

SUSAN M. SMITH, PH.D.
CURRICULUM VITA

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PROFESSIONAL EXPERIENCE

2016 – **Professor**, David H. Murdoch Nutrition Research Institute & Department of Nutrition, University of North Carolina at Chapel Hill
2016 – **Professor Emeritus**, Dept. Nutritional Sciences, UW-Madison
2004 – 2016 **Professor**, Dept. Nutritional Sciences and Affiliate Faculty, Waisman Center; University of Wisconsin-Madison, Madison WI
1997 – 2004 **Associate Professor**, Dept. Nutritional Sciences, University of Wisconsin-Madison, Madison WI
1990 – 1997 **Assistant Professor**, Dept. Nutritional Sciences, University of Wisconsin-Madison, Madison WI
1987 – 1990 **Postdoctoral Research Fellow**, Dept. Cellular and Molecular Physiology, Harvard Medical School, Boston MA

EDUCATION

1987-1990	Developmental Biol.	Harvard Medical School, Boston MA
1982-1987	Ph.D. Biochemistry	University of Wisconsin-Madison, Madison, WI
1979-1982	B.S. Biochemistry	Purdue University, West Lafayette IN
1978-1979	Chemistry	Western Michigan University, Kalamazoo MI

AWARDS AND PROFESSIONAL ACTIVITIES

2015 – 2017 Vilas Associate, UW-Madison
2014 – present External steering committee, U54 Cooperative Agreement, North Carolina Central University & University of North Carolina
2014 Dannon Institute, Mid-Career Nutrition Leadership Institute, selected participant
2012 Sabbatical release w/R. Tanguay, Oregon State Univ., to learn zebrafish embryology.
2012 James G. Wilson Outstanding Publication Award, Teratology Society
2010-2011 President, Fetal Alcohol Spectrum Disorders Study Group (Vice-President 2009-2010; Secretary/Treasurer 2008-2009)
2008-2011 Expert Witness for GlaxoSmithKline on Paroxetine and Cardiovascular Malformations
2007-2017 Method to Extend Time in Research (MERIT) award, NIAAA (R37 AA11085)
2006, 2008 Chair, FASEB Summer Research Conference on *The Retinoids* (Co-chair, 2006)
2005-2006 Chair, NIH study section NAL (Neurotoxicology & Alcohol).
2004-2014 Associate Editor, *Birth Defects Research: Clinical and Molecular Teratology*
2003-2014 Member, Editorial Board, *Developmental Dynamics*
2002-2010 National Board of Directors, House Rabbit Society (Richmond CA)
2001-2006 Member, NIH study section NAL (former ALTX-3), Neurotoxicology
2001 Organizing Committee, Research Society on Alcoholism Annual Meeting, Montreal

Canada.
 1994-1995 Future Leader in Nutrition Awardee, International Life Sciences Institute
 1988-1990 Research Fellow of the Muscular Dystrophy Association

Ad hoc reviewer for numerous NIH study sections in Nutrition, Alcohol & Alcoholism, Cardiac Development, Craniofacial Development, Neurobiology, Psychopharmacology, Comparative Biology, Developmental Pharmacology, Aging. Reviewer of multiple funding mechanisms including investigator-initiated proposals (R01, R03, R21, K awards), SBIR, pre/postdoctoral fellowships, training grants, conferences (R13), and centers.

Ad hoc reviewer of research proposals for USDA, NSF, American Heart Association, March of Dimes, Hatch formula awards, Israel Science Foundation, Natural Sciences and Engineering Research Council of Canada; Killam Research Fellowships (Canada); Neurological Foundation (New Zealand), Arizona Biomedical Research Commission; Academy of Sciences (Czech Republic)

PROFESSIONAL AFFILIATIONS

Fetal Alcohol Spectrum Disorders Study Group	Teratology Society
Research Society on Alcoholism	Alpha Chi Sigma (professional in chemistry)
American Society for Nutrition	

JOURNAL SERVICE

2004 – 2014 Associate Editor, *Birth Defects Research: Clinical and Molecular Teratology*

2003 – 2014 Editorial Board, *Developmental Dynamics*

Ad Hoc Reviewer:

Nature, Development, Developmental Biology, Alcoholism: Clinical and Experimental Research, Alcohol, Alcohol & Alcoholism, American Journal of Clinical Nutrition, BBA-Lipids; Birth Defects Research A/B/C, Biochemical Pharmacology, Biotechniques, Brain Research, Cardiovascular Toxicology, Cleft Palate-Craniofacial Journal, Developmental Dynamics, Endocrinology, FASEB Journal, Int. J. Developmental Biology, J. Biological Chemistry, J. Cell Biology, J. Cellular Physiology, J. Lipid Research, J. Neurochemistry, J. Neurocytology, J. Neurosciences, J. Nutrition, J. Pediatrics, J. Pharmacology & Experimental Therapeutics, J. Physiology, Matrix Biology, Molecular Pharmacology, Neuropharmacology, Neurotoxicology & Teratology, PLoS ONE, Proceedings for the Society of Experimental Biology and Medicine, Reproductive Toxicology, Toxicology, Toxicology & Applied Pharmacology, Toxicological Sciences

CURRENT AND FUTURE RESEARCH INTERESTS

My research laboratory investigates how dietary agents (broadly defined) affect birth defect risk in the offspring. Our major research line emphasizes alcohol and fetal alcohol spectrum disorder (FASD). FASD is the leading known cause of neurodevelopmental disability. We investigate underlying mechanisms of action and incorporate recent advances in molecular development to establish the molecular and cellular mechanisms by which such agents affect embryogenesis and birth defect risk. Recent work also addresses nutrient interactions with prenatal alcohol exposure (PAE), including effects on fetal requirements and homeostasis, and in later life with respect to eating behaviors and nutrient needs. Our work utilizes diverse animal models including knock-out mice, *in ovo* chick, diet-manipulated rats and mice, and most recently zebrafish. Our clinical work with individuals diagnosed with FASD addresses their nutritional concerns and the impact on chronic disease risk.

Our major research line investigates the mechanism by which alcohol causes a selective apoptosis of neural crest populations that in turn contributes to FASD's unique craniofacial dysmorphology. This work employs an *in ovo* chick embryo model. This is now arguably one of the best understood models of alcohol's neurotoxicity. Our effort has demonstrated that alcohol causes neural crest apoptosis through its direct stimulation of a G protein-coupled receptor and phospholipase C β . In turn these induce an intracellular Ca²⁺ transient that activates CaMKII. The Ca²⁺ and CaMKII initiate apoptosis because they suppress a major developmental pathway, canonical Wnt signaling, through their direct phosphorylation and destabilization of the transcriptional effector β -catenin. β -Catenin is a novel alcohol target and is a critical effector of growth and differentiation in many cell lineages. Our data suggest that β -catenin dysregulation may represent a broader mechanism by which ethanol affects cell fate and function. The first half of my current MERIT established why β -catenin loss is pro-apoptotic. We have identified the transcriptional repressor *snail2* as strongly up-regulated by alcohol. Snail1/2 are central regulators of cell migration, proliferation, and apoptosis. Our data indicate that *Snai2* dysregulation initiates the precocious epithelial-to-mesenchymal transformation (EMT) of premigratory neural crest and thereby triggers their p53-mediated apoptosis, akin to the mechanism operating in tumor suppression and metastasis. Methods to test these hypotheses include chick *in ovo* neural tube electroporation of expression constructs, *in ovo* reporter gene systems, and zebrafish knock-outs and morpholinos.

It is clear from both human data and animal models that alcohol-exposed offspring differ greatly in their alcohol vulnerability and in their FASD phenotype and outcome. We have become quite interested in the factors that modify this vulnerability, both environmental and genetic, as their identification offers insights into FASD risk and prevention. In the second half of my MERIT, we used RNA-Seq to characterize the transcriptomes of two closely-related chick lines having distinct alcohol vulnerability with respect to the calcium transient and apoptosis. We also characterized the neural crest transcriptome 6hrs post-alcohol challenge. Unexpectedly, the KEGG pathway having greatest altered representation in both the genetic ($P=10^{-47}$) and alcohol ($P=10^{-17}$) comparisons was the family of 38-50 ribosomal proteins; all were significantly repressed by alcohol. Importantly, ribosome dysbiogenesis is a sensor of cellular stress and p53-mediated apoptosis, and human ribosomopathies can produce craniofacial deficits akin to FASD. We have translated these findings into our zebrafish FASD model to mechanistically interrogate the contributions of ribosome dysbiogenesis in alcohol vulnerability.

My MERIT award enabled me to initiate new research areas that investigate the contribution of maternal nutrition to FASD vulnerability. In one research line, we use a rat model to study how maternal iron deficiency affects FASD outcome. In collaboration with behavioral neuroscientist T. Tuan, (East Carolina Univ.), we showed that maternal ID profoundly exacerbates several key diagnostics for FASD, including deficits in associative learning, growth, and myelination. We extended this to show the iron status / PAE interaction arises because alcohol perturbs iron homeostasis; in a gestational rat model of PAE, alcohol dysregulates iron metabolism and hepcidin signaling to produce fetal anemia and brain iron-deficiency, possibly through alcohol's inflammatory action. This work has critical clinical importance as clinicians are already testing iron supplements for at-risk pregnancies, and because populations with high FASD rates also have high risk for gestational iron deficiency. A Fogarty proposal in collaboration with T Balachova (U Oklahoma) will look prospectively at iron status and FASD outcome in the Eastern European country of Moldova.

Our recent collaboration with J Wozniak (UMinn) and the Collaborative Initiative on FASD has documented that children with FASD have substantial rates of disordered eating, hyperphagia, and perhaps obesity. My laboratory developed a novel mouse PAE model and uses this to investigate how PAE alters metabolism and appetite in the offspring, using metabolic phenotyping and body composition analysis, in collaboration with CLE Yen (UW). Our preliminary data suggest that PAE may set up the offspring for Type-2 Diabetes and Metabolic Syndrome in later life. These mouse dams have abnormal mammary development and our collaboration with W. Blaner (Columbia U.) looks at milk composition. Through CIFASD and again collaborating with J Wozniak we submitted a pilot proposal to test if FASD similarly alters obesity risk in this clinical population. Potential interactions between nutrition and alcohol

are a RFA priority at NIAAA and we are pleased to be at the forefront of this work.

