

HEATHER A. OWEN

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Education:

University of Akron; Akron, OH; B.S. Biology, Botany Specialization. May 1979.

Miami University; Oxford, OH; M.S. Botany, December 1983. Thesis: Cell Structure and Division in *Phaeoceros* (Anthocerotae) and its Comparison with Charophycean Algae. Advisors: Kenneth D. Stewart and Karl R. Mattox.

Miami University; Oxford, OH; Ph.D. Botany, Minor Biochemistry, August 1988. Dissertation: The Fine Structure of the Flagellar Apparatuses of the Chrysophytes *Dinobryon cylindricum* and *Uroglena americana*. Advisors: Kenneth D. Stewart and Karl R. Mattox.

Additional Training:

University of Minnesota; Lake Itasca Field Station, Summer 1983. Freshwater Algae Course.

The Ohio State University; Columbus, OH; July 15 - 26, 1991. Recombinant DNA Technology Workshop.

Professional Experience:

November 2000 to the present; Associate Scientist and Director, Electron Microscope Laboratory, Department of Biological Sciences, University of Wisconsin - Milwaukee.

August 1996 to October 31 2000; Instrumentation Innovator, Research and Director, Electron Microscope Laboratory, Department of Biological Sciences, University of Wisconsin - Milwaukee.

August 1994 to July 1996; Assistant Professor and Director, Electron Microscopy Facility, Department of Biology, Western Kentucky University.

September 1991 to July 1994; Research Associate, Chemistry Department, Miami University. Research Topic: Morphological and molecular characterization of fertility-impaired *Arabidopsis thaliana* lines produced by T-DNA mutagenesis.

September 1988 - August 1991; Post-doctoral Fellow, Zoology Department, Miami University. Research Topic: Environmental toxicology, effects of copper on zooplankton and phytoplankton in field and laboratory experiments.

Publications:

Liu, X., Huang, J., Wang, Yao, Khanna, K., Zhixin, X., Owen, H.A. and Zhao, D. 2010. The role of *floral organs in carpels*, an *Arabidopsis* loss-of-function mutation in *MicroRNA160a*, in organogenesis and the mechanism regulating its expression. *Plant J.* 62,416-428.

Butzin, N.C., Owen, H.A. and Collins, M.L.P. 2010. A new system for heterologous expression of membrane proteins: *Rhodospirillum rubrum*. *Protein Expression Purif.* 70,88-94.

Wei, M., Sivadas, P., Owen, H.A., Mitchell, D.R. and Yang, P. 2010. Chlamydomonas mutants display reversible deficiencies in flagellar beating and axonemal assembly. *Cell Motility and the Cytoskeleton.* 67,71-80.

Liu, X., Huang, J., Parameswaran, S., Ito, T., Seubert, B., Auer, M., Rymaszewski, A., Jia, G., Owen, H.A. and Zhao D. 2009. The *SPOROCYTELESS/NOZZLE* gene is involved in controlling stamen identity in *Arabidopsis*. *Plant Phys.* 151:1401-1411.

Hull-Sanders, H.M., Johnson R.H., Owen, H.A. and Meyer, G.A. 2009. Influence of polyploidy on insect herbivores of native and invasive genotypes of *Solidago gigantea* (Asteraceae). *Plant Signaling & Behavior* 4:1-3.

Pradhan, B., Kohlmeyer, R.R., Setyowati, K., Owen, H.A. and Chen, J. 2009. Nanoengineering of advanced carbon nanotube-polymer composite infrared sensors. *Carbon* 47:1686-1692.

Hull-Sanders, H.M., Johnson R.H., Owen, H.A. and Meyer, G.A. 2009. Effects of polyploidy on secondary chemistry, physiology, and performance of native and invasive genotypes of *Solidago gigantea* (Asteraceae). *Amer. J. Bot.* 96:762-770.

Boateng, K.A., Yang, X., Dong, F., Owen, H.A. and Makaroff, C.A. 2008. SWI1 is required for meiotic chromosome remodeling events. *Molecular Plant* 1:620-633.

Lovern, S.B., Owen, H.A., Klaper, R. 2008. Electron microscopy of gold nanoparticle intake in the gut of *Daphnia magna*. *Nanotoxicology* 2:43-48.

