

# Melissa A. F. Daggett, Ph.D.

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## Education

- 1986 B.S. Kansas State University, Manhattan, KS (Major, Biology)
- 1987 B.S. Kansas State University, Manhattan, KS (Major, Education)
- 1997 Ph.D. University of Kansas, Lawrence, KS (Physiology & Cell Biology)
- 1997- 2000 Postdoctoral Fellowship (Gene Regulation, Reproduction and Development), University of Kansas Medical Center, Kansas City, MO

## Professional Teaching Experience:

August 2009 – Present      **Associate Professor**, Missouri Western State University, St. Joseph, MO

Courses: COL 199 Freshman Seminar  
BIO 105 Principles of Organismal Biology Lab only  
BIO 106 Principles of Cell Biology w/ Lab  
BIO 101 Principles of Biology w/ Lab (non-majors)  
BIO 215 Molecular Cell Biology w/ Lab  
BIO 250 Anatomy and Physiology Lab only  
BIO 311 Animal Physiology w/ Lab  
BIO 410 Advanced Cell Biology w/ Lab  
BIO 411 Developmental Biology w/ Lab

August 2003 – July 2009      **Assistant Professor**, Missouri Western State University, St. Joseph, MO

August 2001 - July 2003      **Adjunct Assistant Professor**, Johnson County Community College, Overland Park, KS. & Longview Community College, Lee's Summit, MO

Courses: BIOL135 Principles of Cell & Mol. Biol. w/Lab  
BIOL 225 Human Physiology w/ Lab  
BIOL130 Environmental Science Lecture  
BIOL131 Environmental Science Lab  
BIOLOGY 208 Microbiology w/Lab

January 2000 - May 2001      **Adjunct Faculty**, Natural and Allied Health Sciences & Mathematics, Avila College, Kansas City, Missouri.

Courses: BI 250 10 General Microbiology w/ Lab  
BI 110 20 Principles of Biology w/ Lab  
NS 211 10 Environmental Science w/ Lab

August 1992 - December 1997      **Teaching Assistant**, Department of Physiology and Cell Biology University of Kansas, Lawrence, Kansas.

Course: Mammalian Physiology Laboratory  
Human Physiology Laboratory.  
Embryology Laboratory

November 1989 - July 1992      **Education Technician**, Department of Microbiology, University of Kansas, Lawrence, Kansas.

Duties: Prepare media, buffers and solutions for laboratory courses.  
Maintain records and inventory.

## Professional Research Experience:

- May 2003 - Present      **Associate Professor**, Missouri Western State University, St. Joseph, MO  
Projects: 1) The use of zebrafish in undergraduate education and research. 2) The development, implementation and assessment of techniques and approaches used to improve laboratory science skills.
- August 2000  
May 2001      **Student Research Advisor**, Natural and Allied Health Sciences & Mathematics, Avila College, Kansas City, MO.  
Project: Determine the effects of atrazine on zebrafish embryonic development.
- February 2000-  
August 2000      **Research Associate**, Department of Biochemistry/ Molecular Biology, University of Kansas Medical Center, Kansas City, KS.  
Project: Determine the effect of polycystin I signaling on the GST-Ya promoter activity in the kidney.
- May 1999-  
July 1999      **Course Co-Coordinator**, Frontiers in Reproduction: Molecular and Cellular Concepts and Applications, MBL, Woods Hole, MA.  
Duties: Assisting in laboratory preparations, instruction and animal husbandry for NIH sponsored course.
- October 1997-  
January 2000      **Postdoctoral Fellow**, Department of Molecular and Integrative Physiology, University of Kansas Medical Center, Kansas City, MO.  
Project: Determine the cell-specific mechanisms involved in the expression of the FSH receptor and SF-1 genes in the gonads.
- March 1997-  
October 1997      **Postdoctoral Fellow**, Department of Biochemistry & Molecular Biology University of Kansas Medical Center, Kansas City, KS.  
Project: Delineating the cis-acting elements and trans-acting factors regulating metallothionein gene expression during pregnancy.
- June 1994 -  
July 1996      **Research Assistant**, Department of Physiology and Cell Biology University of Kansas, Lawrence, KS.  
Project: Research the localization and expression of a microtubule-associated protein in sea urchin eggs and by a recombinant baculovirus expression system.
- February 1988 -  
October 1989      **Electron Microscopy Technician**, HCA Wesley Medical Center, Wichita, KS.  
Duties: Tissue preparation, microtome technician, and photographic developing in a diagnostic/research EM laboratory.