PATENTS AWARDED

2010 U.S. Patent 7,838,561. "Method for Preventing or Treating Cardiac Hypertrophy." **SM Smith**, GR Flentke, J Lough. This shows that low retinoic acid status delays cardiomyocyte senescence and attenuates hypertrophy responses in response to overload challenge.

PEER-REVIEWED PUBLICATIONS

SUBMITTED / IN PREPARATION

77. Flentke GR, Garic A, Berres ME, **Smith SM**. Acute Alcohol Exposure Induces Snai2 to Suppress Proliferation and Enhance Migration and Apoptosis in Neural Crest Progenitors. (in preparation)
76. Berres ME, Garic A, **Smith SM**. Transcriptome Profiling Identifies Ribosome Biogenesis as a Target of Alcohol Teratogenicity and Vulnerability during Early Embryogenesis. (submitted)
75. Garic A, Flentke GR, Hernandez M, **Smith SM**. Calmodulin Signals Originating from Gαq Govern Hindbrain Neural Crest Survival by Controlling the Expression of *Snail2*, *Bmp4* and *Msx2*. (in revision)
74. Flentke GR, Hacker TA, Bauer C, Wendler CC, Whitesell L, Abouelleil M, Springstroh B, Lough J, **Smith SM**. Retinol Binding Protein-4 (RBP-4) Promotes Cardiac Hypertrophy through the GSK3β/GATA4 Signaling Pathway. (in revision)

PUBLISHED

73. Huebner SM, Blohowiak SE, Kling PJ, **Smith SM**. 2016. Prenatal alcohol exposure alters fetal iron distribution and elevates hepatic hepcidin in a rat model of fetal alcohol spectrum disorders. *J. Nutrition* 146:1180-1188. PMC4877631
72. Amos-Kroohs R, Fink B, Smith CJ, Van Calcar SC, Wozniak JR, **Smith SM**. 2016 Significantly dysregulated eating behavior and hyperphagia in children with prenatal alcohol exposure. *J Pediatrics* 169:194-200. PMC4729627
71. Huebner SM, Tran TD, Rufer ES, **Smith SM**. 2015. Maternal iron deficiency synergizes with alcohol to reduce associative learning and its neurocircuitry in a rat model of Fetal Alcohol Spectrum Disorders. *Alcohol Clin Exp Res* 39:2097-1107. PMC4624509
70. **Smith SM**, Garic A, Flentke GR, Berres ME. 2014. Neural crest development in fetal alcohol syndrome. *Birth Defects Res C Embryo Today*. 102:210-220. PMC4827602
69. **Smith SM**, Garic A, Berres ME, Flentke GR. 2014. Genomic factors that shape craniofacial outcome and neural crest vulnerability in FASD. *Front Genet*. 5:224. PMC4124534
68. Garic A, Berres ME, **Smith SM**. 2014. High-Throughput Transcriptome Sequencing Identifies Candidate Genetic Modifiers of Vulnerability to Fetal Alcohol Spectrum Disorders. *Alcohol Clin Exp Res*. 38:1874-1882. PMC4124534
67. Bolnick J, Karana R, Chiang P, Kilburn B, Romero R, Diamond M, **Smith SM**, Armant DR. 2014. Apoptosis of alcohol-exposed human placental cytotrophoblast cells is downstream of intracellular calcium signaling. *Alcohol Clin Exp Res*. 38:1646-1653. PMC4049269
66. Flentke GR, Klingler RH, Tanguay RL, Carvan MJ^{3rd}, **Smith SM**. 2014. An evolutionarily-conserved mechanism of calcium-dependent neurotoxicity in a zebrafish model of FASD *Alcohol Clin Exp Res*. 38:1255-1265. PMC3999225
65. Flentke GR, Garic A, Hernandez M, **Smith SM**. 2014. CaMKII represses transcriptionally-active β-catenin to mediate acute ethanol neurodegeneration and can phosphorylate β-catenin. *J Neurochem* 128:523-535. PMC3946158
64. Werts RL, Van Calcar SC, Wargowski DS, **Smith SM**. 2013. Inappropriate feeding behaviors and

- dietary intakes in children with FASD or probably PAE. *Alcohol Clin Exp Res*. 38:871-878. PMC3959629
63. Rufer ES, Tran TD, Attridge MM, Andrzejewski ME, **Smith SM**. 2012. Adequacy of maternal iron status protects against behavioral, neuroanatomical and growth deficits in Fetal Alcohol Spectrum Disorders. *PLoS One*. 7(10):e47499. PMC3477151
 62. Palmer JA, Poenitzsch AM, **Smith SM**, West PR, Cezar GG. 2012. Metabolic biomarkers of prenatal alcohol exposure. *Alcohol Clin Exp Res* 36: 1314-1324. PMC3374055
 61. **Smith SM**, Flentke GR, Garic A. 2012. Avian Models in Teratology and Developmental Toxicology. In: *Methods in Molecular Biology*, v.889: *Developmental Toxicology*. Ed. C. Harris, JM Hansen. Humana Press, Totowa NJ. pp 85-103. PMC4560095
 60. Garic A, Flentke GR, Amberger E, Hernandez M, **Smith SM**. 2011. CaMKII activation is a novel effector of alcohol's neurotoxicity in neural crest stem/progenitor cells. *J Neurochem* 118:646-657. PMC3137720
 59. Flentke GR, Garic A, Amberger E, Hernandez M, **Smith SM**. 2011. The Calcium-Mediated Repression of β -Catenin and Its Transcriptional Signaling Mediates Neural Crest Cell Death in an Avian Model of Fetal Alcohol Syndrome. *Birth Defects Res. A* 91:591-602. PMC4827605 Winner of James G. Wilson Outstanding Publication Award for 2012 from the Teratology Society.
 58. Kane CJ, **Smith SM**, Miranda R. 2012. Proceedings of the 2010 Annual Meeting of the FASD Study Group. *Alcohol* 46:107-114. PMC3258329
 57. Zhou F, Kane CJ, **Smith SM**. 2012. Proceedings of the 2009 Annual Meeting of the FASD Study Group. *Alcohol* 46:101-105. PMC3645502
 56. **Smith SM**, Flentke GR, Kragtorp KA, Tessmer T. 2010. Ethanol Exposure during the Early First Trimester Equivalent Impairs Reflexive Motor Activity and Heightens Fearfulness in an Avian Model. *Alcohol* 45:57-63. PMC3011049
 55. Rufer ES, Hacker TA, Flentke GR, Drake VJ, Brody MJ, Lough J, **Smith SM**. 2010. Altered cardiac function and ventricular septal defect in avian embryos exposed to low-dose trichloroethylene. *Toxicol. Sci.* 113:444-452. PMC2807037
 54. **Smith SM**. 2010. Environmentally-induced heart malformations. In: *Comprehensive Toxicology 2nd Edition*. (Charlene McQueen). Oxford: Elsevier. 229-445.
 53. **Smith SM**. 2010. Ethanol and Cell Death. In: *Comprehensive Toxicology 2nd Edition*. (Charlene McQueen). Oxford: Elsevier. 223-238.
 52. Garic-Stankovic A, Hernandez M, Flentke GR, Zile M, **Smith SM**. 2008. A Ryanodine Receptor-Dependent Ca_i^{2+} Asymmetry at Hensen's Node Mediates Avian Lateral Identity. *Development* 135:3271-3280. PMC2999519
 51. **Smith SM**. 2008. The avian embryo in fetal alcohol research. In: *Alcohol: Methods and Protocols*, L. Nagy, editor. Methods Mol Biol. 447:75-84. PMID: 18369912
 50. Wolff GS, Chiang PJ, **Smith SM**, Romero R, Armant DR. 2007. EGF-like growth factors prevent apoptosis of alcohol-exposed human placental cytotrophoblast cells. *Biol Reprod.* 77:53-60. PMC1950777
 49. Drake VJ, Koprowski SL, Hu N, **Smith SM**, Lough JW. 2006. Cardiogenic effects of trichloroethylene and trichloroacetic acid following exposure during heart specification of avian development. *Toxicol. Sci.* 94:153-162. PMID: 16917067
 48. Drake VJ, Koprowski SL, Hu N, Lough JW, **Smith SM**. 2006. Trichloroethylene exposure during cardiac valvuloseptal morphogenesis alters cushion formation and cardiac hemodynamics in the avian embryo. *Env. Health Perspect.* 114:842-847. PMC1480523
 47. Garic-Stankovic A, Hernandez M, Flentke GR, **Smith SM**. 2006. Structural constraints for alcohol-stimulated Ca^{2+} release in neural crest, and dual agonist/antagonist properties of *n*-octanol. *Alcohol Clin Exp Res* 30:552-559. PMID: 16499497
 46. Drake VJ, Koprowski SL, Lough JW, **Smith SM**. 2006. The gastrulating chick embryo as a model for evaluating teratogenicity: a comparison of three approaches. *Birth Defects Res A* 76:66-71.

