August 2015

MICHAEL E. SMITH

Department of Biology
Western Kentucky University
Bowling Green, KY 42104
270-745-2405
michael.smith1@wku.edu
http://www.wku.edu/smithneurobiologylab/index.php

EDUCATION

Postdoctoral research, 2002-2005, The University of Maryland, College Park, MD. Biology.
Ph.D., 2001, The University of Texas at Austin, Austin, TX. Marine Science.
M.S., 1996, Brigham Young University, Provo, UT. Zoology.
B.S., 1994, Brigham Young University, Provo, UT. Zoology (University Honors).

PROFESSIONAL EXPERIENCE

2010-present	Associate Professor with Tenure, Dept. of Biology, Western Kentucky University
2005-2010	Assistant Professor, Department of Biology Western Kentucky University
2004-2005	Lecturer, Department of Biology, University of Maryland
2002-2005	Postdoctoral Research Associate, Department of Biology, University of Maryland
1996-2001	Graduate Research and Teaching Fellow, The University of Texas at Austin

AWARDS, FELLOWSHIPS, AND HONORARY SOCIETIES

WKU Ogden College of Science and Engineering Faculty Research/Creativity Award (2013)
WKU University Senate Biology Representative (2013-present)
Honorary Member, Golden Key International Honour Society (2012)
Nominated for WKU Teaching Award (2011)
Western Kentucky University Summer Faculty Award (2006, 2007, 2009, 2010)
University of Washington Visiting Scholar Award, collaborative research at the Virginia Merrill Bloedel Hearing Research Center (2008)
Western Kentucky University New Faculty Scholarship Award (2008)
Professor of the Year (2007), Student Govern. Assoc., Ogden College of Science & Engineering
Travel Award (2007), Effect of Noise on Aquatic Life Meeting, Nyborg, Denmark
Travel Award, 10th International Behavioral Ecology Congress, Finland (2004)
Best student oral presentation and travel award, Behavior and Physiology Symposium at the 5th International Congress on the Biology of Fish (2002)
University Continuing Fellowship, Graduate Studies, University of Texas at Austin (2000-2001)
Sally Richardson Award for best oral presentation, 24th Annual Larval Fish Conference (2000)
G. Fitzgerald Award, best poster at Ethology, Evolutionary Ecology, & Conservation of Fishes Meeting (2000)
E. J. Lund Research Fellowship Award in Marine Science (1999-2001)
David Bruton, Jr. Fellowship, Office of Graduate Studies, University of Texas at Austin (1999)
Honor Society of Phi Kappa Phi- University of Texas at Austin (1997)
Golden Key National Honor Society, Brigham Young University (1995)

August 2015

GRANT ACTIVITY (*Funded only; WKU External=**$1,400,776**; WKU Internal=**$69,000***)

2015-2018	NIH R15, $414,321, *Finding novel platinum (II) complex anti-cancer drugs with reduced ototoxicity*
2015-2016	NIH KY-INBRE Investigator, $40,000, *Finding novel platinum (II) complex anti-cancer drugs with reduced ototoxicity*
2014-2015	Kentucky Science and Engineering Foundation, Research and Development Excellence Program Grant, $30,000, *A zebrafish assay for testing ototoxicity of anti-cancer drugs*
2014-2015	NIH KY-INBRE Investigator, $40,000, *Finding novel platinum (II) complex anti-cancer drugs with reduced ototoxicity*
2014-2015	WKU Research and Creative Activities Program, $13,400, Finding novel platinum(II) complex anti-cancer drugs with reduced ototoxicity.
2012-2014	NIH KY-INBRE Investigator, $184,506, *Zebrafish: A model of auditory hair cell death and regeneration.*
2013-2014	WKU Research and Creative Activities Program, $15,900, Finding novel platinum(II) complex anti-cancer drugs with reduced ototoxicity.
2013	Faculty-Undergraduate Student Engagement (FUSE) Award, $5,000, *Effects of growth hormone antagonist on auditory hair cell regeneration in zebrafish*, Student-led research support for Amy Ni
2012	Faculty-Undergraduate Student Engagement (FUSE) Award, $4,600, *Growth hormone (GH) prophylactic effects on zebrafish auditory hair cell damage*, Student-led research support for Mackenzie Perkins
2012	WKU Biology NSF Research Experiences for Undergraduates (REU) Mentor, $1,000 for research supplies, Savannah Bell student, *Can growth hormone prevent noise-induced hearing loss in zebrafish?*
2012	NIH Kentucky INBRE, $24,810, *Next Generation Sequencing to Reveal Growth Hormone Pathways in Zebrafish Auditory Hair Cell Regeneration*
2011	WKU Biology NSF Research Experiences for Undergraduates (REU) Mentor, $1,000 for research supplies, Michael Sullivan student, *The effect of pile driving on the inner ears of striped bass*.
2010	WKU Research and Creative Activities Program, $15,000, *Microarray analysis for discovering growth hormone pathways during auditory hair cell regeneration in zebrafish (Danio rerio)*
2010	NIH Kentucky INBRE, $23,000, *Microarray analysis for examination of gene expression patterns during auditory hair cell regeneration in zebrafish*
2010	WKU's UISFL (Undergraduate International Studies and Foreign Language Program, Smith budget $8,500. Development of an Honors Colloquium course on entitled "*Honors 301- The Genius of China- Its History of Discovery and Invention*" to support the Chinese Language Program at WKU.
2010	WKU Summer Faculty Scholarship Award, $6,000, *The effects of pegvisomant on zebrafish auditory hair cell proliferation*.
2009	WKU Summer Faculty Scholarship Award, $6,000, *The effects of growth hormone on goldfish auditory hair cell proliferation.*
2009-2011	NIH K-INBRE Investigator, $200,000, *Zebrafish: a model of auditory hair cell death and regeneration.*

2008 WKU New Faculty Scholarship Award, $5,000, *Do regenerated auditory hair cells produce functional recovery in zebrafish?*

2007 NSF-SOMAS: Support of Mentors and their Students in the Neurosciences, $10,000, *Testing the Equal Energy Hypothesis in Noise-exposed Fishes.* (DUE-0426266)

2006-2009 NIH K-INBRE Investigator, $318,000, *Structural & Functional Recovery of Auditory Hair Cells in Zebrafish* (NIH P20 RR-16481)

2007 WKU Summer Faculty Scholarship. $6,000, *Testing the Equal Energy Hypothesis in Noise-exposed Fishes.*

2006 WKU Summer Faculty Scholarship. $6,000, *Tonotopic Organization of the Goldfish Saccule*

2005-2007 National Science Foundation, KY-EPSCoR Research Startup Fund, Neuroscience Faculty, $75,000

2005-2007 NIH INBRE Program, Faculty salary support, $25,000

2004-2005 National Organization for Hearing Research Foundation Grant, *A new model of noise-induced hair cell loss and regeneration*, Principal Investigator: M.E. Smith. Direct costs: $15,000.

