

# Dr. Joe Shellhammer

---

## About Me

I teach Intro Microbiology and Human Anatomy and Physiology at Wichita State University. In my extra time, I also hold MCAT Biology Prep Sessions, teach a Physics lab now and then and when I'm not teaching, I'm usually working on my house or my Dad's 1965 Ford Galaxie 500. Also, I'm a huge baseball fan, especially the Texas Rangers. All three of my kids are named after legendary Hall of Fame Pitcher, Nolan Ryan.

## Current Position

**Fairmount Lecturer in the Biological Sciences Department at Wichita State University**

2010 – present

**Teaching responsibilities include:**

- Intro to Microbiology
- Human Anatomy and Physiology
- Immunology (Spring 2011, 2012, 2013)
- Physics 214L (Physics Electronics Lab TA) - Fall 2011, Spring 2012, 2013
- Physics 214 (General College Physics 2, Electricity and Magnetism, Waves, Optics and Modern Physics)

**Additional teaching:**

- MCAT preparation for Biology (Spring and Summer 2013)

## Previous Work Experience

**Science Teacher, Cheney High School, Cheney, KS**

2003 – 2010

**Teaching responsibilities included:**

- 9<sup>th</sup> Grade Physical Science and Earth / Space Science
- 11<sup>th</sup> Grade Chemistry (one section each during 2003-04 and 2004-05 School Years)
- 12<sup>th</sup> Grade Physics

**Physics Lecturer, Wichita State University**

Spring 2009 – Spring 2010 (part-time)

**Teaching responsibilities included:**

- Phys 213 General College Physics I – Algebra / Trig-based physics for non-majors (Lecture); spring semester, 2009.
- Phys 502 Science Investigations: Physics – Algebra-based lab for education majors (Lab); fall 2009 – spring 2010.

**Manufacturing Specialist, Conoco Carbon Fibers, Ponca City, OK**

2001-2003

1997 – 2001                      Deer Creek-Lamont Public School

**Teaching responsibilities included:**

- 7<sup>th</sup> Grade Life Science
- 8<sup>th</sup> Grade Earth and Physical Sciences
- 9<sup>th</sup> Grade Applied Biology and Chemistry
- 10<sup>th</sup> Grade Biology II (Human Anatomy and Physiology)
- Advanced Placement Chemistry (11<sup>th</sup> and 12<sup>th</sup> Grades)
- Advanced Placement Physics B and C (11<sup>th</sup> and 12<sup>th</sup> Grades)

1996 – 1997 Oklahoma School of Science and Mathematics  
Oklahoma City, OK

**Coordinator for the Oklahoma Discovery Program**

- Served as Coordinator for a junior high / middle school science enrichment program.
- Conducted workshops for teacher and administrator orientation, training, and in-service.
- Used Microsoft Windows applications, such as Word, Excel, Access, and PowerPoint for correspondence, database management, presentations, and book keeping / record keeping duties.

1994 - 1997 Oklahoma School of Science and Mathematics  
Oklahoma City, OK

**Professor of Biology**

Joined the Oklahoma School of Science and Mathematics Biology Department in the fall of 1994.

- Taught Advanced Genetics, Botany, Ecology, General Biology, Genetics, Invertebrate Zoology, Microbiology, Plant Taxonomy, and Vertebrate Zoology.
- Created and maintained the first “Biology Department Home Page” for the Oklahoma School of Science and Mathematics’ web site.
- Created and maintained web pages for each course listed above and provided notes, assignments, and other information for each course over the Internet.

1991 – 1994 Oklahoma Medical Research Foundation  
Oklahoma City, OK

**Post-doctoral Research Fellow**

- Joined the Oklahoma Medical Research Foundation Program in Cell and Molecular Biology in the fall of 1991.
- Conducted basic research on genetic control of bacterial DNA transfer.
- Used and programmed microprocessor-controlled instruments for the molecular analysis of relevant microbial genes.
- Used Macintosh-based graphics applications, such as Canvas, for slide production used in scientific presentations.

1986 - 1991 Oklahoma State University Stillwater, OK

**Graduate Teaching / Research Assistant**

- Entered graduate school in the Department of Botany and Microbiology, fall, 1986.
- Taught Introductory Microbiology Laboratory course in fall of 1986.
- Conducted basic, biochemical research on vitamin production in the mustard plant *Arabidopsis thaliana*, (common name, mouse ear cress).
- Used IBM applications for word processing, data entry and analysis, and Macintosh-based graphics production for relevant projects.

1984 - 1986 Oklahoma State University Stillwater, OK

**Undergraduate Research Assistant**

- Was invited to work in the Department of Chemistry in the fall of 1984.

- Conducted basic research in organic chemistry directed toward the synthesis of new therapeutic drugs and the study of petroleum maturation processes simulated in a laboratory environment.