- PMID: 16333841
45. Kilburn BA, Chiang PJ, Wang J, Flentke GR, **Smith SM**, Armant DR. 2006. Rapid induction of apoptosis in gastrulating mouse embryos by ethanol and its prevention by HB-EGF. *Alcohol Clin Exp Res* 30:127-134. PMC1679959
 44. **Smith SM**, Debelak-Kragtorp KA. 2006. Neural crest and alcohol exposure. In: *The Developing Brain: Lessons Learned from Alcohol and Nicotine Exposures*. M.W. Miller, editor. New York: Oxford University Press. Pages 279-294.
 43. Garic-Stankovic A., Hernandez MA, Flentke GR, Debelak-Kragtorp KA, Armant DR, **Smith SM**. 2005. Ethanol triggers neural crest apoptosis thru the selective activation of a pertussis toxin-sensitive G-protein and a phospholipase C β -dependent Ca²⁺ transient. *Alcohol Clin Exp Res* 29:1237-1246. PMID: 16046880
 42. Desai, T, Malpel S, Flentke GR, **Smith SM**, Cardoso WV. 2004. Retinoic acid signaling is essential for FGF10 expression and respiratory tract morphogenesis in the developing foregut. *Dev Biol* 273:402-415. PMID: 15328022
 41. Flentke GR, Baker MW, Docterman KE, Power S, Lough J, **Smith SM**. 2004. Microarray analysis of retinoid-dependent gene activity during rat embryogenesis: increased collagen fibril production in a model of retinoid insufficiency. *Dev Dyn* 229:886-898. PMID: 15042712
 40. Wendler CC, Schmoldt A, Flentke GR, Case LC, Quadro L, Blaner WS, Lough J, **Smith SM**. 2003. Increased fibronectin deposition in embryonic hearts of retinol-binding protein-null mice. *Circ Res* 92:920-928. PMC3752713
 39. Debelak-Kragtorp KA, Armant DR, **Smith SM**. 2003. Ethanol-induced cephalic apoptosis requires phospholipase C-dependent intracellular calcium signaling. *Alcohol Clin Exp Res* 27:515-523. PMID: 12658119
 38. Lin M, Zhang M, Abraham M, **Smith SM**, Napoli JL. 2003. Mouse RALDH4: molecular cloning, cellular expression, and activity in 9-*cis*-retinoic acid biosynthesis in intact cells. *J. Biol. Chem.* 278:9856-9861. PMID: 12519776
 37. Thackaberry EA, Bedrick EJ, Goens MB, Danielson L, Lund AK, Gabaldon D, **Smith SM**, Walker MK. 2003. Insulin regulation in AhR-null mice: embryonic cardiac enlargement, neonatal macrosomia, and altered insulin regulation and response in pregnant and aging AhR-null females. *Toxicol Sci* 76:407-417. PMID: 12970579
 36. Thackaberry EA, Gabaldon DM, Walker MK, **Smith SM**. 2002. Aryl hydrocarbon receptor null mice develop cardiac hypertrophy and increased hypoxia inducible factor-1 in the absence of cardiac hypoxia. *Cardiovasc Tox* 2:263-273. PMID: 12665660
 35. Docterman KE, **Smith SM**. 2002. Of *Meis* and men: lessons from a microarray study of teratogen action. *Teratology* 66:217-223.
 34. Zhang M, Chen W, **Smith SM**, Napoli JL. 2001. Molecular characterization of mouse retinol dehydrogenase type 1 (RDH1): a rate-limiting enzyme of all-*trans*-retinoic acid synthesis *in vivo*. *J Biol Chem* 276:44083-44090. PMID: 11562362
 33. Catron T, Mendiola MA, **Smith SM**, Born J, Walker MK. 2001. Hypoxia regulates avian cardiac Arnt and HIF-1 α mRNA expression. *Biochem Biophys Res Comm* 282:602-607. PMID:11401503
 32. Su B, Debelak KA, Tessmer LA, Cartwright MM, **Smith SM**. 2001. Genetic influences on craniofacial outcome in an avian model of prenatal alcohol exposure. *Alcohol Clin Exp Res.* 25:60-69. PMID: 11198716
 31. Walker MK, Heid SE, **Smith SM**, Swanson H. 2000. Molecular characterization and developmental expression of the chicken aryl hydrocarbon receptor. *Comp Biochem Physiol Part C* 126:305-319. PMID: 11048681
 30. Debelak KA, **Smith SM**. 2000. Avian genetic background modulates the neural crest apoptosis induced by ethanol exposure. *Alcohol Clin Exp Res* 24:307-314. PMID: 10776667
 29. Cavieres MF, **Smith SM**. 2000. Genetic and developmental modulation of cardiac deficits in prenatal alcohol exposure. *Alcohol Clin Exp Res* 24:102-109. PMID: 10656199

28. Power SC, Lancman J, **Smith SM**. 1999. Conditional retinoid deficiency demonstrates RA participates in limb outgrowth but not in limb bud initiation or positional identity. *Dev Dynamics* 216:469-480. PMID: 10633866
27. **Smith SM**. 1997. Alcohol-induced cell death in the embryo. *Alc. Health Res. World* 21:287-297. PMID: 15706739
26. Barron M, McAllister D, **Smith SM**, Lough J. 1998. Expression of vitamin A transport proteins during early embryogenesis: a possible role in heart development. *Dev Dynamics* 212:413-422. PMID: 9671945
25. Cartwright MM, Tessmer LA, **Smith SM**. 1998. Ethanol-induced neural crest apoptosis is coincident with their endogenous death but is mechanistically distinct. *Alcohol Clin Exp Res*. 22:142-149. PMID: 9514299
24. Young WJ1, Lee YF, **Smith SM**, Chang C. 1998. A bidirectional regulation between the TR2/TR4 orphan receptors (TR2/TR4) and the ciliary neurotrophic factor (CNTF) signaling pathway. *J Biol Chem*. 273:20877-20885. PMID: 9694834
23. Ruiz-Lozano P, **Smith SM**, Perkins G, Kubalak SW, Boss GR, Sucov HM, Evans RM, Chien KR. 1998. Energy deprivation and a deficiency in downstream metabolic target genes during the onset of embryonic heart failure in RXR α $-/-$ embryos. *Development* 125:533-544. PMID: 9425147
22. **Smith SM**, Dickman ED, Power SC, Lancman J. 1998. Retinoids and their receptors in vertebrate embryogenesis. *J Nutr* 128:467S-470S. PMID: 9478050
21. **Smith SM**, Dickman ED. 1997. New insights into retinoid signaling in cardiac development. *Trends Cardiovasc Med* 7:53-58. PMID: 21235904
20. Dickman ED, Thaller C, **Smith SM**. 1997. Temporally-regulated retinoic acid depletion produces specific neural crest, ocular, and nervous system defects. *Development* 124:3111-3121. PMID: 9272952
19. Walker MK, Pollenz RS, **Smith SM**. 1997. Expression of the aryl hydrocarbon receptor (Ahr) and AhR nuclear translocator during cardiac septal morphogenesis correlates with dioxin-induced cardiac malformations during embryogenesis. *Tox Appl Pharm* 143:407-419. PMID: 9144457
18. **Smith SM**, Dickman ED, Thompson RP, Sinning A, Wunsch AM, Markwald RR. 1997. Retinoic acid directs cardiac laterality and expression of early markers of cardiogenesis. *Dev Biol* 182:162-171. PMID: 9073458
17. **Smith SM**, MM Cartwright. 1997. Spatial visualization of apoptosis using a whole mount in situ DNA end-labeling technique. *Biotechniques* 22:832-834. PMID: 9149856
16. Young WJ, **Smith SM**, Chang C. 1997. Induction of the ciliary neurotrophic factor receptor (CNTFR α) gene by the TR4 orphan receptor. *J Biol Chem* 272:3109-3316. PMID:9006963
15. Dickman ED, **Smith SM**. 1996. Selective regulation of cardiomyocyte gene expression and cardiac morphogenesis by retinoic acid. *Dev Dynamics* 206:39-48. PMID:9019245
14. Cartwright MM, **Smith SM**. 1995. Stage dependent effects of ethanol on cranial neural crest cell development: partial basis for the phenotypic variations observed in Fetal Alcohol Syndrome. *Alcohol Clin Exp Res* 19:1454-1462. PMID: 8749810
13. Cartwright MM, **Smith SM**. 1995. Increased cell death and reduced neural crest cell numbers in ethanol-exposed embryos. *Alcohol Clin Exp Res* 19:378-386. PMID: 7625573
12. Ney DM, Yang H, **Smith SM**, Unterman TG. 1995. High-calorie total parenteral nutrition reduces hepatic insulin-like growth factor-1 (IGF-1) mRNA and alters serum levels of IGF-binding protein-1, -3, -5, and -6 in the rat. *Metabolism* 44:152-60. PMID: 7532778
11. **Smith SM**, Kirstein IJ, Wang ZS, Fallon JF, Kelly J, Bradshaw-Rouse J. 1995. Differential expression of retinoic acid receptor- β isoforms during chick limb ontogeny. *Dev Dynamics* 202:54-66. PMID: 7703521
10. **Smith SM**. 1994. The retinoic acid receptor isoform β 2 is an early marker for alimentary tract and central nervous system positional specification in the chicken. *Dev Dynamics* 200:14-25. PMID: 8081011

9. **Smith SM**. 1993. Participation of retinoic acid and its receptors during chick embryogenesis. In: *Limb Development and Regeneration, part B*. J. Fallon et al., eds. New York:Wiley. 781-791.
8. Eichele G, Thaller C, **Smith SM**. 1993. Recent advances in the biology of retinoids. In: *The Molecular and Cellular Biology of the Bone*. M. Noda, ed. Orlando:Academic Press. 287-319.
7. **Smith SM**, Eichele G. 1991. Temporal and regional differences in the expression pattern of distinct retinoic acid receptor- β transcripts in the chick embryo. *Development* 111:245-252. PMID:1849811
6. Thaller C, **Smith SM**, Eichele G. 1991. Retinoids in vertebrate development: pattern formation in limbs and in the central nervous system. In: *Retinoids: 10 Years On*. J-H. Saurat, ed. Basel:Karger. 89-108.
5. **Smith SM**, Pang K, Sundin O, Wedden SE, Thaller T, Eichele G. 1989. Molecular approaches to vertebrate limb morphogenesis. *Development* 107 (suppl.):121-131. PMID: 2576867
4. Carman JA, **Smith SM**, Hayes CE. 1989. Characterization of a helper T lymphocyte defect in vitamin A-deficient mice. *J Immunol* 142:388-393. PMID: 2463304
3. **Smith SM**, Hayes CE. 1987. Contrasting impairments in IgM and IgG responses of vitamin A-deficient mice. *Proc Natl Acad Sci USA*. 84:5878-5882. PMC298966
2. **Smith SM**, Levy NS, Hayes CE. 1987. Impaired immunity in vitamin A-deficient mice. *J Nutr* 117:857-865. PMID: 3495650
1. Mehansho H, Clements S, Sheares BT, **Smith SM**, Carlson DM. 1985. Induction of proline-rich glyco- protein synthesis in mouse salivary glands by isoproterenol and by tannins. *J Biol Chem* 260:4418-4423. PMID: 3980484

RESEARCH SUPPORT

Current Support

32. Vilas Associate Award from UW Chancellor's Office. "Does Alcohol Exposure in Pregnancy Increase Obesity Risk in Adulthood?" 7/1/15 – 6/30/17. \$12,500 (ADC) Uses mouse FASD model to quantify glucose metabolism, body composition, and metabolic profile in alcohol-exposed offspring.
31. NIAAA, 2 R37 AA11085. SM Smith, PI. "Craniofacial Morphogenesis in Prenatal Alcohol Exposure." 4/1/07 – 3/31/17. \$210,000 (ADC) Identify contribution of ethanol-induced Ca^{2+} transient to the modulation of Wnt-mediated signaling and apoptosis in neural crest. This is a MERIT award from NIAAA.
30. NIAAA, 1 R01 AA22999. SM Smith, PI. "Prenatal Alcohol Exposure Disrupts Maternal-Fetal Iron Metabolism in FASD" 6/1/14 – 5/31/19. \$225,000 (ADC) Investigate how prenatal alcohol exposure disrupts maternal-fetal iron homeostasis; identify clinical strategies to enhance maternal and fetal iron status in PAE.