## Armed Services Experience:

- February 1986 -  
February 1994      **Medical Specialist**, United States Army Reserve, 410th Medical Evacuation Hospital, Topeka, Kansas.  
Duties: Performed readiness training in patient care at area hospitals.
- November 1990 -  
May 1991      **Medical Specialist**, United States Army, 410th Medical Evacuation Hospital, Saudi Arabia.  
Duties: Participated in the operation and maintenance of the hospital and performed patient care in emergency treatment unit during Operation Desert Storm.

## **Awards and Honors**

- 1988 Army Achievement Medal, Operation Dusty Bull, Ft. Hood, Texas
- 1991 Army Commendation Medal, Operation Desert Storm, Saudi Arabia
- 1993 Ida Hyde Scholarship, University of Kansas, Lawrence, KS
- 1994 Dr. Stanley L. Twomey Memorial Award, University of Kansas, Lawrence, KS
- 1995 American Society Cell Biology Predoctoral/Student Travel Award
- 1996 W. K. Candlin Memorial Physiological Scholarship, University of Kansas, Lawrence, KS
- 1999 Serono Symposia USA, XVth Testis Workshop, Travel Award
- 2008 Governors Distinguished Professor in Teaching, Missouri Western State University, St. Joseph, MO

**Professional Memberships** -- American Association for the Advancement of Science; Association of College and University Biology Educators; American Physiological Society; Society for Developmental Biology; Missouri Academy of Sciences; Beta Beta Beta National Biology Honor Society

## **Grants and Fellowships Awarded**

- 1993 ONR - Advanced Training in Molecular Marine Biology Fellowship "Cell Biology of Early Development: Ecological and Physiological Aspects", Stanford University, Hopkins Marine Station, Monterey, CA.
- 1997 Postdoctoral Fellow, Reproductive Biology Training Grant (T32 HD07455), University of Kansas Medical Center, Kansas City, KS
- 1998 NIH Postdoctoral Fellow, National Research Service Award (1F32 HD08500-01), University of Kansas Medical Center, Kansas City, KS
- 2003 Strategic Planning Implementation Fund (SPIF) for Applied Learning Grant, Missouri Western State College, St. Joseph, MO.
- 2004 Undergraduate Summer Research Institute, Missouri Western State University, St. Joseph, MO. "Characterization of Two Microtubule-Associated Proteins in Zebrafish" to Aaron Bunker\* and Melissa A. F. Daggett
- 2005 Summer Research Institute, Missouri Western State University, St. Joseph, MO. "Changes in Protein Expression Due to Environmental Stress Placed on Regional Aquatic Life" to Melissa A. F. Daggett
- 2006 Undergraduate Summer Research Institute, Missouri Western State University, St. Joseph, MO. "Prevalence of Different Tick Species and Ehrlichia Disease Agents in Public Areas Around St. Joseph, MO" to Shellie Murril\* and Melissa A. F. Daggett
- 2008 Undergraduate Summer Research Institute, Missouri Western State University, St. Joseph, MO. "Development of a Teaching Module for Improving Basic Laboratory Skills in Undergraduates Entitled: An Investigative Zebrafish Toxicity Assay" to Melissa A. F. Daggett
- 2009 Undergraduate Summer Research Institute, Missouri Western State University, St. Joseph, MO. "The Potential Endocrine Disrupting and Toxicological Potential of Triclosan Exposure on Early Embryonic Development in Zebrafish" to Ryan Good\* and Melissa A. F. Daggett.

## Areas of Research Interest

- Molecular, Cellular and Physiological Aspects of Environmental Toxins and Pharmaceutical and Personal Care Products (PPCPs) on zebrafish and other aquatic organisms.
- Development of laboratory skill performance assessments.