2003-2005 NIH F32 DC-05890-01 Individual National Research Service Award, *Aging and susceptibility to hearing loss in zebrafish*, Principal Investigator: M.E. Smith. Direct costs: $90,000

2002-2003 Maryland Sea Grant Small Program Development Award, *Biological responses to acoustical stress in fishes*, Co-Principal Investigator: M.E. Smith. Direct costs: $10,000.

PROFESSIONAL SOCIETIES

Society for Neuroscience
Faculty for Undergraduate Neuroscience
Association for Research in Otolaryngology
International Society of Neuroethology
The Acoustical Society of America
Kentucky Academy of Science
Sigma Xi- The Scientific Research Society
National Association of IDeA Principal Investigators

PUBLICATIONS (* *student author*)

Submitted

Fehrenbach, A.K., King, S.E., Johnson, J.R., and Smith, M.E. 2015. The effects of sound exposure on axolotl (*Ambystoma mexicanum*) hearing. *Royal Society Open Science.*

Monroe, J.D., Manning, D.*, Uribe, P.*, Bhandiwad, A.*, Sisneros, J.A., Smith, M.E., Coffin, A. Auditory sensitivity differs between zebrafish lines: effects of fluorescent protein expression and genetic background. *Zebrafish*.

Smith, M.E., Wang, Y.*, and Sun. H. The time-course of the effects of growth hormone during zebrafish (*Danio rerio*) auditory hair cell regeneration. *Journal of Comparative Neurology.*

Webb, A.L.* and Smith, M.E. The relationship between body size and stridulatory sound production in loricariid catfishes. *Physiology & Behavior*.

Published

Smith, M.E., Monroe, J.D. 2015. Causes and consequences of sensory hair cell damage and recovery in fishes. *Advances in Experimental Medicine and Biology*.

Monroe, J.D., Rajadinakaran, G.*, and Smith, M.E. 2015. Sensory hair cell death and regeneration in fishes. *Frontiers in Cellular Neuroscience* 9:131.

Smith, M.E. 2015. The relationship between hair cell loss and hearing loss in fishes. Pp. 1079-1086. In: *The Effects of Noise on Aquatic Life II.* Popper, A.N. and Hawkins, A. (Eds.). Springer-Verlag.

Smith, M.E. and Rajadinakaran, G.* 2013. The transcriptomics to proteomics of hair cell regeneration: Looking for a hair cell in a haystack. *Microarrays* 2(3):186-207.

Casper, B., Smith, M.E., Halvorsen, M., Sun, H., Carlson, T., and Popper, A.N. 2013. Effects of exposure to pile driving sounds on fish inner ear tissues. *Comparative Biochemistry and Physiology, Part A* 166:352-360.

Uribe, P.M.*, Sun, H., Wang, K., Asuncion, J.D., Wang, Q., Steyger, P.S., Smith, M.E., and Matsui, J.I. 2013. Aminoglycoside-induced hair cell death of inner ear organs causes functional deficits in adult zebrafish (*Danio rerio*). *PLoS ONE* 8(3): e58755. Doi:10.1371/journal.pone.0058755.

Smith, M.E. 2012. Predicting hearing loss in fishes. Pp. 259-262. In: *The Effects of Noise on Aquatic Life.* Popper, A.N. and Hawkins, A. (Eds.). Springer-Verlag.

Sun, H., Lin, C-H.*, and Smith, M.E. 2011. Growth hormone promotes hair cell regeneration in the zebrafish (*Danio rerio*) inner ear following acoustic trauma. *PLoS ONE* 6 (11): e28372. Doi:10.1371/journal.pone.0028372.

Schuck, J.B.*, Sun, H., Penberthy, W.T., Cooper, N.G.F., Li, X., and Smith, M.E. 2011. Transcriptomic analysis of the zebrafish inner ear points to growth hormone mediated regeneration following acoustic trauma. *BMC Neuroscience* 12: 88, Doi:10.1186/1471-2202-12-88.

Schuck, J.B.*, Sun, H., Penberthy, W.T., Cooper, N.G.F., Li, X., and Smith, M.E. 2011. Transcriptomic analysis of the zebrafish inner ear points to growth hormone mediated regeneration following acoustic trauma. (Published zebrafish microarray gene expression data). *NCBI's Gene Expression Omnibus GEO Series Accession number* GSE29669. http://www.ncbi.nlm.nih.gov/geo/ query/acc.cgi?acc=GSE29669.

Smith, M.E., Schuck, J.B.*, Gilley, R.R.*, and Rogers, B.D.* 2011. Structural and functional effects of acoustic exposure in goldfish: evidence for tonotopy in the teleost saccule. *BMC Neuroscience* 12:19, Doi:10.1186/1471-2202-12-19.

Schuck, J.B.* and Smith, M.E. 2009. Cell proliferation follows acoustically-induced hair cell bundle loss in the zebrafish saccule. *Hearing Research* 253:67-76.

Stewart, P.C.* and Smith, M.E. 2009. Conspecific sound localization in *Otocinclus affinis*. *Proceedings of the Institute of Acoustics* 31(1): 230-234.

Smith, M.E. and Gilley, R.R.* 2008. Testing the equal energy hypothesis in noise-exposed fishes. *Bioacoustics* 17:343-345.

Wysocki, L.E., Davidson, J.*, Smith, M.E., Popper, A.N., Frankel, A., Ellison, W.,Welch, T., Ford, F., Bebak-Williams, J. 2007. The effects of aquaculture noise on the growth, survival and hearing of rainbow trout. *Aquaculture* 272:687-697.

Oxman, D.*, R. Barnett-Johnson, Smith, M.E., A.B. Coffin, D.L. Miller, R. Josephson, and A.N. Popper. 2007. The effect of vaterite deposition on otolith morphology, sound reception and inner ear sensory epithelia in hatchery-reared Chinook salmon (*Oncorhynchus tshawytscha*). *Canadian Journal of Fisheries and Aquatic Sciences* 64:1469-1478.