Jia, G., Liu, X., Owen, H.A. and Zhao, D. 2008. Signaling of cell fate determination by the TPD1 small protein and EMS1 receptor kinase. *Proc. Natl. Acad. Sci. U.S.A.* 105:2220-2225.

Yang, C., Owen, H.A. and Yang, P. 2008. Dimeric heat shock protein 40 binds radial spokes for generating coupled power strokes and recovery strokes of 9+2 flagella. *J. Cell Biol.* 180:403-415.

Goetsch, M., Owen, H., Goldman, B. and Forst, S. 2006. Analysis of the PixA inclusion body protein of *Xenorhabdus nematophila*. *J. Bacteriol.* 188:2706-2710.

Fawley, M.W., Fawley, K.P. and Owen, H.A. 2005. Diversity and ecology of small coccoid green algae from Lake Itasca, Minnesota, USA, including *Meyerella planktonica*, gen. et sp. nov. (Trebouxiophyceae, Chlorophyta). *Phycologia* 44:35-48.

Cristobal, R., Edmiston, C.E., Runge-Samuelson, C.L., Owen, H.A., Firszt, J.B. and Wackym, P.A. 2004. Fungal biofilm formation on cochlear implant hardware after antibiotic-induced fungal overgrowth within the middle ear. *Pediatr. Infect. Dis. J.* 23:774-778.

Brantner, C.A., Remsen, C.C., Owen, H.A., Buchholz, L.A. and Collins, M.L.P. 2002. Intracellular localization of the particulate methane monooxygenase and methanol dehydrogenase in *Methylomicrobium album* BG8. *Arch. Microbiol.* 178:59-64.

Paxson-Sowders, D.M., Dodrill, C.H., Owen, H.A. and Makaroff, C.A. 2001. DEX1, a novel plant protein, is required for exine pattern formation during pollen development in *Arabidopsis*. *Plant Phys.* 127:1739-1749.

Giese, D.R., Lamelas, F.J., Owen, H.A., Plass, R. and Gajdardziska-Josifovska, M. 2000. Atomic force microscopy and scanning electron microscopy study of MgO (110) surface faceting. *Surface Science* 457:326-336.

Lee, S., Owen, H.A., Prochaska, D.J. and Barnum, S.R. 2000. HSP16.6 is involved in the development of thermotolerance and thylakoid stability in the unicellular cyanobacterium, *Synechocystis* sp. PCC 6803. *Curr. Micro.* 40:283-287.

Heimler, I., Rawlins, R.G., Owen, H.A. and Hutz, R.J. 1998. Dioxin perturbs, in a dose- and time-dependent fashion, steroid secretion, and induces apoptosis of human luteinized granulosa cells. *Endocrinology* 139:4373-4379.

Maiti, M.K., Krishnasamy, S.K., Owen, H.A. and Makaroff, C.A. 1997. Molecular characterization of glyoxalase II from *Arabidopsis thaliana*. *Plant Mol. Bio.* 35:471-481.

Paxson-Sowders, D.M., Owen, H.A. and Makaroff, C.A. 1997. A comparative ultrastructural analysis of exine pattern development in wild-type *Arabidopsis* and a mutant defective in pattern formation. *Protoplasma* 198:53-65.

Pierson, B.M., Owen, H.A., Feldman, K.A. and Makaroff, C.A. 1996. Characterization of three male-sterile mutants of *Arabidopsis thaliana* exhibiting alterations in meiosis. *Sex. Plant Reprod.* 9:1-16.

Owen, H.A. and Makaroff, C.A. 1995. Ultrastructure of microsporogenesis and microgametogenesis in *Arabidopsis thaliana* (L.) Heynh. ecotype Wassilewskija (Brassicaceae). *Protoplasma* 185:7-21.

Vaughn, K.C., Ligrone, R., Owen, H.A., Hasegawa, J., Campbell, E.O., Renzaglia, K.S. and Monge-Najera, J. 1992. The anthocerote chloroplast. *New Phytol.* 20:169-190.

Winner, R.W. and Owen, H.A. 1991. Toxicity of copper to *Chlamydomonas reinhardtii* (Chlorophyceae) and *Ceriodaphnia dubia* (Crustacea) in relation to changes in water chemistry in a freshwater pond. *Aquat. Toxicol.* 21:157-170.