## Publications

- (\* = student co-authors)
- Suprenant, K. A., and **Daggett, M. A. F.** (1995): Sea Urchin Microtubules. *Current Topics in Developmental Biology Series: Roles of the Cytoskeleton in Early Development*. 31, 65-99.
- Brisch, E. L., **Daggett, M. A. F.**, and Suprenant, K. A. (1996): Cell cycle-dependent phosphorylation of the 77 kD EMAP *in vivo* and association with the p34<sup>cdc2</sup> kinase. *J. Cell Sci.* 109, 2885-2893.
- **Daggett, M. A. F.**, Li, Q., Weaver, R. F., and Suprenant, K. A. (1998): Overexpression of the 77 kD echinoderm microtubule associated protein (EMAP), a WD-40 repeat protein, in baculovirus-infected Sf9 cells. *Cell Motil. & Cytoskel.* 41, 57-67.
- Heckert, L. L., **Daggett, M. A. F.**, and Chen, J. K. (1998): The FSH receptor gene is regulated by an E-box and multiple downstream elements. *Mol. Endocrinol.* 12, 1499-1512.
- Li, Q., Hu, N., **Daggett, M. A. F.**, Chu, W. A., Bittel, D., Johnson, J. A., and Andrews, G. K. (1998): Participation of upstream stimulatory factor (USF) in Cadmium-induction of the mouse metallothionein-I gene. *Nucleic Acids Res.* 26, 5182-5189.
- Suprenant, K. A., Tuxhorn, J. A., **Daggett, M. A. F.**, Aherns, D. P., Hostetler, A.\*, Palange, J. M., VanWinkle, C. E., and Livingston, B. T. (2000): Conservation of the WD-repeat, microtubule-binding protein, in sea urchins, humans, and the nematode *C. elegans*. *Dev. Genes Evol.* 210, 2-10.
- **Daggett, M. A. F.**, Rice, D., and Heckert L.L. (2000): The nuclear hormone receptor SF-1 requires an E-box and CCAAT box for expression in Sertoli and Leydig cells. *Biol. Reprod.* 62, 670-679.
- Heckert, L. L., Sawadogo, M., **Daggett, M. A. F.**, and Chen, J. K. (2000): The USF proteins regulate transcription of the follicle-stimulating hormone receptor but are insufficient for cell-specific expression. *Mol. Endocrinol.* 11, 1836-48.
- **Daggett, M. A. F.**, Talley, N.\* and Lee, J.\* (2007): The use of crayfish in determining water quality: adapting a summer undergraduate research project into laboratory teaching modules. *Bioscene* 33(3): 13-17.

## Presentations/Workshops at Professional Conferences and Meetings:

- (\* = student co-authors)
- **Foltz, M. A.**, and Suprenant, K. A. (1993): Immunogold labeling of purified microtubules at the electron microscope level. Graduate Student Symposium. University of Kansas, Lawrence, KS
- **Foltz, M. A.**, and Suprenant, K. A. (1994): Ultrastructural localization of the 77 kD sea urchin MAP (EMAP) on purified microtubules and isolated spindles of *S. purpuratus*. Graduate Student Symposium, University of Kansas, Lawrence, KS