Popper, A.N., M.B. Halvorsen, A.S. Kane, D. Miller*, M.E. Smith, J. Song, P. Stein, and L.E. Wysocki. 2007. The effects of high-intensity, low-frequency active sonar on rainbow trout. *Journal of the Acoustical Society of America* 122(1):623-635.

Popper, A.N., M.E. Smith, P.A. Cott, B.W. Hanna, A.O. MacGillivray, M.E. Austin, and D.A. Mann. 2005. Effects of exposure to seismic airgun use on hearing of three fish species. *Journal of the Acoustical Society of America* 117(6):3958-3971.

Fuiman, L.A., Cowan, J.H., Jr., Smith, M.E., and O'Neal, J.P.* 2005. Behavior and recruitment success in fish larvae: variation with growth rate and the batch effect. *Canadian Journal of Fisheries and Aquatic Sciences* 62:1337-1349.

Belk, M.C., Johnson, J.B., Wilson, K.W., Smith, M.E., and Houston, D.D.* 2005. Variation in intrinsic individual growth rate among populations of leatherside chub (*Snyderichthys copei* Jordan & Gilbert): adaptation to temperature or length of the growing season? *Ecology of Freshwater Fishes* 14(2):177-184.

Smith, M.E., Kane, A.S., and Popper, A.N. 2004. Acoustical stress and hearing sensitivity in fishes: does the linear threshold shift hypothesis hold water? *Journal of Experimental Biology* 207:3591-3602.

Smith, M.E., Kane, A.S., and Popper, A.N. 2004. Noise-induced stress response and hearing loss in goldfish (*Carassius auratus*). *Journal of Experimental Biology* 207(3):427-435.

Popper, A. N., Fewtrell, J., Smith, M. E., and McCauley, R. D. 2004. Anthropogenic sound: effects on the behavior and physiology of fishes. *Marine Technology Society Journal* 37:33-38.

Smith, M. E., A. S. Kane, M. C. Hastings, and A. N. Popper. 2004. Physiological effects of noise on fishes. Pp. 299-304. *In*: Proceedings of the 8th International Congress on Noise as a Public Health Problem, R. G. de Jong, T. Houtgast, E. A. M. Franssen, and W. F. Hofman (eds.), Rotterdam, Netherlands.

Smith, M.E.* and L.A. Fuiman. 2004. Behavioral performance of wild-caught and laboratory-reared red drum *Sciaenops ocellatus* (Linnaeus) larvae. *Journal of Experimental Marine Biology and Ecology* 302(1):17-33.

Smith, M.E.* and L.A. Fuiman. 2003. Causes of growth depensation in red drum, *Sciaenops ocellatus*, larvae. *Environmental Biology of Fishes* 66:49-60.

Smith, M.E.* and M.C. Belk. 2001. Risk-assessment in western mosquitofish (*Gambusia affinis*): do multiple cues have additive effects? *Behavioral Ecology and Sociobiology* 51 (1):101-107.

Smith, M.E.* 2000. The alarm response of *Arius felis* to chemical stimuli from injured conspecifics. *The Journal of Chemical Ecology* 26 (7):1635-1647.

Fuiman, L.A., M.E. Smith*, and V. Malley.* 1999. Ontogeny of routine swimming speed and startle responses in red drum, with a comparison of responses to acoustic and visual stimuli. *Journal of Fish Biology* 55 (supplement A):215-226.

Smith, M.E.* and M.C. Belk. 1996. *Sorex monticolus*. Mammalian Species 528:1-5.

Published extended abstracts

Gopinath, R., Sun, H., Rinehart, C., Rouchka, E., Smith, M.E. 2012. Regulation of cell proliferation and apoptosis by growth hormone during zebrafish auditory hair cell regeneration. *BMC Bioinformatics* 13(Suppl 12):A3.

Smith, M.E., Sun, H., Schuck, J.B.*, and Moriyama, Shunsuke. 2010. Growth hormone induces proliferation in the zebrafish inner ear. *BMC Bioinformatics* 11(Suppl. 4):P26. Doi:10.1186/1471-2105-11-S4-P26.

Sun, H., Schuck, J.B.*, and Smith, M.E. 2010. The role of growth hormone in zebrafish (*Danio rerio*) auditory hair cell regeneration. *Assoc. Res. Otolaryngol. Abs. 33:209.*

Schuck, J.B.*, Lin, C-H.*, Penberthy, W.T., Li, X., Cooper, N.G.F., and Smith, M.E. 2009. Microarray analysis and quantitative real-time PCR validation of gene expression during auditory hair cell regeneration in zebrafish (*Danio rerio*). *BMC Bioinformatics* 10 (Suppl 7):A12.

Smith, M.E., Stewart, P.C.*, Webb, A.L.*, and Rogers, B.D.* 2009. Sound production and localization in loricariid catfishes. *Journal of the Acoustical Society of America* 125(4):2487.

Schuck, J.B*., Smith, M.E., Li, X., and Cooper, N.G.F. 2008. Microarray analysis of gene expression during auditory hair cell regeneration in zebrafish (*Danio rerio*). *BMC Bioinformatics* 9 (Suppl 7):P15.

Popper, A.N., Halvorsen, M.B., Miller, D.L., Smith, M.E., Song, J., Wysocki, L.E., Hastings, M.C., Kane, A.S., and Stein, P. 2005. Effects of surveillance towed array sensor system (SURTASS) low frequency active sonar on fish. *Journal of the Acoustical Society of America* 117(4):2440.

Popular articles

Smith, M.E. 2003. Do fish make noise or produce sounds? AccessScience Q&A Archives: Biological & Biomedical Science. Week of July 1, 2003. The McGraw-Hill Companies.

RECENT PRESENTATIONS (2006-2014; * *student presenter*)

King, S.E.*, Fehrenbach, A.K.*, Johnson, J.R., Smith, M.E. 2015. Functional recovery of axolotl hearing following sound exposure. WKU Student Research Conference, Bowling Green, KY. Best poster award.

Rogers, B.*, Smith, M.E. 2015. Hearing and a potentially novel peripheral auditory structure in *Semaprochilodus insignis*. WKU Student Research Conference, Bowling Green, KY.