Previous Support

29. NIAAA, F32 AA21311 S Huebner, PI. "Prenatal Alcohol Exposure Dysregulates Fetal Iron Homeostasis" 4/01/12 – 3/31/15. Postdoctoral fellowship to Dr. Shane Huebner to study how prenatal alcohol exposure alters iron homeostasis in the pregnant rat dam and fetus. Dr. Smith mentored Dr. Huebner in her laboratory.
28. Hatch, MSN130919. SM Smith, PI. "Iron Homeostasis in Alcohol-Exposed Pregnancy." 10/01/10 – 9/30/14. \$23,000 (ADC) Evaluates iron transport and delivery mechanisms in the pregnant rat and fetus following chronic binge exposure to clinically relevant oral ethanol intakes. Ascertains if alcohol disrupts placental iron transport, and determines if maternal iron supplements benefit the alcohol-exposed offspring.
27. NIAAA, R21-AA17281. SM Smith, PI; T Tran, co-I (East Carolina University). "Is Maternal Iron Status a Risk Factor in Fetal Alcohol Syndrome?" 4/01/09 – 9/30/12. \$150,000 (ADC). Evaluated maternal iron status as a modifier of pathological and behavioral outcome in a rat model of chronic binge alcohol exposure.

26. UW-Madison/UW-Milwaukee Intercampus Grants Program. SM Smith, PI. "Zebrafish Neurotoxicity Model for Fetal Alcohol Syndrome" 06/01/2011 – 05/31/2012. \$50,000 (\$33,246 to Smith) Performed pilot studies w/M Carvan (UWM) to develop a zebrafish model to study alcohol's effects on brain development.
25. NIAAA, ARRA Stimulus supplement to AA11085. SM Smith, P.I. "High-throughput Sequencing of Genes Modifying Ethanol Sensitivity." 9/1/2010 - 8/31/2011. \$50,000. Performed RNA-Seq to identify gene expression and SNP changes in related chick strains differing in their ethanol sensitivity.
24. NIAAA, R21 AA16958. GG Cezar, PI. "Biochemical Pathways & Biomarkers of Alcohol Injury in Early Human Development." 06/01/08 – 5/31/10. \$150,000. Collaboration to characterize the metabolome in ethanol-exposed human ES cultures and hES-derived neurons, to identify biomarkers that inform injury mechanism and have potential diagnostic value. Smith was co-investigator.
23. USDA NRI, 2008-35200-04446. SM Smith, PI. "14th Biennial FASEB Summer Research Conference on *The Retinoids*." 04/01/08 – 03/31/09. \$10,000. Supports the biennial conference held June 15-20, 2008 at New Haven, CT. Dr. Smith was the Conference Organizer.
22. NIDDK, R13 DK081216. SM Smith, PI. "14th Biennial FASEB Summer Research Conference on *The Retinoids*." 04/01/08 – 03/31/09. \$24,000. Supports the biennial conference held June 15-20, 2008 at New Haven, CT. Dr. Smith was the Conference Organizer.
21. March of Dimes Birth Defects Foundation. SM Smith, PI. "14th Biennial FASEB Summer Research Conference on *The Retinoids*." 04/01/08 – 03/31/09. \$5000. Supports the biennial conference held June 15-20, 2008 at New Haven, CT. Dr. Smith was the Conference Organizer.
20. American Heart Association. SM Smith, PI. "14th Biennial FASEB Summer Research Conference on *The Retinoids*." 04/01/08 – 03/31/09. \$2500. Supports this biennial conference held June 15-20, 2008 at New Haven, CT. Dr. Smith was the Conference Organizer.
19. Palmer Fund/UW Waisman Institute. SM Smith, PI. Do Maternal, Subclinical Nutrient Deficiencies Enhance the Damage Caused by Prenatal Alcohol Exposure? 07/01/08 – 6/30/10. \$14,000. Pilot study to determine if maternal iron deficiency worsens the behavioral and morphological damage caused by developmental alcohol exposure.
18. American Heart Association #0650037Z. SM Smith, PI. "Suppression of Cardiac Hypertrophy by Retinoid Insufficiency" 1/1/06 – 12/31/07. \$60,000 TDC. Examines retinoid action on the process of cardiac hypertrophy in an adult mouse model.
17. NIAAA, R01 AA11085-06-11. SM Smith, PI. "Craniofacial Morphogenesis in Prenatal Alcohol Exposure." 4/1/01 – 3/31/07. Identify contribution of ethanol-induced Ca²⁺ transient to the modulation of Wnt-mediated signaling and apoptosis in neural crest.
16. NIEHS, R01 ES11738. J Lough PI, SM Smith, Co-PI. "Risk and Molecular Mechanism of TRI Cardiac Teratogenesis." 9/1/01 – 8/31/07. \$404,652 TDC. Determine how the groundwater contaminant trichloroethylene (TRI) disrupts early cardiac development, using mouse and chick embryo models.
15. NIHLB, R01 HL61911 J Lough, PI, SM Smith, co-I. "Retinol Binding Protein and Heart Development." 11/1/01-7/31/05. \$150,000 TDC. Characterized at cellular and molecular levels the early cardiac malformation identified in RBP null-mutant mice that are null-mutant for RBP.
14. NIAAA, R01-AA12057. DR Armant, PI, SM Smith, co-I. "Alcohol-Induced Apoptosis in Embryonic Development." 10/01/99-9/30/02. \$48,384 TDC. Determines whether proximal pathways activated by alcohol exposure are shared by preimplantation and gastrulation-stage mouse embryos, and whether these two stages are differentially programmed in their response.
13. NIAAA, R29 AA11085. SM Smith, PI. "Craniofacial Morphogenesis in Prenatal Alcohol Exposure." 7/1/96-6/30/01. \$350,000 TDC. Identifies the mechanism responsible for alcohol-induced neural crest cell death and ethanol's impact on the regenerative capacity of this population.
12. National March of Dimes Birth Defects Foundation, #1-FY98-0402. SM Smith, PI. "Molecular Basis for the Craniofacial Dysmorphology Caused by Prenatal Alcohol Exposure." 6/1/98-5/31/00.

- \$110,000 TDC. Develops cephalometric measures to assess craniofacial development following prenatal alcohol exposure, and examine facial primordia outgrowth to identify gene signals responsible for ethanol's morphological effects, particularly the sonic hedgehog signaling family.
11. NIEHS, P30 ES09090. "Developmental Toxicology", C Jefcoate, PI. SM Smith, Director of Microanatomy Facility Service Core. 4/1/98-3/31/02. \$2-million TDC; Smith portion \$220,000 TDC. Center Grant supported core facilities, outreach and administration for R01-driven research into Developmental Toxicology.
 10. Hatch/College of Ag. & Life Sciences. "Identification of Retinoid-Dependent Genes during Embryogenesis." SM Smith, PI. 10/1/99-9/30/03. \$100,000 TDC. Identify candidate transcriptional targets of retinoids in embryos thru construction & screening of subtractive cDNA libraries.
 9. NHLBI, #BH953016. "Cardiac Valvuloseptal Morphogenesis" RR Markwald, PI; SM Smith, co-I. 9/1/94-8/31/99. \$150,000 TDC. Study retinoid functions in heart septation and outflow tract formation, examine molecular consequences of retinoid deficiency and toxicity to cardiogenesis.
 8. Hatch/College of Ag. & Life Sciences, #3363. SM Smith, PI. "The Requirement for a Vitamin A Gradient in Vertebrate Limb Development." 10/1/95-9/30/99. \$25,000 annual direct costs. Define retinoid roles in limb development by manipulating its gradient via targeted disruption of retinoid metabolic enzymes.
 7. National March of Dimes Birth Defects Foundation, #1-FY96-0915. SM Smith, PI. "Craniofacial Morphogenesis in Prenatal Alcohol Exposure." 7/1/96-6/31/00. \$110,000 TDC. Mechanism of ethanol-induced neural crest cell death and its impact upon neural crest regeneration.
 6. American Heart Association, Wisconsin affiliate, # 96-GB-77. SM Smith, PI. "Molecular Mechanism of Dioxin-Induced Cardiovascular Malformations during Vertebrate Development." \$60,000 TDC. 7/1/96-6/30/99. Identified cellular targets of dioxin during cardiogenesis and identified target genes of dioxin receptors in normal development and after prenatal dioxin exposure.
 5. International Life Sciences Institute, Future Leaders in Nutrition Award. SM Smith, PI. "The role of vitamin A in the development of the embryonic heart." \$30,000/two years. 1/1/94 - 12/31/95. Developed rat model of conditional gestational vitamin A deficiency to study retinoid roles in embryogenesis.
 4. USDA Competitive Grants Program, #9404376. "Roles for retinoic acid receptors in chicken limb development." SM Smith, PI. \$165,000 TDC. 9/15/94 - 9/14/96. Identified contributions of retinoids and their receptors to limb morphogenesis.
 3. Hatch/College of Agricultural and Life Sciences, UW-Madison. SM Smith, PI. "Characterization of retinoic acid receptors that govern formation of the chick embryo limb bud." #3453. \$111,254 TDC. 3/15/91-9/30/95. Identified contributions of retinoids and their receptors to limb morphogenesis.
 2. USDA Competitive Grants Program, #3658. SM Smith, PI. "Characterization of the retinoic acid receptors that govern formation of the chick embryo limb bud." \$220,000 TDC. 9/1/91 - 8/31/94. Identified contributions of retinoids and their receptors to limb morphogenesis.
 1. Muscular Dystrophy Association, postdoctoral fellowship to SM Smith. "Expression of the retinoic acid morphogen receptor in embryonic chick limb bud." Gregor Eichele, sponsor. \$49,000 TDC. 7/1/88 - 6/30/90. Identified contributions of retinoids and their receptors to limb morphogenesis.