Garvey, J.E., Owen, H.A. and Winner, R.W. 1990. Toxicity of copper to the green alga, *Chlamydomonas reinhardtii*, as affected by humic substances of terrestrial and freshwater origin. *Aquat. Toxicol.* 19:89-96.

Winner, R.W. and Owen, H.A. 1991. Seasonal variability in the sensitivity of freshwater phytoplankton communities to a chronic copper stress. *Aquat. Toxicol.* 19:73-88.

Smoker, J.A., Owen, H.A. and Barnum, S.R. 1990. Localization of proteins in filamentous cyanobacteria using immunogold electron microscopy. *Methods Mol. Cell. Biol.* 2:59-65.

Smoker, J.A., Owen, H.A. and Barnum, S.R. 1990. Immunogold localization of ribulose-1,5-bisphosphate carboxylase/oxygenase in the nitrogen-fixing cyanobacterium, *Plectonema boryanum*. *Protoplasma* 156:113-116.

Vaughn, K.C., Campbell, E.O., Hasagawa, J., Owen, H.A. and Renzaglia, K.S. 1990. The pyrenoid is the site of ribulose 1,5-bisphosphate carboxylase/oxygenase accumulation in the hornwort chloroplast. *Protoplasma* 156:117-129.

Winner, R.W., Owen, H.A. and Moore, M.V. 1990. Seasonal variability in the sensitivity of freshwater lentic communities to a chronic copper stress. *Aquat. Toxicol.* 17:75-92.

Owen, H.A., Stewart, K.D. and Mattox, K.R. 1990. Fine structure of the flagellar apparatus of *Uroglena americana* (Chrysophyceae). *J. Phycol.* 26:142-149. (Conception 90%, Experiments 100%, Analyses 60%, Writing 100%)

Owen, H.A., Mattox, K.R. and Stewart, K.D. 1990. Fine structure of the flagellar apparatus of *Dinobryon cylindricum* (Chrysophyceae). *J. Phycol.* 26:131-141. (Conception 30%; Experiments 100%, Analyses 50%; Writing 100%)

Owen, H.A. 1989. Polystyrene specimen support films for the collection of ultrathin serial sections. *J. Electron Microsc. Tech.* 13:288-269.

Smoker, J.A., Owen, H.A., Lehn Jr., L.P. and Barnum, S.R. 1989. Ultrastructure of the nitrogen-fixing, nonheterocystous cyanobacterium, *Plectonema boryanum*. *Protoplasma* 152:130-135.

Manuscripts in Preparation:

Snyder, H., He, H., Park, D., Steeber, D., Owen, H. and Forst, S. Novel regulation and function of type 1 Mrx fimbriae of *Xenorhabdus nematophila*.

Invited Presentations:

Paxson-Sowders, D.M., Dodrill C.H., Kostic, E.L., Owen, H.A. and Makaroff, C.A. 2004. DEX1, A Protein Required for Exine Pattern Development in *Arabidopsis thaliana*. XI International Palynological Congress. Granada, Spain. (Presented by H.A. Owen).

Owen, H.A. 1998. Microscopic characterization of T-DNA tagged male-sterile *Arabidopsis thaliana* lines. Midwest Microscopy and Microanalysis Society Meeting. Milwaukee, WI.

Presentations:

Zhao, D., Gengxiang J., Liu, X. and Owen, H.A. 2008. Signaling of anther cell fate determination by the TPD1 small protein and EMS1 receptor kinase in *Arabidopsis*. Plant Biology 2008, Mérida, Mexico.

Lovern, S.B., Owen, H.A., and R. Klaper. 2006. Characterization and enumeration of carbon nanoparticles via Transmission Electron Microscopy (TEM). Overcoming Obstacles to Effective Research Design in Nanotoxicology, presented by Taylor and Francis and the Journal of Nanotoxicology. Cambridge, MA.

Yang, C., Diener, D.R., Rosenbaum, J.L., Owen, H.A. and Yang, P. 2005. HSP40 Is Required for the Final Assembly of Radial Spoke Complex in Flagella. 45th Annual Meeting The American Society for Cell Biology, San Francisco CA.