Hodzic, D.*, Smith, M.E. 2015. The role of melanin in auditory function of zebrafish (*Danio rerio*). WKU Student Research Conference, Bowling Green, KY. Best poster award.

Fehrenbach, A.K.*, King, S.E.*, Johnson, J.R., Smith, M.E. 2105. Hearing and effects of sound exposure on the axolotl (*Amystoma mexicanum*). WKU Student Research Conference, Bowling Green, KY. Oral presentation.

Weller, K.K.*, Godinho, A.L., Smith, M.E. 2015. Sound production in three prochilodontid fish species from Brazil. WKU Student Research Conference, Bowling Green, KY.

Monroe, J.D., Williams, M.E., Smith, M.E. 2014. A high-throughput zebrafish assay for testing ototoxicity of anti-cancer drugs. Kentucky Innovation and Entrepreneurship Conference, Louisville, KY.

Monroe, J.D., Williams, M.E., Smith, M.E. 2014. Finding novel platinum(II) complex anti-cancer drugs. NIH Fifth Biennial National IDeA Symposium of Biomedical Research Excellence, Washington, D.C.

Smith, M.E. 2014. Fishing for a cure for deafness: Zebrafish and sensory hair cell regeneration. Department of Biology, Western Kentucky University. Invited seminar.

Smith, M.E. 2014. Fishing for a cure for deafness: Zebrafish and sensory hair cell regeneration. Department of Physiology and Developmental Biology, Brigham Young University. Invited seminar.

Manning, D.P.*, Uribe, P.*, Monroe, J.D., Smith, M.E., and Coffin, A.B. 2014. GFP expression in hair cells is correlated with reduced hearing sensitivity in transgenic zebrafish. Northwest Regional Society for Developmental Biology, Friday Harbor Laboratories, University of Washington, WA.

Smith, M.E. 2014. Hearing and hair cells in fishes. Invited seminar. Brigham Young University, Department of Physiology and Developmental Biology, Provo, UT.

Coffey, B.N.*, and Smith, M.E. 2014. Melanin as a possible oto-protective pigment in the ears of *Poecilia latipinna* and *Cyprinus carpio*. Association for Research in Otolaryngology 2014 Midwinter Research Meeting, San Diego, CA.

Ni, A.*, and Smith, M.E. 2014. Effects of growth hormone (GH) antagonist on zebrafish auditory hair cell regeneration. Association for Research in Otolaryngology 2013 Midwinter Research Meeting, San Diego, CA.

Smith, M.E. The relationship between hair cell loss and hearing loss in fishes. 2013. The Third International Conference on the Effects of Noise on Aquatic Life. Budapest, Hungary.

Ni, A.*, and Smith, M.E. 2013. Effects of growth hormone antagonist on zebrafish auditory hair cell regeneration. Southeast Regional IDeA Meeting, Little Rock, AR.

Smith, M.E., Sun, H., Perkins, M.*, Ni, A.* 2013. Growth hormone: A tonic for auditory hair cell loss? 50 Years of Underwater Bioacoustics Symposium, Mote Marine Laboratory, Sarasota, Florida.

Coffey, B.N.*, Smith, M.E. 2013. Melanin as a possible oto-protective pigment in fish ears. 50 Years of Underwater Bioacoustics Symposium, Mote Marine Laboratory, Sarasota, Florida.

Perkins, M*, Ni, Y*, Sun, H., Smith, M.E. 2013. Prophylactic effects of growth hormone on zebrafish auditory hair cell damage. Western Kentucky University Student Research Conference, Bowling Green, KY. Undergraduate oral presentation.

Ni, Y*, Perkins, M*, Sun, H., Smith, M.E. 2013. Effects of growth hormone antagonist on zebrafish auditory hair cell regeneration. Western Kentucky University Student Research Conference, Bowling Green, KY. Undergraduate poster presentation (1st Place in Natural Sciences).

Coffey, B.* and Smith, M.E. 2012. Aggressive acoustic behavior in *Yasuhikotakia modesta*: Does the Lombard effect hold water? WKU Student Research Conference, WKU, KY.

Rajadinakaran, G.*, Sun, H., Rinehart, C., Rouchka, E., Smith, M.E. 2012. Identification of growth hormone regulatory pathways using Next Generation Sequencing. Gordon Research Conference- Auditory Systems, Bates College, MA.

Rajadinakaran, G.*, Sun, H., Rinehart, C., Rouchka, E., Smith, M.E. 2012. Regulation of cell proliferation and cell death by growth hormone during zebrafish auditory hair cell regeneration. UT-ORNL-KBRIN Bioinformatics Summit 2012, Louisville, KY.

Rajadinakaran, G.*, Huifang, F., Rinehart C., Rouchka E., Smith, M.E. 2012. Cell proliferation and apoptotic pathways regulated in zebrafish auditory hair cell regeneration using Next Generation Sequencing. WKU Student Research Conference, WKU, KY.

Rajadinakaran, G.*, Sun, H., Rouchka, E., Smith, M.E. 2012. Examining pathways regulated in zebrafish auditory hair cell regeneration using Next Generation Sequencing. Association for Research in Otolaryngology 2012 Midwinter Research Meeting, San Diego, CA.

Coffey, B.* and Smith, M.E. 2011. Aggressive acoustic behavior in *Yasuhikotakia modesta*: Does the Lombard effect hold water? 97th Annual Kentucky Academy of Sciences Meeting, Murray State University, KY, Zoology Undergraduate Student Oral presentation (2nd Place).

Wang, Y.*, Sun, H., and Smith, M.E. 2011. Growth hormone promotes auditory hair cell regeneration in zebrafish (*Danio rerio*). 97th Annual Kentucky Academy of Sciences Meeting, Murray State University, KY, Graduate Physiology and Biochemistry Graduate Student Oral presentation (1st Place).

Rajadinakaran, G.*, Sun, H., Eteleeb, A., Rouchka, E., and Smith, M.E. 2011. Next Generation Sequencing identified regulation of pathways in zebrafish auditory hair cell regeneration. 97th Annual Kentucky Academy of Sciences Meeting, Murray State University, KY, Graduate Physiology and Biochemistry Graduate Student Oral presentation (2nd Place).

Smith, M.E. and Rajadinakaran, G.* 2011. Next Generation sequencing to reveal growth hormone pathways in zebrafish auditory hair cell regeneration. Southeast Regional IDeA Meeting, Sept. 22-24, New Orleans, LA.