**Education** 1986 - 1991 Oklahoma State University Stillwater, OK  
**Ph.D. in Botany**

1982 - 1986 Oklahoma State University Stillwater, OK  
**BS in Microbiology**

**Professional Development**

**2003**

- Understanding By Design – Ubd workshop at ESDAK in Hutchinson, KS (2-day workshop)

**2004**

- Kagan Cooperative Learning Workshop at Hesston KS (4-day workshop)

**2005**

- Computers in Science Education workshop at ESDAK in Hutchinson, KS (1-day workshop)

**2006**

- Regional NSTA Convention in Omaha, NE – attended many sessions, presentations and workshops during 2 and ½ days.

**2007**

- Reciprocal Teaching Workshop presented at Cheney High School (2 half-day workshops during Early Release In Service Days)
- Inquiry-Based Learning workshop at ESDAK in Hutchinson (June)
- QuarkNet Physics workshop at Kansas State University (July and November; also 2008)

**2009**

- QuarkNet Particle Physics Boot Camp at Fermi Lab, Chicago (July 2009)

**Honors and awards** **First place** at the University of Oklahoma Health Sciences Center's Graduate Education Research Day (GERD) Poster Session, April, 1996.  
**Honorary Admissions Counselor** for the United States Naval Academy, 1994.  
**Oklahoma State University Center for Water Research Presidential Fellowship**, 1987-1991.

**Services**

**Biochemistry Grand Awards Judge** at the 41<sup>st</sup> Annual Tulsa International Science and Engineering Fair, 1990.

**Coordinated community service** projects between Oklahoma School of Science and Mathematics students and Myriad Botanical Gardens / Crystal Bridge, 1995.

**Member of Oklahoma School of Science and Mathematics' E-Team**, conducting plant biology demonstrations for Oklahoma elementary school students and teachers, 1994 – 1997.

**Held workshop** on discussion of "Teaching Molecular Biology to High School Students" at Stilwell High School, Stilwell, OK, during their teacher in-service day, spring, 1995.

**Held workshops and other extracurricular activities** for administrators, teachers, and students involved in the Oklahoma Discovery Program, 1996 – 1997.

**Facilitator** for American Lung Association of Oklahoma's "High School Heroes" program.

## **Meetings**

**American Chemical Society Meeting in Miniature**, Tulsa, OK, 1986.  
**International Meeting on the Biology of *Arabidopsis***, East Lansing, MI, 1987.

**Mid-America Molecular Biology Colloquium**, Oklahoma City, OK, 1987.

**Indiana Symposia on the Genetic Analysis of Development**, Bloomington, IN, 1987.

**UCLA Symposia on Molecular and Cellular Biology**, Steamboat Springs, CO, 1988.

**Conference on the Genetics and Molecular Biology of *Arabidopsis***, Bloomington, IN, 1989.

**American Society for Microbiology**, Atlanta, GA, 1993.

**Regional NSTA Conference**, Omaha, NE, 2006

## **Skills and techniques used in research and teaching**

**Molecular Biology:** Cloning genomic and plasmid DNA in the bacterium *E. coli*; polymerase chain reaction (PCR); site-directed mutagenesis; DNA sequencing; DNA electrophoresis; DNA radiolabeling; single-strand conformational polymorphism analysis of DNA; restriction endonuclease analysis. **Protein Chemistry:** Gel filtration and affinity chromatography; electrophoresis; western blotting; *in vitro* enzyme assays; subcellular fractionation in *Arabidopsis thaliana*. **Cell Culture:** Fermentation growth of bacterial cultures; over-expression of cloned genes; *in vivo* enzyme assays with reporter plasmids in prokaryotes. Plant tissue culture (seed, embryo, and organ culture) in eukaryotes. **Microscopy:** Dissecting and compound light microscopy; brief experience with SEM and TEM techniques while in graduate school and at OSSM. **Genetics:** Mapping chromosomal mutations in *E. coli* using generalized transducing bacteriophage. **Chemistry and Biochemistry:** Enzyme assays; purification of metabolic pathway intermediates; ion-exchange chromatography; thin-layer chromatography; organic chemistry techniques; microbiological and enzymatic assay of vitamins and vitamin-related substances in plants and bacteria.

## **Publications and presentations**

**Abstract publications:** Shellhammer J, Meinke D (1988) An embryo-lethal mutant of *Arabidopsis thaliana* is a biotin auxotroph. J Cell Biochem Supp 12C:166

Patton D, Shellhammer J, Franzmann L, Schneider T, Reynolds A, Robinson K, Meinke D (1988) Embryo-lethal mutants of *Arabidopsis thaliana*. J Cell Biochem Supp 12C:164

**Article publications:** Bunce RA, Wamsley EJ, Pierce JD, Shellhammer AJ, Drumright RE (1987) Tandem Michael reactions for the construction of highly functionalized five-membered rings. J Org Chem 52:464-466 Bunce RA, Shellhammer AJ (1987) Formate esters by a Cannizzaro-Tishchenko reaction of Grignard and sodium alkoxides with formaldehyde. Org Prep Proced 19:161-166