ABSTRACTS AND NON-REFEREED PUBLICATIONS

- 2016 Berres ME, Garic A, Flentke GR, Smith SM. Transcriptome profiling and morpholino knockdown identifies ribosome biogenesis as a novel alcohol target during early neurogenesis. Research Society on Alcoholism. New Orleans, LA.
- 2016 Flentke GR, Garic A, Berres ME, Smith SM. Acute alcohol exposure induces Snai2 to suppress proliferation and enhance migration and apoptosis in neural crest progenitors. Research Society on Alcoholism. New Orleans, LA.
- 2016 Amos-Kroohs RM, Nelson DW, Yen CLE, Smith SM. Metabolic Phenotype and Increased

- Adiposity in a Mouse Model of Chronic Gestational Alcohol Exposure. *Experimental Biology*. San Diego CA.
- 2016 Amos-Kroohs RM, Cheng AA, Clugston RD, Huang TN, Blaner WS, Yen CLE, Smith SM. Mammary Gland Structure and Functional Changes in Mouse Model of Chronic Gestational Alcohol Exposure. *Experimental Biology*. San Diego CA. Maternal, Perinatal and Pediatric Research Interest Section of the ASN. *American Society of Nutrition, Maternal, Perinatal and Pediatric RIS Emerging Leaders, Poster Award Recipient*.
- 2016 Cheng AA, Huebner SM, Blohowiak SE, Pamela J. Kling PJ, Smith SM. High Maternal Iron Diet During Prenatal Alcohol Exposure (PAE) May Normalize Iron Homeostasis in PAE Fetuses. *Experimental Biology*. San Diego CA. *American Society of Nutrition, Vitamins and Minerals RIS Emerging Leaders, Poster Award Recipient*.
- 2015 Amos-Kroohs RM, L Cheng, BA Fink, Van Calcar SC, Wozniak JR, Smith SM. Disordered eating behaviors and nutritional issues in children with FASD. Research Society on Alcoholism. San Antonio TX.
- 2015 Amos-Kroohs RM, Nelson DW, Yen CLE, Smith SM. Metabolic assessment and obesity risk in a novel mouse model of chronic gestational alcohol exposure. Research Society on Alcoholism. San Antonio TX.
- 2015 Huebner SM, Blohowiak SE, Kling PJ, Smith SM. Gestational alcohol exposure impairs fetal hematological values independent of iron deficiency. Research Society on Alcoholism. San Antonio TX.
- 2015 Garic A, Berres ME, Smith SM. Transcriptome profiling and characterization of exonal expressions in gene targets associated with alcohol sensitivity in FASD. Research Society on Alcoholism, San Antonio TX.
- 2015 Huebner SM, Tran TD, Rufer ES, Smith SM. Maternal iron deficiency synergizes with prenatal alcohol to reduce associative learning and its neurocircuitry in a rat model of FASD. Research Society on Alcoholism, San Antonio TX.
- 2015 Smith S.M., Amos-Kroohs R, Cheng L, Fink BA, Van Calcar SC, Wozniak JR. Disordered eating behaviors and nutritional issues in children with Fetal Alcohol Spectrum Disorders. *Experimental Biology*. Boston MA.
- 2015 Huebner S, Smith SM. Gestational alcohol exposure impairs maternal-fetal iron homeostasis through hepcidin dysregulation. *Experimental Biology*. Boston MA.
- 2014 Huebner SM, Drew PA, Smith SM. Gestational alcohol exposure dysregulates fetal brain iron homeostasis under maternal iron sufficiency and deficiency. Society for Neuroscience. Washington, D.C.
- 2014 Smith SM, Fink BA, Van Calcar SC, Wozniak JR. Disordered eating behaviors and nutritional issues in children with FASD. Research Society on Alcoholism. Bellevue WA.
- 2014 Garic A, Berres ME, Smith SM. High-throughput transcriptome sequencing identifies candidate genetic modifiers of vulnerability to Fetal Alcohol Spectrum Disorders. Research Society on Alcoholism. Bellevue WA
- 2013 Abazi J, Smith SM, Huebner SM. Maternal iron status alters the pro-inflammatory action of gestational alcohol exposure. Research Society on Alcoholism. Orlando FL
- 2013 Garic A, Berres ME, Smith SM. High-throughput transcriptome sequencing in early neural progenitors identifies candidate genes that modify sensitivity to alcohol's neurotoxicity. Research Society on Alcoholism. Research Society on Alcoholism. Orlando FL
- 2013 Flentke GR, Klingler RH, Tanguay RL, Carvan MJ 3rd, Smith SM. An evolutionarily conserved mechanism of calcium-dependent neurotoxicity in an early zebrafish model of FASD. Research Society on Alcoholism. Orlando FL.
- 2012 Garic A, Berres ME, Smith SM. High-throughput transcriptome sequencing to identify genetic modifiers of sensitivity to alcohol. Research Society on Alcoholism. San Francisco CA.

- 2012 Huebner S, Steeber B, Smith SM. Prenatal alcohol exposure disrupts iron homeostasis in a rat model of FAS. Research Society on Alcoholism. San Francisco CA.
- 2011 Garic A, Berres ME, Smith SM. High-throughput transcriptome sequencing to identify genetic modifiers of sensitivity to alcohol. NIDA/NIAAA. Mini-convention on Genetics and Epigenetics of Substance Abuse. Washington DC, Sept 2011.
- 2011 Smith SM, Flentke GR, Garic A, Amberger E, Hernandez M. β -Catenin destabilization by calcium and CaMKII mediates neural crest apoptosis in an FASD model. Research Society on Alcoholism. Atlanta GA
- 2011 Tran T, Lloyd DH, Conchar ID, Sheffer EM, Smith SM. Maternal iron deficiency produces differential learning outcomes and cell loss in a rat model of FASD. Research Society on Alcoholism. Atlanta GA
- 2011 Palmer JA, Poenitzsch AM, Smith SM, Cezar GG. Identifying biomarkers of fetal alcohol exposure using metabolomics and derivatives of human embryonic stem cells. Research Society on Alcoholism. Atlanta GA
- 2011 Smith SM, Rufer ES, Tran TD, Attridge MM, Andrzejewski ME, Flentke GR. Maternal iron status is a critical modulator of neurotoxicity and learning outcomes in a rat model of FAS. International BioIron Society Meeting. Vancouver BC. May 2011.
- 2010 Eggenberger SE, Rufer E, Feit EC, McKee BL, Paletz EM, Smith SM, Andrzejewski. Motivational and attentional deficits in a rat model of fetal alcohol syndrome. Association for Behavior Analysis International. San Antonio TX. March 2010.
- 2010 Rufer ES, Tran TD, Attridge MM, Andrzejewski ME, Smith SM. Subclinical maternal iron deficiency exacerbates associative learning in a rat model of FASD. Research Society on Alcoholism. San Antonio TX. June 2010.
- 2010 Smith SM, Garic-Stankovic A, Hernandez M, Flentke GR. β -Catenin destabilization by calcium and CaMKII mediates neural crest apoptosis in an FASD model. Research Society on Alcoholism. San Antonio TX. June 2010.
- 2009 Rufer ES, Tran T, Smith SM. 2009. Moderate maternal iron inadequacy worsens neurobehavioral outcomes in a rat model of developmental ethanol exposure. Research Society on Alcoholism annual meeting, San Diego CA. June 2009.
- 2009 Smith SM, Garic-Stankovic A, Hernandez M, Flentke GR. 2009. Calcium-dependent repression of β -catenin instigates ethanol-induced apoptosis of neural crest. San Diego CA, June 2008.
- 2008 Garic-Stankovic A, Hernandez M, Flentke GR, Smith SM. 2008. Ethanol causes neural crest apoptosis through the Ca_i^{2+} mediated repression of nuclear β -catenin. Washington DC, June 2008.
- 2008 Flentke GR, Hacker T, Lough J, Smith SM. Hypertrophy attenuation by retinoids is via inhibition of GSK3 β /GATA4 signaling. UW Cardiovascular Research Center poster fair. December 2008.
- 2008 Rufer ES, Tran T, Smith SM. 2008. Moderate maternal iron inadequacy worsens neurobehavioral outcomes in a rat model of developmental ethanol exposure. International Society for Developmental Psychobiology, Washington DC, November 2008.
- 2008 Rufer ES, Tran T, Smith SM. 2008. Moderate maternal iron inadequacy worsens neurobehavioral outcomes in a rat model of developmental ethanol exposure. Research Society on Alcoholism annual meeting, Washington DC, June 2008. (ESR was a Gordis Awardee of RSA)
- 2008 Garic-Stankovic A, Hernandez M, Flentke GR, Smith SM. 2008. A ryanodine receptor-dependent Ca_i^{2+} asymmetry at Hensen's node mediates avian lateral identity. FASEB SRC on The Retinoids, New Haven, CT.
- 2008 Garic-Stankovic A, Hernandez M, Smith SM. 2008. Ethanol is apoptotic to neural crest because it aberrantly activates signals that normally govern neural crest apoptosis. Society of Toxicology annual meeting, Seattle, WA.
- 2008 Rufer ES, Tran T, Smith SM. 2008. Moderate maternal iron inadequacy worsens neurobehavioral outcomes in a rat model of developmental ethanol exposure. Society of Toxicology annual meeting, Seattle, WA.