Sullivan, M.T.*, Smith, M.E., and Sun, H. 2011. The effect of pile driving on the inner ear of striped bass (*Morone saxitilis*). Biology Summer Undergraduate Research Experience Symposium, WKU, KY.

Coffey, B.N.* and Smith, M.E. 2011. Aggressive acoustic behavior in *Yasuhikotakia modesta*: Does the Lombard effect hold water? Biology Summer Undergraduate Research Experience Symposium, WKU, KY.

Smith, M.E. 2011. Tracing tonotopy in teleosts. Bioacoustics of Fishes Special Session, Acoustical Society of America Meetings, Seattle, WA. Invited presentation.

Wang, Y.*, Sun, H., and Smith, M.E. 2011. Time-course of growth hormone effects on zebrafish (*Danio rerio*) auditory hair cell regeneration. Western Kentucky University 41st Annual Student Research Conference, Bowling Green, KY.

Sun, H., Wang, Y.*, and Smith, M.E. 2011. Time-course of growth hormone effects in zebrafish (*Danio rerio*) auditory hair cell regeneration. Association for Research in Otolaryngology 2010 Midwinter Research Meeting, Baltimore, MD.

Smith, M.E. 2010. Predicting hearing loss in fishes. Second International Conference on the Effects of Noise on Aquatic Life. Cork, Ireland.

Smith, M.E. 2010. Hair cell regeneration in teleost fishes: a review. June 21, 2010, Institute for Marine Biosystems and Neuroscience, Shanghai Ocean University, China, Invited lecture.

H. Sun, Lin, C-H.*, Wang, Y.*, Schuck, J.B.*, and Smith, M.E. 2010. Growth hormone promotes auditory hair cell regeneration. Biennial National IDeA Conference, June 16-18, 2010, Bethesda, Maryland.

Smith, M.E., Sun, H., Schuck, J.B.*, and Moriyama, S. 2010. Growth hormone induces proliferation in the zebrafish inner ear. UT-ORNL-KBRIN Bioinformatics Summit 2010, Lake Barkley State Park Resort, Cadiz, KY.

Smith, M.E. 2010. Hair cell regeneration in teleost fishes: a review. April 19, 2010, Acoustical Society of America Meetings, Baltimore, MD.

Sun, H., Schuck, J.B.*, and Smith, M.E. 2010. The role of growth hormone in zebrafish (*Danio rerio*) auditory hair cell regeneration. Association for Research in Otolaryngology 2010 Midwinter Research Meeting, Anaheim, CA.

Stewart, P.C.* and Smith, M.E. 2010. Gas-filled paired swimbladders: GPS for sound localization in loricariid catfishes. 40th Annual Western Kentucky University Student Research Conference, Bowling Green, KY.

Webb, A.L.* and Smith, M.E. 2010. Sound production in two loricariid catfish species. 40th Annual Western Kentucky University Student Research Conference, Bowling Green, KY.

Lin, C-H*, Sun, H., Schuck, J.B.*, and Smith, M.E. 2009. Effect of growth hormone on cell proliferation in the zebrafish (*Danio rerio*) ear. 95th Annual Kentucky Academy of Sciences Meeting, Highland Heights, KY, Graduate Physiology and Biochemistry Student Oral presentation (1st Place).

Beers, A.M.* and Smith, M.E. 2009. Behavioral context of sound production in *Otocinclus affinis*. 95th Annual Kentucky Academy of Sciences Meeting, Highland Heights, KY, Undergraduate Zoology Student Poster presentation.

Bhaskar, G.* and Smith, M.E. 2009. Sound production in *Polyphylla decemlineata*. 95th Annual Kentucky Academy of Sciences Meeting, Highland Heights, KY, Undergraduate Zoology Student Poster presentation.

Stewart, P.* and Smith, M.E. 2009. Effects of swim bladder deflation on sound localization in *Otocinclus affinis*. 95th Annual Kentucky Academy of Sciences Meeting, Highland Heights, KY, Undergraduate Zoology Student Poster presentation (1st Place).

Botta, S.K.K.R.* and Smith, M.E. 2009. Development and role of peripheral auditory structures in *Otocinclus affinis*. 95th Annual Kentucky Academy of Sciences Meeting, Highland Heights, KY, Graduate Physiology and Biochemistry Student Poster presentation.

Smith, M.E., Stewart, P.C.*, Webb, A.L.*, and Rogers, B.D.* 2009. Sound production and localization in loricariid catfishes. Invited speaker. Fish Bioacoustics Session of the Acoustical Society of America, Portland, OR.

Stewart, P.C.* and Smith, M.E. 2009. Conspecific sound localization in *Otocinclus affinis*. Fifth International Conference on Bio-Acoustics, Holywell Park, Loughborough University, United Kingdom.

Schuck, J.B.*, Lin, C-H., Penberthy, W.T., Li, X., Cooper, N.G.F., and Smith, M.E. 2009. Microarray analysis and quantitative real-time PCR validation of gene expression during auditory hair cell regeneration in zebrafish (*Danio rerio*). Bioinformatics Summit 2009, Fall Creek Falls State Park, Pikeville, TN.

Beers, A.M.* and Smith, M.E. 2009. The Relationship of sound production and behavior in *Otocinclus affinis*. Western Kentucky University Biology Summer Undergraduate Research Experience (BSURE) Symposium.

Schuck, J.B.*, Lin, C-H.*, Penberthy, W.T., Li, X., Cooper, N.G.F., and Smith, M.E. 2009. Microarray analysis and quantitative real-time PCR validation of gene expression during auditory hair cell regeneration in zebrafish (*Danio rerio*). Association for Research in Otolaryngology 2009 Midwinter Research Meeting, Baltimore, Maryland.

Smith, M.E. 2009. Auditory hair cell regeneration and gene expression in noise-exposed zebrafish (*Danio rerio*). Invited seminar speaker. Virginia Merril Bloedel Hearing Research Center, University of Washington, Seattle, WA.

Webb, A.L.* and Smith, M.E. 2008. Comparison of conspecific sound production and hearing thresholds between two loricariid catfishes. 94th Annual Kentucky Academy of Sciences Meeting, Lexington, KY, Undergraduate Zoology Student Oral presentation.

Stewart, P.C.* and Smith, M.E. 2008. Conspecific sound localization in *Otocinclus affinis*. 94th Annual Kentucky Academy of Sciences Meeting, Lexington, KY, Undergraduate Zoology Student poster presentation.