- **Foltz, M. A.**, Li, Q., Weaver, R. F., and Suprenant, K. A. (1994): Expression, localization and functional analysis of the 77 kD EMAP, a mitotic map, in baculovirus infected Sf9 cells. *Molecular Biology of the Cell* . 5:189a.
- **Daggett, M. A. F.**, Weaver, R. F., and Suprenant, K. A. (1995): Changes in microtubule organization in baculovirus infected Sf9 cells expressing the 77 kD EMAP co-infected with a baculovirus coding for tau. *Molecular Biology of the Cell* . 6:257a.
- **Daggett, M. A. F.**, Li, Q., Andrews, G. K. (1997): Upstream stimulatory factor (USF) binds to E-box1 in the mouse metallothionein-I proximal promoter: reevaluation of the roles of USF in basal promoter activity. The Fourth Annual International Metallothionein Meeting, Kansas City, MO, USA.
- Heckert, L. L., **Daggett, M. A. F.**, Chen, J. K. (1998): Expression of the Follicle-stimulating hormone receptor in Sertoli cells requires an E-box and several downstream elements. 80<sup>th</sup> Annual Meeting of The Endocrine Society, New Orleans, LA.
- **Daggett, M. A. F.**, Rice, D., Chen, J. K., Heckert, L.L (1999): SF-1 expression in Sertoli cells and developing gonads. Sero Symposia USA, XVth Testis Workshop, Louisville KY.
- **Daggett, M. A. F.**, (2002): Zebrafish: A Useful Model for Biology Majors and Non-Majors Laboratories. Association of College and University Biology Educators, Columbia College, Chicago IL.
- Caldwell, B. D., **Daggett, M. A. F.** (2005): "A Learning Community Designed to Link Chemistry and Biology Laboratory Courses." American Chemical Society Meeting, San Diego, CA.
- Bunker, A.\*, **Daggett, M. A. F.** (2004): "Characterization of an Echinoderm-like Microtubule-associated Protein (EML) in Zebrafish" Undergraduate Summer Research Institute Symposium, Missouri Western State College, St. Joseph, MO
- Bunker, A.\*, **Daggett, M. A. F.** (2005): "Characterization of an Echinoderm-like Microtubule-associated Protein (EML) in Zebrafish" Beta Beta Beta District Northcentral-2 Convention, Reece Biological Research Station. (3<sup>rd</sup> place award)
- Bunker, A.\*, **Daggett, M. A. F.** (2005): "Characterization of an Echinoderm-like Microtubule-associated Protein (EML) in Zebrafish" American Society of Biochemistry and Molecular Biology, San Diego, CA.
- **Daggett, M. A. F.** (2005): "The use of adult and embryonic zebrafish in undergraduate independent research projects." American Society of Biochemistry and Molecular Biology, San Diego, CA.
- **Daggett, M. A. F.** (2005): "Implementing Independent Research Projects for Undergraduates using Adult and Embryonic Zebrafish." Workshop presented at Association of College and Undergraduate Educators, Southeast Missouri State University, Cape Girardeau, MO.
- Talley, N.\*, Lee, J.\*, Williams, K.\*, Triplet, R.\*, and **Daggett, M. A. F.** (2005): The Use of Biological Organisms for Determining Water Quality. Summer Research Institute Symposium, Missouri Western State College, St. Joseph, MO
- Lee, J.\*, Talley, N.\*, and **Daggett, M. A. F.** (2005): "A Molecular Approach for Using Crayfish to Determine Water Quality in Small Streams." Ecological Genomics Symposium, Lenexa, KS.