Schneider T, Dinkins R, Robinson K, Shellhammer J, Meinke D (1988) An embryo-lethal mutant of *Arabidopsis thaliana* is a biotin

auxotroph. Dev Biol 131:161-167

**Meinke D, Patton D, Shellhammer J, Reynolds-Duffer A, Franzmann L, Schneider T, Robinson K** (1988) Lethal mutants and the genetic control of embryogenesis in *Arabidopsis thaliana*. In: Goldberg R (ed) The Molecular Basis of Plant Development, UCLA Symposia on Molecular and Cellular Biology, Vol. 92, pp. 121-132. Alan Liss, NY

**Shellhammer J, Meinke DW** (1990) Arrested embryos from the bio1 auxotroph of *Arabidopsis thaliana* contain reduced levels of biotin. Plant Physiol 93:1162-1167

**Poster presentations:** **Farmer K, Shellhammer J, Silverman P** A system for isolation of dominant negative mutants defective in conjugal DNA transfer in *E. coli*. Presented at the University of Oklahoma Health Sciences Center's Graduate Education Research Day (GERD) Poster Session, spring 1996.

**Shellhammer J, Meinke D** An embryo-lethal mutant of *Arabidopsis thaliana* is a biotin auxotroph. Presented at the Indiana Symposia on the Genetic Analysis of Development, Bloomington, IN, October 1987 and at The UCLA Symposia on Molecular and Cellular Biology, Steamboat Springs, CO, March, 1988.

**Patton D, Shellhammer J, Franzmann L, Schneider T, Reynolds A, Robinson K, Meinke D** Embryo-lethal mutants of *Arabidopsis thaliana*, presented by D Patton at the UCLA Symposia on Molecular and Cellular Biology, Steamboat Springs CO, March, 1988.

**Bond-Nutter D, Shellhammer J, Melcher U, Meinke D** A strategy to determine the molecular basis of lethality in a biotin auxotroph of *Arabidopsis thaliana*, presented by D Bond-Nutter at the Horticulture Biotechnology Conference, University of California, Davis, August, 1989.

**Shellhammer J, Meinke D** Analysis of a biotin auxotroph of *Arabidopsis thaliana*, presented at the Conference on The Genetics and Molecular Biology of *Arabidopsis*, Bloomington, IN, October, 1989; presented by D Meinke at the Fourth International Conference on *Arabidopsis* Research, Vienna, Austria, June, 1990.

**Paper presentations:** **Shellhammer J, Bunce RA**. Formation of formate esters by a Tishchenko reaction of Grignard and sodium alkoxides with formaldehyde, presented at the ACS Meeting in Miniature, Tulsa, OK, April, 1986.

**Bunce RA, Wamsley EJ, Drumright RE, Shellhammer J**. Tandem Michael reactions for the preparation of highly functionalized five-membered rings, presented by RA Bunce at the 192<sup>nd</sup> National ACS Meeting, Anaheim, CA, September, 1986.

**Shellhammer J, Dinkins R, Schneider T, Robinson K, Meinke D**. A biotin-requiring embryo-lethal mutant of *Arabidopsis thaliana*, presented at the International Meeting on the Biology of *Arabidopsis*, Michigan State University, East Lansing, MI, April, 1987.

**Shellhammer J, Meinke D**. An embryo-lethal mutant of *Arabidopsis thaliana* is a biotin auxotroph, presented at the Mid-America Molecular Biology Colloquium, Oklahoma City, OK, October, 1987.

**Patton DA, Shellhammer J, Meinke DW**. Arrested embryos from a biotin auxotroph of *Arabidopsis thaliana* lack lipid bodies, presented by D Patton at the Annual Meeting of the Oklahoma Academy of Sciences, Chickasha, OK, November, 1988.

**Grants and  
fellowships**

Oklahoma State University Center for Water Research Presidential  
Fellowship, 1987 – 1991.  
NIH, GM15626-01, "Analysis of the bifunctional SfrA/ArcA protein in *E.*  
*coli*", 1993-1994.  
Oklahoma Advance Placement Incentives Grants, 1997 and 1998.  
Watkins Summer Research Fellowship, Wichita State University,  
Department of Physics, 2008 and 2009

**References:**

Dr. William Hendry  
Department of Biological Science  
Wichita State University  
1845 Fairmount  
Wichita, KS 67260  
Phone: (316) 978-6081

1845 Fairmount St.  
Wichita, KS 67260-0032  
Phone: (316) 978-5224

Nick Solomey  
Chairman and Professor of Physics  
Department of Physics  
Wichita State University

Edna M. Manning, Ed.D., President  
Oklahoma School of Science and Math  
1141 N. Lincoln Blvd.  
Oklahoma City, OK 73104  
Phone: (405) 521-6436

Philip M. Silverman, Ph.D  
Member and Head  
Program in Molecular and Cell Biology  
Oklahoma Medical Research Foundation  
823 N.E. 13th Street  
Oklahoma City, OK 73104  
Phone: (405) 271-7663

David W. Meinke, Ph.D.  
Department of Cell and Molecular Biology  
Oklahoma State University  
Stillwater, OK 74078

Richard A. Bunce, Ph.D.  
Department of Chemistry  
Oklahoma State University