Lin, C-H. *, Penberthy, W.T., Schuck, J.B.*, Li, X., Cooper, N.G., and Smith, M.E. 2008. Microarray analysis of auditory hair cell regeneration in zebrafish (*Danio rerio*). Annual Kentucky Academy of Sciences Meeting, Lexington, KY, Graduate Student Physiology and Biochemistry poster presentation.

Gilley, R.R.* and Smith, M.E. 2008. The equal energy hypothesis: Does it hold water? WKU Biology Summer Undergraduate Research Symposium (BSURE).

Schuck, J.B.*, Smith, M.E., Li, X., and Cooper, N.G. 2008. Fishing for sound answers: Zebrafish as a model of auditory hair cell regeneration. National IDeA Symposium of Biomedical Research Excellence (NISBRE). Aug. 6-8. Washington, D.C.

Stewart, P.C.* and Smith, M.E. 2008. Conditioning of *Otocinclus affinis* using conspecific sounds 38th Annual WKU Student Research Conference, WKU, Bowling Green, KY.

Webb, A.L.* and Smith, M.E. 2008. Comparison of conspecific click sound production between *O. affinis* and *P. gibbiceps*. 38th Annual WKU Student Research Conference, WKU, Bowling Green, KY.

Gilley, R.R.* and Smith, M.E. 2008. Good Vibrations: Developing an Accurate Model for Hearing Loss in Fishes. 38th Annual WKU Student Research Conference, WKU, Bowling Green, KY.

Schuck, J.B.*, Smith, M.E., Li, X., and Cooper, N.G. 2008. Microarray analysis of auditory hair cell regeneration in zebrafish (*Danio rerio*). Bioinformatics Summit 2008, Lake Barkley State Resort, KY.

Schuck, J.B.* and Smith, M.E. 2008. Auditory hair cell regeneration in zebrafish (*Danio rerio*). Association for Research in Otolaryngology 2008 Midwinter Research Meeting, Phoenix, Arizona.

Gilley, R.R.* and Smith, M.E. 2007. Testing the Equal-Energy Hypothesis in tone-exposed fishes. Society for Neuroscience Meeting, San Diego, CA.

Schuck, J.B.* and Smith, M.E. 2007. Zebrafish: a potential model of gene expression during auditory hair cell regeneration. 93rd Annual Kentucky Academy of Sciences Meeting, Louisville, KY, 1st Place Graduate Student Oral presentation.

Webb, A.L.* and Smith, M.E. 2007. Sound production in two loricariid catfishes. 93rd Annual Kentucky Academy of Sciences Meeting, Louisville, KY, 1st Place Undergraduate Zoology Student Oral presentation.

Rogers, B.D.* and Smith, M.E. 2007. The auditory anatomy of the loricariid catfish *Pterygoplichthys gibbiceps*. 93rd Annual Kentucky Academy of Sciences Meeting, Louisville, KY, oral presentation.

Stewart, P.C.* and Smith, M.E. 2007. Testing sound localization in *Otocinclus affinis* using classical conditioning. 93rd Annual Kentucky Academy of Sciences Meeting, Louisville, KY, poster presentation.

Gilley, R.R.* and Smith, M.E. 2007. Testing the Equal-Energy Hypothesis in tone-exposed fishes. 93rd Annual Kentucky Academy of Sciences Meeting, Louisville, KY, 1st Place Undergraduate Physiology Student Oral presentation.

Schuck, J.B.* and Smith, M.E. 2007. Auditory hair cell regeneration in zebrafish (*Danio rerio*). 13th Annual Kentucky EPSCoR Conference. Oct. 2, 2007. Lexington, KY.

Smith, M.E. and Gilley, R.R.* 2007. Testing the Equal-Energy Hypothesis in noise-exposed fishes. 1st International Conference on Effects of Noise on Aquatic Life. Nyborg, Denmark.

Gilley, R.R.* and Smith, M.E. 2007. Testing the Linear Threshold Shift Hypothesis in Tone-exposed Goldfish. 37th Annual WKU Student Research Conference. 1st Place Biology oral presentation.

Rogers, B.D. and Smith, M.E. 2007. Anatomical study of the inner ear of *Pterygoplichthys gibbiceps*. Western Kentucky University Biology Summer Undergraduate Research Experience (BSURE) Symposium.

Webb, A.L.* and Smith, M.E. 2007. Sound production in loricariid catfishes. 37th Annual WKU Student Research Conference. Honorable Mention Biology oral presentation.

Rogers, B.* and Smith, M.E. 2007. Tonotopic representation in the goldfish saccule. 37th Annual WKU Student Research Conference. 1st Place Undergraduate poster presentation.

Schuck, J.B.*, Rogers, B.*, Gilley, R.R.* and Smith, M.E. 2007. Tonotopic representation in the goldfish saccule. Association for Research in Otolaryngology 2007 Midwinter Research Meeting, Denver, Colorado.

Webb, A.L.* and Smith, M.E. 2006. Sound production in two loricariid catfishes. 152nd Meeting: Acoustical Society of America, Honolulu, Hawaii.

Davidson, J., Wysocki, L.E., Smith, M.E., Popper, A.N., Frankel, A., Ellison, W.,Welch, T., Ford, F., Bebak-Williams, J. 2006. The effects of aquaculture noise on the growth and survival of rainbow trout. Aquaculture America Meeting, Las Vegas, NV.

Wysocki, L.E., Smith, M.E., Popper, A.N., Davidson, J., Frankel, A., Ellison, W., Ford, F., Bebak-Williams, J., 2006. The effect of aquaculture noise on hearing sensitivity and ear development of rainbow trout. Aquaculture America Meeting, Las Vegas, NV.

Schuck, J.B.*, Rogers, B.D., and Smith, M.E. 2006. Mapping frequency-dependent hair cell loss in the goldfish saccule. Physiology and Biochemistry Section, Kentucky Academy of Science 2006 Annual Meeting, Morehead, Kentucky.

Gilley, R.R.* and Smith, M.E. 2006. Testing the linear threshold shift hypothesis in tone-exposed goldfish. Physiology and Biochemistry Section, Kentucky Academy of Science 2006 Annual Meeting, Morehead, Kentucky.

