring

Postdoctoral Researchers

Dr. Richard Johnson, 2000 – 2002

Current Position: Scientist, AgResearch, Palmerston North, New Zealand

Dr. Seanna Annis, 1995 – 1997

Current Position: Associate Professor, University of Maine, Orono, ME

Additional Graduate Student Committees

<u>curriculum</u>	<u>current</u>	<u>completed</u>
Genetics	6	25
Plant Pathology	2	15
Environmental Microbiology	0	11
Animal Science	0	10
Biology	3	5
Horticulture	0	2
Agriculture	0	4
Wildlife Management	1	1
Microbiology and Immunology	0	2
Forestry	0	1
Public Health	0	1
University of Kentucky (PLPTH)	0	1
Indiana University (BIOL)	0	1

Undergraduate Researchers Mentored

Mentored 21 undergraduate students with independent research projects

- five were funded through an NSF REU grant on which I was a participant
- enrollment in graduate or professional programs after graduation:
 - graduate school (8)
 - medical school (5)
 - veterinary school (1)
 - nursing school (1)
 - dentistry school (1)

SERVICE

Leadership Activities

Assistant Director for graduate Programs, Plant and Soil Sciences, 2016 – present
Panel Manager, USDA NIFA AFRI Foundational program, 2014
Chair of Genetics and Developmental Biology Program, 2013 – present
Chair of Davis College Executive Committee, 2007 – 2009
Chair of Davis College Promotion and Tenure Committee, 2012
Chair of Division of Plant & Soil Sciences Promotion and Tenure Committee, 2008, 2013, 2016
President of WVU Branch of Gamma Sigma Delta, 2001 – 2003
Chair of Plant Pathology and Environmental Microbiology Discipline Group, 2006 – present

National and International Service Activities

Editorial Appointments

Journal of Chemical Ecology, 2011 – present
Phytopathology, 2002 – 2004

Review Panels

Panel Manager, USDA NIFA AFRI Foundational program, 2014
USDA NIFA Agricultural and Food Research Initiative (Panel Member), 2012, 2013
USDA National Research Initiative Competitive Grants Program (Panel Member), 1994, 2008
Molecular Biology/Biotechnology Faculty Review Board, Salem-Teikyo Univ., 1996 – 1999

Professional Society

Mycotoxicology subject area committee, American Phytopathological Society, 2001 – 2004

Local arrangements committee for the 2008 Annual Meeting of the Potomac Division of the American Phytopathological Society

Co-chairperson of local arrangements committee for the 1998 Annual Meeting of the Potomac Division of the American Phytopathological Society

Assistant Chairperson for two sessions at the 1998 Annual Meeting of the Potomac Division of the American Phytopathological Society

Co-organizer and Co-chairperson for "Resistance to Fungal Diseases" symposium at the 50th Annual Meeting of the Potomac Division of the American Phytopathological Society, 1993

Assistant Chairperson for "Biochemistry, Physiology, and Molecular Biology" session at the Annual Meeting of the American Phytopathological Society, 1990

Peer Review of Journal Articles

Over 30 journals; approximately 10 to 15 articles per year

Peer Review of Grants

USDA (numerous programs)
NSF (numerous programs)
National programs for Canada, Czech Republic, New Zealand, and Germany

SERVICE

Local and State Service Activities

Identification of fungi and plant diseases for:

The West Virginia Department of Agriculture; West Virginia Division of Natural Resources;
The Cooperative Extension Service; and,
Industries and citizens of West Virginia and Pennsylvania

Academic Service Activities

University Committees

Institutional Biohazard Committee, 1993 – present

Faculty Senate, 2003 – 2006

Faculty Senate Student Evaluation of Instruction Committee, 2004 – 2005

Advisory Council to the Associate Provost for Research, 1998 – 2001

College Committees

Student Grants and Aid Committee, 2012 – present

Promotion and Tenure Committee, 2008, 2012 (Chair), 2014

Interdisciplinary Task Force, 2010

Executive Committee, 2005 — 2009 (Chair, 2007 – 2009)

Graduate Council, 2003 – 2008

Biotechnology Faculty Search Committee, 2002 – 2003

Genetics Faculty Search Committee, 2001, 2008

Graduate Student Paper/Poster Event Committee, 2000 – 2001 (Chair, 2000)

Rewards and Incentives Committee (for Strategic Plan), 1998 – 1999

Division of Animal & Veterinary Sciences Faculty Search Committee, 1998

College of Agriculture & Forestry Academic Standards Committee, 1994 – 1997

(Purdue University) School of Agriculture Grade Appeals Committee, 1989

Division Committees

Promotion and Tenure Review Committee, 2006, 2007 (Chair), 2010

South Agricultural Sciences Building Safety Committee, 2006 – present

Brooks Hall Building Safety Committee, 2004 – 2005

Division of Plant & Soil Sciences Faculty Search Committee (at least seven positions)

(Purdue University) Department of Botany and Plant Pathology Faculty Search Committee, 1989

Miscellaneous Academic Service Activities

Chair, Plant Pathology & Environmental Microbiology Discipline Group, 2006 – present

Officer, WVU Chapter of Gamma Sigma Delta, 1997 – 2004; President 2001 – 2003

Organizer of College of Agriculture, Forestry & Consumer Sciences Graduate Student
Paper/Poster Event, 2000; Judge 7 times

Faculty Advisor to The Plant Pathology and Environmental Microbiology Graduate Student
Association, 1994 – 2001

Department of Biology Faculty Search Committee, 2004 – 2005