Peñalva-Arana, D. C., Feinberg, B., Owen, H. and Strickler, R. 2005. *Daphnia* sensory system - exploring its neurobiology and exploiting its behavioral response. Spring Midwest Microscopy and Microanalysis Society Meeting "Imaging Biomolecular Interactions". Evanston, IL.

Fawley, M.W., Fawley, K.P., Buchheim, M.A., Buchheim, J.A., Bailey, J.C. and Owen, H.A. 2003. Diversity and distribution of microalgae: the Itasca Microbial Observatory. NSF Microbial Observatories PI Meeting. Arlington, VA.

Schuck, T.P., Xue, C. Makaroff, C.A. and Owen, H.A. 2003. Characterization of an *Arabidopsis* meiotic mutant line produced by an unusual T-DNA insertion event. 14th International Conference on *Arabidopsis* Research. Madison, WI.

Gajdardziska-Josifovska, M. and Owen, H.A. 2002. Searching for phytoferritin in unstained plant sections. Microscopy and Microanalysis 2002. Quebec City, Canada.

Schuck, T.P., Makaroff, C.A. and Owen, H.A. 2001. Characterization of three mutant phenotypes produced by back-crossing a single reduced fertile T-DNA tagged *Arabidopsis* line. 12th International Conference on *Arabidopsis* Research. Madison, WI.

Owen, H.A., Paxson-Sowders, D.M. and Makaroff, C.A. 2000. Morphological and Genetic Analyses of a T-DNA tagged reduced fertile mutant of *Arabidopsis* exhibiting aberrant exine patterning. 11th International Conference on *Arabidopsis* Research. Madison, WI.

Fife-Danielson, S.K., Brantner, C.A., Owen, H.A., Larson, W.L. and Jaradeh, S. 1998. Microscopic analysis of iron deposition in paraneoplastic myopathy. Midwest Microscopy and Microanalysis Society Meeting. Milwaukee, WI.

Brantner, C.A., Owen, H.A., Remsen, C.C. and Collins, M.L.P. 1998. Analysis of copper in *Methylomicrobium album* BG8. Midwest Microscopy and Microanalysis Society Meeting. Milwaukee, WI.

Paxson-Sowders, D.M., Owen, H.A., Dodrill, C.H. and Makaroff. 1997. Isolation and characterization of a male-sterile *Arabidopsis thaliana* mutant defective in pollen wall formation. 8th International Conference on *Arabidopsis* Research. Madison, WI.

Owen, H.A., Paxson-Sowders, D.M. and Makaroff, C.A. 1997. Ultrastructure of microsporogenesis in *Arabidopsis*: A comparison of fixation by high-pressure freezing and freeze-substitution with conventional chemical fixation. 8th International Conference on *Arabidopsis* Research. Madison, WI.

Winstead, J.E. and Owen, H.A. 1996. Detection and removal of sulfur from secondary tissues of forest tree species. Botanical Society of America.

Peirson, B.N., Makaroff, C.A. and Owen, H.A. 1995. Morphological and molecular analysis of an *A. thaliana* meiotic mutant. 6th International Conference on *Arabidopsis* Research. Madison, WI.

Paxson-Sowders, D.M., Owen, H.A., Dodrill, C.H., Owens, B.A. and Makaroff, C.A. 1995. Isolation and characterization of a male-sterile *Arabidopsis thaliana* mutant that exhibits alterations early in microsporogenesis. 6th International Conference on *Arabidopsis* Research. Madison, WI.

Makaroff, C., Owen, H., Krishnasamy, S., Peirson, B., Paxson-Sowders. 1995. Isolation and characterization of male-sterile *Arabidopsis* mutants exhibiting defects in meiosis. 6th International Conference on *Arabidopsis* Research. Madison, WI.

Makaroff, C.A., Cleaver, B.N., Owen, H.A., Dodrill, C.H. and Paxson, D.M. 1993. Morphological and genetic analyses of three male-sterile *Arabidopsis thaliana* mutants generated by T-DNA insertional mutagenesis. 5th International Conference on *Arabidopsis* Research. The Ohio State University, Columbus, OH.