Webb, A.L.* and Smith, M.E. 2006. Pectoral fin stridulatory sounds in armoured suckermouth catfishes. Zoology Section, Kentucky Academy of Science 2006 Annual Meeting, Morehead, Kentucky.

Smith, M.E., L.E. Wysocki, and A.N. Popper. 2006. Effects of background sound on fish. 151st Meeting: Acoustical Society of America, Providence, Rhode Island.

Mann, D.A., P. Cott, B. Hanna, A. MacGillivray, M. Austin, M.E. Smith, and A.N. Popper. 2006. Effects of riverine seismic air-gun exposure on fish hearing. 151st Meeting: Acoustical Society of America, Providence, Rhode Island.

Smith, M.E., A.B. Coffin*, D.L. Miller*, and A.N. Popper. 2006. Anatomical and functional recovery of the goldfish saccule following noise exposure. Association for Research in Otolaryngology 2006 Midwinter Research Meeting, Baltimore, Maryland.

Oxman, D.*, R. Barnett-Johnson*, **Smith, M.E.**, A.B. Coffin*, D.L. Miller*, R. Josephson, and A.N. Popper. 2006. Otolith crystal type affects hearing sensitivity in Chinook salmon. Association for Research in Otolaryngology 2006 Midwinter Research Meeting, Baltimore, Maryland.

PROJECTS CURRENTLY IN PROGRESS (†Sabbatical projects)

Zebrafish auditory hair cell death and regeneration:

- Disassociating ototoxicity from cytotoxicity in novel cisplatin(II) compounds: finding less ototoxic chemotherapy drugs using a zebrafish hair cell model (collaboration with Kevin Williams, Dept. of Chemistry, WKU)
- †Effects of gentamicin on zebrafish auditory hair cells and functional hearing (collaboration with Jonathan Matsui at Pomona College)
- Time-course of the effects of growth hormone on zebrafish auditory hair cell regeneration (Yajie Wang's Masters project)
- †Can growth hormone prevent hearing loss in zebrafish? (Mackenzie Perkin's Honors thesis project)
- †Effects of growth hormone antagonist on zebrafish hair cell regeneration (Ami Ni's Honors thesis project)
- †Hearing deficits of zebrafish mutants lacking melanocytes or melanin (Bethany Coffey's Master's thesis project in collaboration with Allison Coffin at University of Washington)
- Next-Generation Sequencing to discover gene regulation pathways in the zebrafish inner ear following growth hormone injection post-acoustic trauma (Gopinath Rajadinakaran's Master's thesis)

Anthropogenic sound and fishes:

- †Effects of pile-driving on the auditory hair cells and functional hearing in striped bass and tilapia (collaboration with Arthur Popper at the U. Maryland)
- †Link between pressure and particle motion components of sound stimuli and hearing loss in teleost fishes

- Models for predicting hearing loss in fishes

Sound production and hearing in loricariid catfishes:

- Morphology of the inner and peripheral ear of *Pterygoplichthys gibbiceps* (Brian Rogers Honors thesis)
- Development of the auditory structures in *Otocinclus* and the role of the swim bladder (Sri Kiran Botta Master's thesis)
- Sound localization in *Otocinclus affinis* and the importance of the bi-lobed swim bladder (Patrick Stewart Honors thesis)
- †The relationship between size and the stridulatory sound production in loricariid catfishes (Amanda Webb Master's thesis)

Novel sound production and vibration mechanoreception in chameleons:

- Measuring vibrations resulting from vocal sound production in chameleons with an accelerometer and characterizing the sensory apparatus on the toes and tails that allow them to detect these vibrations (in collaboration with Steve Huskey, WKU)

POSTDOCTORAL AND STUDENT LAB RESEARCHERS

Postdoctoral researchers:

- Dr. Jerry D. Monroe (2013-present)
- Dr. Huifang Sun (2009-2013), Medical resident, St. Barnabas Medical Center, N.J.
- Dr. Songhai Li (2009), Research Fellow, National University of Singapore
- Dr. William T. Penberthy (2008-2009), Research Faculty, Univ. of Central Florida

Graduate students:

- Amy Fehrenbach (2013-2015), Ph.D. candidate, University of Memphis
- Bethany Coffey (2012-2014), Ph.D. candidate, University of Hawaii
- Gopinath Rajadinakaran (2010- 2012), Ph.D. candidate, Univ.of Connecticut
- Yajie Wang (2009- 2012)
- Amanda Webb (2009-2011), University of Kentucky College of Medicine
- Dexter Sullivan (2009-2011), Regulatory toxicologist, Gad Consulting
- Chia-Hui Lin (2007-2010), R.N., University of Pikeville
- Sri Kiran Botta (2007-2009), M.B.A., Texas Tech University
- Julie Schuck (2006-2007)

Undergraduate researchers: (Honors student*, Gatton Academy of Math & Science student†)

- Helen William (2015-present)
- John Paul Edoh Abah (2015-present)
- Sanida Palavra (2015-present)
- Steven King (2014-present)
- Madison Heine (2014-present)

- Taylor Billings (2014-present)
- Kyle Weller (2014-present)
- Denis Hodzik* (2014-present)
- Machala Wells* (2013-2014)
- Shelvin Booher (2013-2014)
- Barrett Rogers* (2013-present)
- Victoria Peters (2013-2015)
- Amy Ni* (2011-present)
- Brandon Kerr (2011-2013)
- Mackenzie Perkins* (2011-2013), Master of Public Health candidate, WKU
- Elizabeth Malloy (2011-2012), M.S. candidate, Western Kentucky University
- Savannah Bell (2012), NSF REU Summer research student
- Kyle Hawkins (2010-2012), University of Louisville Medical School
- Ruth Sudbeck* (2010-2011), University of Kentucky College of Medicine
- Alyssa Badinger (2011)
- Amanda Beers*† (2009-2011), Ph.D. candidate, McMaster University
- Bethany Coffey† (2009-2012), Ph.D. candidate, University of Hawaii
- Michael Sullivan (2011), NSF REU Summer research student
- Kaitlin Hartley† (2010)
- Aaron McKee (2010)
- Zachary Laux† (2010)
- Patrick Stewart* (2007-2010), 2009 Recipient of the Udall Scholarship
- Gayatri Bhaskar (2009)
- Nikki Roof† (2008)
- Shubash Sheroa (2006)
- Jyoti Sahi (2006), University of Louisville Dental School
- Amanda Webb* (2006-2009), University of Kentucky College of Medicine
- Brian Rogers* (2006-2010), University of Indiana Optometry School
- Reagan Gilley* (2005-2008), University of Louisville Medical School