- Lee, J.\* Talley, N.\*, and **Daggett, M. A. F.** (2006): "Crayfish as a model organism for determining the water quality of small streams" Missouri Natural Resources Conference, Tan-Tar-A Resort, Lake of the Ozarks, MO.
- Baker, J., Caldwell, B., **Daggett, M. A. F.**, Eckdahl, T. (2006): "Faculty working together to conduct undergraduate research." Conference on Applied Learning in Higher Education, Missouri Western State University, St. Joseph, MO.
- **Daggett, M. A. F.** and Caldwell B. D. (2006): "Design and implementation of skill-specific assessments in introductory and advanced cell biology and biochemistry courses." American Society of Biochemistry and Molecular Biology, San Francisco, CA.
- Talley, N. L.\* and **Daggett, M. A. F.** (2006): "The Use of Biological Organisms for Determining Water Quality." American Society of Biochemistry and Molecular Biology, San Francisco, CA. (Honorable mention)
- Thomsen, K. M.\* and **Daggett, M. A. F.** (2006): "The expression of topoisomerase II alpha mRNA is increased by the minor groove DNA-binding drug Hoechst 33258 in African green monkey kidney (Vero) cells." American Society of Biochemistry and Molecular Biology, San Francisco, CA.
- Thomsen, K. M.\* and **Daggett, M. A. F.** (2006): "The expression of topoisomerase IIA mRNA is increased by the DNA-MGBD Hoechst 33258 in Vero." Beta Beta Beta District Northcentral-2 Convention, Lyons KS. (2<sup>nd</sup> place award)
- Talley, N. L.\* and **Daggett, M. A. F.** (2006): "Using Crayfish to Determine Water Quality in Missouri Streams." Tri-Beta Biennial National Convention, Florida Institute of Technology, Melbourne, FL
- Thomsen, K. M.\* and **Daggett, M. A. F.** (2006): "The expression of topoisomerase II alpha mRNA is increased by the minor groove DNA-binding drug Hoechst 33258 in African green monkey kidney (Vero) cells." Tri-Beta Biennial National Convention, Florida Institute of Technology, Melbourne, FL
- Murril, S.\* and **Daggett, M. A. F.** (2006): "Prevalence of different tick species and Ehrlichia disease agents in public areas around St. Joseph, MO. Undergraduate Summer Research Institute Symposium, Missouri Western State University, St. Joseph, MO
- **Daggett, M. A. F.**, and Caldwell, B. D. (2006): Skill-Specific Assessments in Introductory Cell Biology and Biochemistry Courses. Association of College and Undergraduate Educators (ACUBE), Millikin University, Decatur, Illinois.
- **Daggett, M. A. F.**, Rushin, J., Boutwell, D., Chevalier, C., Eckdahl, T. and Seeger, S. (2006): The Development and Use of Two-week Long Learning Cycle Blocks (LCBs) in a Freshman General Biology Course for Non-majors. Association of College and Undergraduate Educators (ACUBE), Millikin University, Decatur, Illinois.
- **Daggett, M. A. F.** and Caldwell B. D. (2007): Development and implementation of skill-specific assessments in introductory cell biology and biochemistry laboratories." Missouri Academy of Sciences, St. Joseph, Missouri.
- **Daggett, M. A. F.** (2007): "The use of adult and embryonic zebrafish in extending bioassays in undergraduate research projects." Missouri Academy of Sciences, St. Joseph, Missouri.
- Edwards. C.\*, and **Daggett, M. A. F.** (2007): "The minor groove binding drug berenil alters the expression of topoisomerase II alpha in zebrafish." Missouri Academy of Sciences, St. Joseph, Missouri.

- Lee, J.\*, Treece, J.\*, and **Daggett, M. A. F.** (2007): "The development of a bioassay to determine environmental water quality using zebrafish." Missouri Academy of Sciences, St. Joseph, Missouri.
- **Daggett, M. A. F.** (2007): "Performance-Based Skill Assessment in Introductory Cell Biology and Biochemistry Courses." Conference on Applied Learning in Higher Education, Missouri Western State University, St. Joseph, MO.
- **Daggett, M. A. F.** (2007): "The use of adult and embryonic zebrafish in extending bioassays in undergraduate research projects." American Society of Biochemistry and Molecular Biology, Washington, DC.
- Edwards, C.\* and **Daggett, M. A. F.** (2007): "The minor groove binding drug berenil up-regulates the expression of topoisomerase II alpha in developing zebrafish." American Society of Biochemistry and Molecular Biology, Washington, DC.
- Lee, J.\*, Treece, J.\*, and **Daggett, M. A. F.** (2007): "Development of a bioassay to determine environmental water quality using zebrafish." Beta Beta Beta District Northcentral-2 Convention, Marquette Nebraska.
- **Daggett, M. A. F.** (2007): "The use of adult and embryonic zebrafish in extending bioassays in undergraduate research projects." Association of College and Undergraduate Educators (ACUBE), Loras College, Dubuque, Iowa.
- Rushin, J., Baker, J., Boutwell, D., Chevalier, C., **Daggett, M.**, Eckdahl, T., Seeger, S., and Walton, K. (2007): "Using two-week learning cycle blocks (LCB's) as a way for non-major general biology students to do science in the lab." National Association of Biology Teachers, Atlanta, GA.
- **Daggett, M. A. F.** (2008): "Design, implementation and assessment of basic laboratory skills in an introductory molecular cell biology course." American Physiological Society, San Diego, CA.
- Showalter, M.\*, and **Daggett, M. A. F.** (2008): "The use of adult and embryonic zebrafish in undergraduate teaching laboratories and student-driven independent research projects." 8<sup>th</sup> International Conference on Zebrafish Development and Genetics, Madison, WI.
- Showalter, M.\*, Slawson, A.\*, Longe, S.\*, and **Daggett, M. A. F.** (2008): "Effects of the antimicrobial triclosan on early embryonic development in zebrafish." Summer Research Institute Symposium, Missouri Western State University, St. Joseph, MO
- **Daggett, M. A. F.** (2008): "Inquiry-based laboratory modules for teaching and assessing basic laboratory skills in an introductory cell biology laboratory using zebrafish." Association of College and Undergraduate Educators (ACUBE), Hopkinsville Community College, Hopkinsville, Kentucky.
- Rushin, J., Chevalier, C., **Daggett, M.**, Hartman, K., Ashley, D., Baker, J., Walton, K. (2009): "Assessing Applied Learning Skills in a First Year College General Biology for Non-Majors Laboratory Setting: The Effects of Two-Week Long Learning Cycle Blocks (LCBs) on the Development of Science Process Skills". Applied Learning in Higher Education, Missouri Western State University, St. Joseph, MO.
- **Daggett, M. A. F.**, Edwards, C., Showalter, M. (2009): "The Minor Groove Binding Drug Berenil Down-Regulates the Expression of Topoisomerase II Alpha in Zebrafish Larvae. American Physiological Society, New Orleans, LA.
- Good, R.\*, Edwards, C.\*, Showalter, M.\*, Slawson, A.\*, Longe, S.\*, **Daggett M. A. F.** (2009): Effects of the DNA Binding Drug Berenil and the Antimicrobial Triclosan on Early Embryonic Development in Zebrafish. Midwest Regional Society of Developmental Biology, Iowa City, IA.