- 2008 Worawong C, Lauver DR, Smith SM. A nutrition intervention focused on goals of Thai pregnant women. Midwest Nursing Research Society Conference. Indianapolis IN, March 2008.
- 2007 Rufer E, Lough J, Smith SM. Disruption of a heart development by trichloroethylene, a common groundwater contaminant. Weinstein Cardiovascular Development Meeting. Indianapolis, May 2007.
- 2007 Armant DR, Romero R, Smith SM, Leach RE. The EGF signaling system and trophoblast survival. Internatl Federation of Placental Assn. Kingston ON, Aug 07
- 2007 Rufer ES, Tran T, Smith SM. 2007. Maternal iron inadequacy enhances neurobehavioral deficits caused by ethanol to the offspring. Research Society on Alcoholism annual meeting. Chicago, IL.
- 2007 Garic-Stankovic A, Hernandez M, Smith SM. 2007. Ethanol is neurotoxic to neural crest because it activates the PLC/CaMKII-dependent endogenous cell death pathway. Research Society on Alcoholism annual meeting. Chicago, IL.
- 2006 Flentke GR, Lough J, Hacker T, Bauer C, Smith SM. 2006. Novel roles for retinoids and RBP in adult heart. FASEB Conference on "The Retinoids." Indian Wells, CA.
- 2006 Drake VJ, Lough J, Hu N, Smith SM. 2006. Environmentally-relevant trichloroethylene exposure alters cardiac hemodynamics during avian development. Society of Toxicology. San Diego, CA.
- 2005 Smith, SM, Flentke GR, Hacker TA, Schmoldt A, Springstroh B, Wendler C, Lough J. 2005. Deficiency in retinol binding protein (RBP) reveals a novel retinoid function in cardiac hypertrophy. Keystone Conference on Cardiac Hypertrophy and Disease. Steamboat Springs, CO.
- 2005 Drake VJ, Koprowski S, Lough J, Smith SM. 2005. Disruption of a heart development by trichloroethylene, a common groundwater contaminant. Weinstein Cardiovascular Development Meeting. Tucson AZ.
- 2005 Drake VJ, Koprowski S, Lough J, Smith SM. 2005. Alteration of normal heart development by trichloroethylene and its metabolite trichloroacetic acid. Society of Toxicology, New Orleans LA.
- 2005 Gilliam D, Smith S. 2005. Preconception and prenatal exposure to ethanol: effects on fetal facial morphology in mice. A preliminary report. Regional Meeting of Colorado-Wyoming Academy of Science.
- 2004 Garic-Stankovic A, Hernandez M, Kragtorp-Debelak KA, Armant DR, Smith SM. 2004. Phospholipase C signaling in ethanol-induced apoptosis during early embryo development. Research Society on Alcoholism. Vancouver BC, Canada. June 2004.
- 2004 Kragtorp-Debelak KA, Moyers M, Garic-Stankovic A, Smith SM. 2004. Cell death and developmental timing are critical determinants of facial dysmorphology in the chick model of prenatal alcohol exposure. Research Society on Alcoholism. Vancouver, BC, Canada.
- 2004 Garic-Stankovic A, Hernandez M, Kragtorp-Debelak KA, Armant DR, Smith SM. 2004. Phospholipase signaling in ethanol-induced apoptosis during early embryo development. Teratology Society, Vancouver, BC, Canada.
- 2004 Kragtorp-Debelak KA, Moyers M, Garic-Stankovic A, Smith SM. 2004. Cell death and developmental timing are critical determinants of facial dysmorphology in the chick model of prenatal alcohol exposure. Teratology Society. Vancouver, BC, Canada.
- 2004 Drake VJ, Koprowski S, Lough J, Smith SM. 2004. Disruption of heart development by trichloroethylene, a common groundwater contaminant. Teratology Society, Vancouver, BC, Canada.
- 2004 Smith, SM, KA Docterman, MW Baker, GR Flentke. 2004. Microarray approaches to identify retinoid-responsive genes in embryogenesis: increased collagen fibril production in a model of retinoid insufficiency. Teratology Society. Vancouver, BC, Canada.
- 2004 Lough J, Wendler CC, Hacker T, Flentke GR, Blaner WS, Smith SM. 2004. Increased fibronectin deposition and concomitant echocardiographic deficits in hearts of retinol-binding protein null mice. Weinstein Cardiovascular Development Meeting. Boston MA.
- 2004 Smith SM, G Flentke, CC Wendler, A Schmoldt, J Lough. 2004. Hypertrophy & diastolic cardiac dysfunction in a genetic model of subclinical vitamin A deficiency. UW Cardiovascular Research

- Center poster fair.
- 2003 Smith SM, Flentke GR, Baker M, Lough J, Wendler CC, Schmoldt A, Case L, Blaner WS. 2003. Altered myocardial differentiation and increased matrix deposition in retinol binding protein-null mice. UW Cardiovascular Research Center poster fair.
- 2003 Smith SM, Docterman KA, Baker MW, Flentke GR. Microarray approaches to identify retinoid-responsive genes in embryogenesis. Minisymposium on "Vitamin A and Retinoids." FASEB J. EB 2003, San Diego CA.
- 2003 Smith, SM, Su B, Flentke GR, Debelak KA, Tessmer LA, Hahn SH. Prenatal alcohol exposure represses *sonic hedgehog* signaling during craniofacial morphogenesis. Minisymposium on "Cell Signaling during the Development of Craniofacial Tissues." FASEB J. EB 2003, San Diego CA.
- 2003 Thackeberry EA, Goens B, Gabaldon D, Smith SM, Walker MK. 2003. Embryonic cardiac hypertrophy and neonatal macrosomia is dependent on AhR maternal genotype. FASEB J. Experimental Biology, San Diego, CA.
- 2003 Wendler CC, Smith SM, Case L, Quadro L, Blaner WS, Lough. 2003. Heart development in retinol-binding protein null embryos. FASEB J. Experimental Biology, San Diego CA.
- 2002 Smith SM, G Flentke, M Baker, J Lough, CC Wendler, A Schmoldt, L Case, WS Blaner. Altered myocardial differentiation and increased matrix deposition in retinol binding protein-null mice. UW Cardiovascular Research Center poster fair. Madison, WI
- 2002 Smith, SM, Flentke GR, Baker M, Lough J, Wendler CC. 2002. Altered myocardial differentiation and increased matrix deposition in retinol binding protein-null mice. FASEB Conference on *The Retinoids*. Tucson AZ
- 2002 Docterman KE, Smith SM. 2002. Microarrays to identify retinoid-dependent transcripts in vitamin A-deficient embryos. FASEB Conference on *The Retinoids*. Tucson AZ
- 2001 Kilburn BA, Smith SM, Rappolee DA, Armant DR. 2001. Ethanol rapidly induces apoptosis of mouse embryonic cells at the preimplantation and gastrulation stages. Research Society on Alcoholism. Montreal, Canada.
- 2001 Debelak KA, Armant DR, Smith SM. 2001. An intracellular calcium transient after ethanol exposure mediates apoptosis in neural crest cells. Research Society on Alcoholism. Montreal, Canada.
- 2001 Smith SM, Su B, Tessmer LA, Debelak KA, Flentke GR, Hahn SH. 2001. Prenatal alcohol exposure redirects sonic hedgehog signaling during craniofacial morphogenesis. Research Society on Alcoholism. Montreal, Canada.
- 2000 Thackaberry EA, MK Walker, SM Smith. Null mutation of the aryl hydrocarbon receptor activates cardiac hypoxic signaling pathways during early embryogenesis. Society on Toxicology annual meeting, San Francisco CA.
- 1999 Cavieres, M.F. Smith SM. 1999. Genetic and gestational modulation of cardiac defects in prenatal alcohol exposure. NIEHS Center for Developmental Toxicology, Symposium on Developmental Toxicology. Madison, WI.
- 1999 Power S, Lancman JL, Smith SM. 1999. Retinoids are required for limb bud outgrowth but not initiation in a model of targeted gestational retinoid deficiency. NIEHS Center for Developmental Toxicology, Symposium on Developmental Toxicology. Madison, WI.
- 1999 Thackaberry EA, Walker MK, Walker MK, Smith SM. 1999. Accelerated cardiomyocyte differentiation and aberrant hypoxia-mediated signaling in the Ah Receptor null mutant mouse. Society of Toxicology Annual Meeting.
- 1999 Debelak KA, Smith SM. 1999. Susceptibility to ethanol-induced neuronal apoptosis is influenced by genetic background. Research Society on Alcoholism Annual Meeting. Santa Barbara, CA.
- 1999 Smith SM, Tessmer LA, Su B, Cartwright MM. 1999. Fetal genetic background modulates sonic hedgehog signaling and craniofacial sensitivity following prenatal alcohol exposure. Research Society on Alcoholism Annual Meeting. Santa Barbara, CA.
- 1999 Smith SM, Ruiz-Lozano P, Dickman ED, Boss GR, Chien KR. 1999. Retinoic acid is required for cardiomyocyte differentiation and energetics. Weinstein Cardiovascular Development Mtg, Tucson AZ.