TEACHING EXPERIENCE

Assistant Professor, Western Kentucky University, 2005-2010
Associate Professor, Western Kentucky University, 2010-present

- BIO 113 General Biology
- BIO 120 Biological Concepts: Cells, Metabolism, and Genetics
- BIO 120 Winter Web-based Biological Concepts: Cells, Metabolism, and Genetics (personally developed course)
- BIO 120 Honors: Biological Concepts: Cells, Metabolism, and Genetics (modified course)
- BIO 153 Cells and Tissues Biotechnology Core Module
- HON 301 The Genius of China – Its History of Discovery & Invention (personally developed Honors colloquium)

- BIO 335 Neurobiology (personally developed course)
- BIO 675 Advanced Neurobiology (personally developed course)
- BIO 503 Contemporary Research in Biology
- BIO 598 Graduate Seminar
- BIO 475 Principles of Animal Communication (personally developed Web course)
- BIO 545 Principles of Animal Communication (personally developed Web-Graduate course)
- BIO 485 Form and Function in Australian Fauna (*personally developed Study Abroad course)

Instructor, Department of Biology, University of Maryland, 2003-2005

- Introduction to Cellular and Molecular Biology
- Biology of Fishes (personally developed course)

Guest lecturer, Johns Hopkins University-Baltimore, Spring 2005

- Sensory Biology

Teaching Assistant, Depts. of Zoology & Marine Science, Univ. of Texas at Austin, 1996-1999

- Mammalian Anatomy
- Biology of Fishes

Teaching Assistant, Department of Zoology, Brigham Young University, 1994-1996

- Human Physiology
- Appreciation of Nature
- Honors History of Science and Civilization

ACADEMIC SERVICE

Professional Service

2015-present:	Associate Editor, *Frontiers in Cellular Neuroscience*
2013- 2015:	Guest Associate Editor, *Frontiers in Cellular Neuroscience*
2013-present:	Editorial Board, *Science Postprint*

Reviewer for the following journals:

Copeia, The Great Basin Naturalist, The American Midland Naturalist, Environmental Biology of Fishes, Asian Journal of Andrology, Journal of Chemical Ecology, Ethology, Behavioral Ecology and Sociobiology, Aquaculture, Ecology of Freshwater Fishes, Journal of Experimental Marine Biology and Ecology, Marine Ecology Progress Series, Ethology, Electronic Journal of Integrative Biosciences, PLoS ONE, Open Fish Science Journal, The Anatomical Record, Proceedings of the Royal Society B, Royal Society Open Science, and *Hearing Research*

2007- Textbook reviewer: "Biology: Concepts & Connections, Fifth Ed." by Neil A. Campbell, Jane B. Reece, Martha R. Taylor, and Eric J. Simon. Benjamin Cummings, 2006.

2008- Reviewer for the Joint Industry Program (JIP) Exploration & Production (E & P) Sound & Marine Life Program

2012- Textbook reviewer: "Life: The Science of Biology", 10th Edition by Sadava, Hillis, Heller, Berenbaum. W.H. Freeman, 2014.

2014- Reviewer for the Action on Hearing Loss International Project Grant proposals.

Organizational Service

2007	Secretary, Physiology and Biochemistry Section of the Kentucky Academy of Science (KAS)
2008-2009	Chair, Physiology and Biochemistry Section of the KAS
2008- June 2009	Vice-president, Western Kentucky University Chapter of Sigma Xi
June 2009-2012	President, Western Kentucky University Chapter of Sigma Xi

K-12 Service

2000, 2001	Academic judge for Texas Ocean Science Bowl, Texas A&M University
2007, 2009, 2015	Potter Gray Elementary School Science Day, prepared fish bioacoustics presentation and brought live fishes for demonstrations
2009	Potter Gray Elementary School Science Fair Judge
2012, 2014	Potter Gray Elementary School Science Day presenter

WKU Service

2008	Judge for Student oral presentations, 38th Student Research Conference at the Carol Knicely Conference Center, Western Kentucky University
2008	Chemistry 412 Poster presentation judge, Dr. Webb instructor
2008-2013	Honors Graduation & Scholars Banquet support for my Honors students
2009	Judge for Student oral presentations, 39th Student Research Conference at the Carol Knicely Conference Center, Western Kentucky University
2011	WKU Study Abroad Fair, manned table for CCSA (Cooperative Center for Study Abroad)
2011	Judge for student oral presentations, 41st Student Research Conference at Western Kentucky University
2013	Judge for student oral presentations, 43rd Student Research Conference at Western Kentucky University

WKU Committees

- Faculty Senator Representative for Biology, University Senate (Spring 2013-present)
- Ogden College of Science and Engineering Identity Committee (Fall 2013-2014)

- Ogden College of Science and Engineering Graduate Curricular Committee (Fall 2013-present)
- Biology Department Graduate Curriculum Committee Chair (Fall 2013-present)
- WKU University Senate General Education Committee (Fall 2013-2014)
- WKU Honors Development Board (Fall 2012-2015)
- Postdoctoral Research Associate Search Committee Chair, WKU Biology Department (Spring-Summer 2013)
- At-Large Biology Representative to Faculty Senate (Spring 2009-Spring 2013)
- Biostatistics Search Committee Chair (Fall 2010-Spring 2011)
- WKU Student Research Council (Fall 2009-2011), Sigma-Xi Representative
- Biology Advising Committee (Fall 2009-2012), Chair
- Biology Department Head Search Committee Member (Spring 2008 – Summer 2009)
- Biology Summer Undergraduate Research Experience (BSURE) Committee member (2007-present)
- Curriculum Committee, Bioinformatics and Information Science Center (Spring 2006-present)
- Genetics Instructor Search Committee, Biology Department (Summer-Fall 2009)
- Biotechnology Center Coordinator Search Committee Chair (Summer-Fall 2009)
- Postdoctoral Research Associate Search Committee Chair, WKU Biology Department (Summer 2009-2010)
- Biology Department Undergraduate Curriculum Committee (Summer 2009-2012)
- Biotechnology Center Recruitment Committee (Fall 2005-2008)
- *Ad hoc* Biol 120 Committee (Fall 2005-present)
- Pre-professional Advising Committee (Fall 2005-present)