## Seminars:

- **Foltz, M. A.** (1993): The effects of quinacrine, a phospholipase A2 inhibitor, on the fertilization and development of *Dendraster excentricus*. China Point Academy of Sciences Symposium. Hopkins Marine Station, Stanford University, Monterey, CA
- **Daggett, M. A. F.** (1996): The overexpression of the 77 kD EMAP in baculovirus infected Sf9 cells. Invited speaker, Gamete and Embryo Biology Training Program Seminar. University of Wisconsin, Madison, WI.
- **Daggett, M. A. F.** (1997): Developmental Localization and Functional Analysis of the 77 kD Echinoderm Microtubule-Associated Protein (EMAP). Seminar in Reproductive Biology, University of Kansas Medical Center, Kansas City, KS.
- **Daggett, M. A. F.** (1998): Expression of the Follicle-Stimulating Hormone Receptor (FSHR) gene in Sertoli cells requires an intact E-box. Seminar in Reproductive Biology, University of Kansas Medical Center, Kansas City, KS.
- **Daggett, M. A. F.**, (1999): Transcriptional regulation of steroidogenic factor -1 (SF-1) in the testis. Seminar in the Department of Integrative and Molecular Physiology, University of Kansas Medical center, Kansas City, KS.
- **Daggett, M. A. F.**, (2000): Steriodogenic Factor-1 (SF-1) a gene important for gonad development. Invited Seminar at the Division of Natural and Allied Health Sciences, Avila College, Kansas City, MO.
- **Daggett, M. A. F.** (2002): "Male or Female?: The role of the Y chromosome in sex determination", Invited Seminar at the Department of Biology, Central Missouri State University, Warrensburg, MO.
- **Daggett, M. A. F.** (2003): "Sea Urchin Microtubules: from the Ocean to the Test Tube and Beyond", Invited Seminar at Tri-Beta Honor Society Meeting, Missouri Western State College, St. Joseph, MO.
- **Daggett, M. A. F.** (2004): "The Joys and Tribulations of using Zebrafish in Undergraduate Research Projects: Including a Few Success Stories! Invited Seminar at Avila University, Kansas City, MO.
- **Daggett, M. A. F.** (2006): "Expanding Bioassays Using Molecular and Cellular Approaches. Invited Seminar at Truman State University, Kirksville, MO.
- **Daggett, M. A. F.** (2009): "The Effects of the Antimicrobial Triclosan on Early Zebrafish Development. Invited Seminar at Avila University, Kansas City, MO.