Owen, H.A. and Makaroff, C.M. 1993. Ultrastructure of microsporogenesis in *Arabidopsis thaliana* (L. Heynh.) ecotype Wassilewskija. (Brassicaceae). 5th International Conference on *Arabidopsis* Research. The Ohio State University, Columbus, OH.

Winner, R.W. and Owen, H.A. 1990. Seasonal variability of phytoplankton to a chronic copper stress. Eleventh annual meeting of the Society for Environmental Toxicology and Chemistry. Arlington, VA.

Owen, H.A. 1990. Deflagellation of *Chlamydomonas reinhardtii* as an indicator of copper toxicity. Third annual Algal Ecology Consortium. Erlanger, Kentucky.

Winner, R.W., Owen, H.A. and Moore, M.V. 1989. The use of *in situ* enclosures to evaluate seasonal variability of a pond community to a chronic copper stress. Tenth annual meeting of the Society for Environmental Toxicology and Chemistry. Toronto, Ontario.

Vaughn, K.C. and Owen, H.A. 1989. Organization of the hornwort (Anthocerotae) chloroplast. Plant Phys. 89F:83.

Owen, H.A. 1989. Polystyrene support films for serial section collection. Spring Meeting, Electron Microscopy Society of the Ohio River Valley.

Owen, H.A. 1988. The flagellar apparatus of *Uroglenopsis* sp. The Chromophyte Algae: Problems and Perspectives. Plymouth, England.

Owen, H.A. 1987. The flagellar apparatus of *Dinobryon cylindricum* (Chrysophyta). J. Phycol. Volume 23, supplement to June 1987.

Owen, H.A. 1984. Cell structure and division in *Phaeoceros* (Anthocerotae) and its comparison with charophycean algae. Ohio Journal of Science 84:8.

Funded Grants:

National Science Foundation Grant No. CHE-0723002. MRI: Acquisition of a High-Resolution Scanning Electron Microscope for an Interdisciplinary, Multi-User Facility Serving Life, Physical, and Materials Sciences. Peter Geissinger, Marija Gajdardziska-Josifovska, Nikolai A. Kouklin, Heather A. Owen and Jorg C. Woehl. \$603,617.

National Science Foundation Grant No. DBI-0079794. Acquisition of a Confocal Microscope for Neural and Cell Biology. R. David Heathcote, Chaoyang Zeng, Heather A. Owen and Jane L. Witten. \$231,000 plus \$99,000 UWM Cost Sharing.

National Science Foundation Grant No. DUE-9451235. Multi-disciplinary Incorporation of Scanning Electron Microscopy into the Undergraduate Biological and Physical Science Curriculum. Heather A. Owen, Deborah W. Kuehn, Douglas L. Harper, Christopher Groves, Wei-Ping Pan and John Riley. \$66,000 plus \$67,500 WKU Cost Sharing.

Western Kentucky University President's Special Grant Fund. Upgrading Biology Departmental Darkroom for Use in Transmission Electron Microscopy (TEM) and Scanning Electron Microscopy (SEM) Courses. \$1,078.28.

Western Kentucky University Summer Fellowship. Ultrastructural and Molecular Analyses of T-DNA Tagged Nuclear Male Sterile Mutants of *Arabidopsis thaliana* . \$5,000.00.

Western Kentucky University President's Special Grant Fund. Travel, Lodging and Related Expenses for Attendance of JEOL Scanning Electron Microscope Training Course in Boston, MA . \$1116.00.

Teaching Experience

University of Wisconsin - Milwaukee

 Biological Electron Microscopy, Lecture
 Scanning Electron Microscopy Laboratory
 Transmission Electron Microscopy Laboratory
 Foundations of Biological Sciences II (50% of course covering plants), Lecture

Western Kentucky University

 Cell Biology, Lecture
 Cell Biology Laboratory
 Techniques and Theory of Electron Microscopy, Lecture and Laboratory
 Biological Concepts I, Laboratory
 Introduction to Molecular Biology, Laboratory
 Organismal Biology I (Botany), Laboratory

Miami University

 Basic Plant Cultivation for the Home and Garden, Laboratory
 General Botany, Laboratory
 Introductory Plant Morphology, Laboratory
 Natural History of Plants, Lecture
 Natural History of Plants, Laboratory
 Basic Horticulture, Lecture