- 1999 Thackaberry, EA, Walker MK, Walker MK, Smith SM. 1999. Accelerated cardiomyocyte differentiation and aberrant hypoxia-mediated signaling in the Ah Receptor null mutant mouse. Weinstein Cardiovascular Development Meeting, Tucson AZ.
- 1999 Walker MK, Smith SM. 1999. Altered conduction signals and impaired Na/K/ATPase function in an in ovo model of prenatal TCDD (dioxin) exposure. Weinstein Cardiovascular Development Meeting, Tucson AZ.
- 1997 Dickman ED, Smith SM. 1997. Retinoids are required for myocardial energetics and differentiation in the early fetal heart. Weinstein Cardiovascular Development Meeting, Cincinnati, OH.
- 1996 Dickman ED, Smith SM. 1996. A vitamin A-deficiency model to study the retinoid requirement during early rat cardiogenesis. FASEB J. Experimental Biology, Washington, D.C.
- 1996 Smith SM, Cartwright MM. 1996. Craniofacial development following prenatal alcohol exposure. Gordon Research Conference, *Alcohol*, Ventura CA.
- 1995 Dickman ED, Smith SM. 1995. Selective regulation of cardiomyocyte gene expression and cardiac morphogenesis by retinoic acid. Weinstein Cardiovascular Development Conference, Rochester, NY.
- 1995 Walker MK, RS. Pollenz, Smith SM. 1995. Differential expression of two basic helix-loop-helix proteins, aryl hydrocarbon receptor (AhR) and AhR nuclear translocator (ARNT) in myocardium during chick cardiogenesis. Weinstein Cardiovascular Development Conference, Rochester, NY.
- 1995 Walker MK, R. Pollenz, Smith SM. 1995. Temporal and spatial expression of the Arylhydrocarbon Receptor (AHR) and Arylhydrocarbon Receptor Nuclear Translocation (ARNT) proteins during chick cardiogenesis. Seventh International Congress of Toxicology. Seattle, WA.
- 1995 Smith SM, Kirstein IJ, Wang ZS, Kelley J, Fallon JF, Bradshaw-Rouse J. 1995. Differential expression of retinoic acid receptor- β isoforms during chick limb ontogeny. FASEB J. A552. Experimental Biology, Atlanta, GA.
- 1995 Dickman ED, Smith SM. Selective regulation of cardiomyocyte gene expression and cardiac morphogenesis by retinoic acid. FASEB J A828. Experimental Biology, Atlanta, GA.
- 1995 Cartwright MM, Smith SM. Effects of ethanol on cranial neural crest cell derivatives: abnormal cranial nerve development in Fetal Alcohol Syndrome. FASEB J. A763, Experimental Biology, Atlanta, GA
- 1994 Smith SM, Kirstein IJ, Wang ZS, Kelley J, Fallon JF, Bradshaw-Rouse J. 1994. Differential expression of retinoic acid receptor- β isoforms during chick limb ontogeny. American Society of Cell Biology, San Francisco, CA
- 1994 Smith SM, Kirstein IJ, Wang ZS, Kelley J, Fallon JF, Bradshaw-Rouse J. 1994. Differential expression of retinoic acid receptor- β isoforms during chick limb ontogeny. Society for Developmental Biology, Madison, WI
- 1994 Cartwright MM, Smith SM. 1994. Effects of ethanol on cranial neural crest cells: evidence of selective elimination by ethanol-induced apoptosis. Society for Developmental Biology, Madison, WI
- 1994 Cartwright MM, Smith SM. 1994. Effects of ethanol on cranial neural crest cells: evidence of selective elimination by ethanol-induced apoptosis. FASEB J.
- 1993 Smith SM. 1993. Participation of retinoic acid and its receptors during chick embryogenesis. in: *Limb Development and Regeneration, part B*. JF Fallon *et al.*, eds. New York:Wiley. 781-791.
- 1993 Eichele G, Thaller C, Smith SM. 1993. Recent advances in the biology of retinoids. in: *The Molecular and Cellular Biology of the Bone*. M. Noda, ed. Orlando: Academic Press. 287-319.
- 1992 Smith SM, Hahn H, Dickman ED. 1992. Spatiotemporal regulation of retinoic acid receptor-beta (gRAR- β) transcripts and protein in chick embryogenesis. FASEB Journal. 6: A1659.
- 1991 Thaller C, Smith SM, Eichele G. 1991. Retinoids in vertebrate development: pattern formation in limbs and in the central nervous system. in: *Retinoids: Ten Years On*. J-H. Saurat, ed. Basel:Karger. 89-108.
- 1990 Smith SM, Eichele G. 1990. Retinoic acid receptor expression in the embryonic chick. J. Cell. Biochem. Suppl. 14E, 113.

INVITED PRESENTATIONS

- 2016 “Molecular Basis for Fetal Alcohol Syndrome and its Modification by Genes and Diet.” Children’s National Medical Center. George Washington University School of Medicine. Washington, D.C. April 2016

- 2016 “How do Genetics and Maternal Nutrition Affect Fetal Vulnerability to Alcohol?” North Carolina Central University. Durham, NC. April 2016.
- 2016 Invited speaker, “Patterns of Disordered Eating in Individuals with FASD”. 7th National Biennial Conference on Adolescents and Adults with Fetal Alcohol Spectrum Disorders. Vancouver, BC, Canada. April 2016
- 2015 Invited speaker, symposium on “The Calcium Signaling Toolkit: Integrators and Targets of Alcohol.” Proposed for 2015 RSA annual meeting, San Antonio TX.
- 2015 Symposium organizer, “Nutritional Mechanisms in the Prevention and Treatment of Fetal Alcohol Spectrum Disorders.” w/Sandra Mooney. Proposed for 2015 RSA annual meeting, San Antonio TX
- 2015 Invited speaker for symposium, “Moderate Alcohol Use and Nutrition in the Context of Chronic Diseases: What We Know and Where to Go.” N. Parekh, organizer. American Society for Nutrition, 2015 Annual Meeting. Boston MA. April 2015
- 2015 Invited speaker, “Prenatal alcohol exposure – Nutrient and genetic interactions that affect FASD risk.” Department of Nutrition, University of North Carolina at Chapel Hill. April 2015.
- 2015 Invited speaker, “Nutrition & Development in FASD” 6th International Conference on FASD. Vancouver BC. March 2015
- 2015 Plenary Speaker “Food, Toxicants, and Perinatal Influences: Why So Challenging?” 2015 Children’s Environmental Health Network conference “Children: Food and Environment” Austin TX. Feb 2015
- 2015 Invited speaker, “Fundamentals of Nutrition & Disease in Domestic Rabbits”, Wisconsin Exotic Animal Veterinary Conference. Madison WI. February 2015.
- 2014 Invited speaker, “Rabbit Nutrition in Health & Disease”, House Rabbit Society National Education Conference (CME credit for veterinary professionals). St. Louis, MO. September 2014
- 2014 Invited speaker, “Prenatal alcohol exposure – Nutrient and genetic interactions that affect FASD risk.” Institute for Nutrition Research, Kannapolis NC. February 2014.
- 2014 Invited speaker, 3rd USA Science and Engineering Festival. April 21, 2014. Washington, D.C. Public lecture on developmental biology & diseases organized by the Society for Developmental Biology.
- 2013 Chair & co-organizer for Symposium “Nutrition and FASD”, with J. Thomas. Other speakers were C. Chambers (UCSD) & B. Christie (UBC). Research Society on Alcoholism annual mtg. June 2013, Orlando FL.
- 2013 Invited speaker, “Maternal iron status modifies iron metabolism and developmental outcomes in FASD.” Research Society on Alcoholism annual mtg. June 2013, Orlando FL.
- 2012 Plenary speaker, James G. Wilson Publication Award. “The Calcium-Mediated Repression of β -Catenin and Its Transcriptional Signaling Mediates Neural Crest Cell Death in an Avian Model of Fetal Alcohol Syndrome.” Teratology Society annual meeting, Baltimore MD, June 2012.
- 2012 Invited speaker, “Finding Hope: Current Science and Research Trends in FASD.” National Conference on Alcoholism and Drug Dependence – Rochester area. Rochester, NY. April 2012.
- 2011 Expert speaker “Animal Models of FASD: Defining the Pathologies that Inform Behavior.” ICC-FASD Conference “Recognizing ARND in Primary Health Care of Children.” Bethesda, MD. Oct/Nov 2012.
- 2011 Organizer and Chair for Symposium “GSK3 β , β -catenin, and Wnt Signals as Novel Targets of Ethanol’s Action.” Other speakers are J Callaci (Loyola Univ.), U. Heberlein (UCSF), J. Luo (U. Kentucky). Research Society on Alcoholism Annual Meeting, Atlanta, GA. June 2011.
- 2011 Invited speaker, “Ethanol’s suppression of β -catenin mediates the apoptosis of neural crest progenitors in the early embryo.” Research Society on Alcoholism Annual Meeting, Atlanta, GA. June 2011.
- 2011 Substance Abuse and Mental Health Services Administration (SAMSHA) FASD Center for Excellence. Building FASD State Systems Conference. Invited speaker, “Finding Hope: Current Science and Research Trends in FASD.” Phoenix AZ, May 2011.
- 2011 National FASD Conference “Improving Outcomes for Patients with FASD.” American Family Insurance Natl Headquarters. Roundtable Panelist “Translating Current Research to Clinical Practice.”
- 2011 University of Kentucky, School of Medicine, Dept. Nutritional Sciences. “Genetic and Nutritional Modifiers of FASD Outcome.” Graduate seminar series. April 2011.
- 2010 Master Class Invited Lecturer, “Rabbit Nutrition.” National House Rabbit Society Headquarters, Richmond CA. Nov 2010. This 80min lecture is available on DVD.
- 2010 University of Minnesota, School of Medicine, Dept. Psychiatry. “Environmental and Genetic Factors

- that Mediator FASD Outcome.” FASD graduate seminar series sponsored by UMinn and Minnesota NOFAS. October 2010.
- 2010 Organizer and Chair for Symposium “Nutritional Modifiers of FASD.” Other speakers were C. Chambers (UCSD), J. Napoli (UC-Berkeley), J. Thomas (SDSU). Research Society on Alcoholism Annual Meeting, San Antonio, TX. June 2010.
- 2010 Invited speaker, “Maternal Iron Status as a Modifier of FASD Outcome.” Research Society on Alcoholism Annual Meeting, San Antonio, TX. June 2010.
- 2010 FASEB Conference on “The Retinoids.” Scottsdale, AZ. Invited speaker. “Retinoic acid mediation of embryo laterality.” Also session chair on “Retinoid Homeostasis.”
- 2009 Loyola University School of Medicine, Dept of Cell Biology, Neurobiology & Anatomy and Alcohol Research Program. Graduate seminar speaker “Your Baby’s Brain on Booze: How Do Calcium Signaling & β -Catenin Mediate Ethanol’s Neurotoxicity?”
- 2009 National FASD Conference, American Family Insurance Natl Headquarters. Roundtable Panelist “Overview of FASD Research at UW-Madison.” Madison WI
- 2008 FASD Study Group Annual Meeting. Invited Speaker. “Moderate Maternal Iron Inadequacy worsens Neurobehavior Outcomes in a Rat Model of Developmental Alcohol Exposure.” Research Society on Alcoholism Annual Meeting, Washington, D.C. June 2008
- 2008 University of Minnesota, Department of Pharmacology. “Your Baby on Alcohol: Unraveling the Cell Biology of Alcohol’s Neurotoxicity.” Graduate seminar series. Minneapolis, MN.
- 2008 FASEB Conference on “The Retinoids.” Conference Organizer. New Haven, CT.
- 2008 National FASD Conference “Improving Outcomes for Patients with FASD.” American Family Insurance Natl Headquarters. Roundtable Panelist “What’s New in FASD Research?” Madison WI
- 2006 University of Arizona, Department of Pharmacology. Tucson, AZ.
- 2006 University of New Mexico, Department of Pharmacology & Toxicological Sciences. Albuquerque NM.
- 2006 University of Arkansas Medical Sciences Center, Department of Neuroscience. Little Rock, AK.
- 2006 FASEB Conference on “The Retinoids.” Co-organizer; session chair for “Retinoids in Development”; speaker on “Physiological Actions of Retinoids.” Indian Wells, CA.
- 2005 Research Society on Alcoholism Annual Meeting. Platform session on “Neuronal Migration and Alcohol.” “Ethanol and Neural Crest Cell Migration.” Santa Barbara CA.
- 2005 Continuing Veterinary Medical Education Conference on Rabbit Medicine. Invited speaker on “Nutritional Excellence for Domestic Rabbits.” St. Louis MO.
- 2004 FASEB Conference on “The Retinoids.” “A novel role for RBP and retinoids in adult cardiac function.” Calloway Gardens GA. Also Chair for session on “Retinoids in Growth and Development.”
- 2004 Research Society on Alcoholism Annual Meeting. Platform session on “Apoptosis.” “Phospholipase C Signaling in Ethanol-induced Apoptosis during Early Embryo Development.” Vancouver BC, Canada.
- 2004 Fetal Alcohol Study Group annual meeting. “Ethanol selectively triggers neural crest apoptosis through its activation of a pertussis-toxin-sensitive G protein and a phospholipase C-beta-dependent Ca^{2+} transient.” Vancouver BC, Canada.
- 2004 Fetal Alcohol Study Group annual meeting. Kragtorp-Debelak KA, Moyers M, Garic-Stankovic A, Smith SM. “The contribution of neural crest losses to facial outcome in a chick model of prenatal alcohol exposure.” Vancouver BC, Canada.
- 2004 Teratology Society Annual Meeting. “Phospholipase signaling in ethanol-induced apoptosis during early embryo development.” Vancouver, BC, Canada.
- 2004 Teratology Society Annual Meeting. “Cell death and developmental timing are critical determinants of facial dysmorphology in the chick model of prenatal alcohol exposure.” Vancouver, BC, Canada.
- 2004 Teratology Society. “Disruption of a heart development by trichloroethylene, a common groundwater contaminant.” Vancouver, BC, Canada.
- 2004 Teratology Society. “Microarray approaches to identify retinoid-responsive genes in embryogenesis: increased collagen fibril production in a model of retinoid insufficiency.” Vancouver, BC, Canada.
- 2003 Rutgers University, Dept. Animal Sciences Graduate Seminar. Invited speaker on “Calcium Signaling as a Mediator of Apoptosis in Fetal Alcohol Syndrome.” New Brunswick, NJ.
- 2003 University of North Carolina, Bowles Center for Alcohol Studies. Invited seminar: “Roles for PLC-Mediated Calcium Transients and Sonic Hedgehog Signals in Alcohol-Induced Fetal Damage.” Chapel

- Hill, NC.
- 2003 Experimental Biology. "Prenatal alcohol exposure represses *sonic hedgehog* signaling during craniofacial morphogenesis." Minisymposium on "Cell Signaling during Development of Craniofacial Tissues." San Diego, CA.
- 2003 Experimental Biology. "Microarray approaches to identify retinoid-responsive genes in embryogenesis." Minisymposium on "Vitamin A and Retinoids." San Diego, CA.
- 2003 Medical College of Wisconsin, Guest lecture on "Retinoids & Vision" for graduate course on Vision.
- 2003 Medical College of Wisconsin, Dept. Anatomy, Cell Biology & Neurobiology. Invited seminar: "Roles for PLC-Mediated Calcium Transients and Sonic Hedgehog Signals in Alcohol-Induced Fetal Damage." Waukesha WI.
- 2002 Univ. California at Davis. Invited Seminar, Depts. Nutritional Sciences and Toxicology. "Retinoids, Alcohol, and their Roles in Normal Development."
- 2002 Session / Symposium Co-Organizer, "Modulators of Alcohol Effects on the Fetus." Research Society on Alcoholism. (w/M Charness) San Francisco CA
- 2002 Boston University School of Medicine, Dept. Medicine & Pathology. Invited seminar: "Retinoid control of cardiac morphogenesis during embryonic development." Boston MA.
- 2002 SUNY-Upstate Medical University, Dept. Neuroscience & Physiology. "Mechanism of neural crest apoptosis in Fetal Alcohol Syndrome: Roles for Calcium Signaling and Sonic Hedgehog." Syracuse NY
- 2002 UW-Madison, Waisman Center on Developmental Disabilities. Invited seminar: "Mechanism of neural crest apoptosis in Fetal Alcohol Syndrome: Roles for Calcium Signaling and Sonic Hedgehog" Madison, WI.
- 2002 Friends of the Waisman Center. Featured research speaker for annual meeting. "How Alcohol Damages the Developing Embryo." Madison, WI.
- 2001 Texas A&M University, Department of Medicine. College Station, TX.
- 2001 Wayne State University, Department of Obstetrics & Gynecology. Detroit, MI.
- 2001 Organizer & speaker, poster break-out session, Research Society on Alcoholism. Montreal, Canada.
- 2000 Gordon Conference on "Mechanisms of Toxicology," session on "Developmental Toxicology."
- 2000 Session Chair for "Retinoids & Development", "The Retinoids" FASEB Research Conference, Copper Mountain
- 2000 Columbia University Medical School, Department of Biochemistry Seminar Series. New York NY.
- 1999 University of Nebraska Medical School, Department of Anatomy Seminar Series. Omaha NE.
- 1999 Thomas Jefferson University, Department of Anatomy & Cell Biology Seminar Series. Philadelphia PA.
- 1999 Research Society on Alcoholism Annual Meeting, "Alcohol & Neuronal Cell Death" session, Santa Barbara CA.
- 1999 Medical University of South Carolina, Cell Biology & Anatomy Seminar Series. Charleston, SC.
- 1999 University of South Florida, Department of Cell Biology & Anatomy Seminar Series. Tampa, FL.
- 1998 NICHD/NCCR Workshop, "Embryonic Stem Cell: Future Directions." Madison, WI.
- 1998 University of Wisconsin, Endocrinology/Reproductive Physiology Seminar Series. Madison, WI.
- 1998 Session Chair for "Retinoids & Development", "The Retinoids" FASEB Research Conference, Copper Mountain CO.
- 1997 University of California at San Diego, Department of Cardiology. San Diego, CA.
- 1997 University of Wisconsin, Department of Nutritional Sciences Seminar Series. Madison, WI.
- 1996 Iowa State University, Department of Biochemistry Seminar Series. Ames, IA.
- 1996 Research Society on Alcoholism Annual Meeting, Symposium with Fetal Alcohol Syndrome Study Group on "Craniofacial Contributions." Washington, D.C.
- 1996 "The Retinoids" FASEB Research Conference, Copper Mountain CO, "Retinoids & Development."
- 1995 University of Wisconsin, Primate Research Center Seminar Series. Madison, WI.
- 1995 University of Wisconsin, Department of Anatomy Seminar Series. Madison, WI.
- 1995 Fourth Annual Perinatal Substance Abuse Conference: Issues and Strategies for the Future. Speaker on Fetal Alcohol Syndrome. Madison, WI.
- 1995 International Life Sciences Foundation Annual Meeting, North America Future Leader in Nutrition awardee, Cancun, Mexico.
- 1994 University of Wisconsin, Environmental Toxicology Seminar Series.

- 1994 Steroid Receptor Superfamily Symposium, University of Wisconsin-Madison.
 1994 “The Retinoids” FASEB Research Conference, Saxton’s River, VT
 1993 University of Wisconsin, Department of Zoology Seminar Series. Madison, WI.
 1993 Medical University of South Carolina, Cell Biology & Anatomy Seminar Series.
 1993 Fourteenth Symposium on Clinical Nutrition. Milwaukee, Wisconsin. Symposium on “Nutrient Regulation of Gene Expression.”
 1993 University College of Wales, Dept. Biological Sciences Seminar Series. Aberystwyth, Wales, U.K.
 1993 National Institutes for Medical Research, Genes and Cellular Controls Seminar Series. Mill Hill, London, U.K.
 1993 Oxford University, Department of Anatomy Seminar Series. Oxford, UK.
 1993 University of Wisconsin, Endocrinology/Reproductive Physiology Seminar Series. Madison, WI.
 1992 Medical College of Milwaukee, Department of Cell Biology and Anatomy Seminar Series. Milwaukee.
 1990 Johns Hopkins School of Medicine, Wilmer Eye Institute Seminar Series. Baltimore, MD.
 1990 Cornell University Medical School, Department of Biochemistry Seminar Series. New York, NY.
 1990 The Royal Netherlands Academy of Arts and Sciences, Academy Colloquium on “Retinoids in Development and Cancer.” Amsterdam, The Netherlands.
 1989 Symposium sponsored by Hoffmann-LaRoche on “Retinoids and Teratogenesis: Molecular Mechanisms and Approaches.” White Plains, NY.

FORMAL TEACHING RESPONSIBILITY (ALL AT UW-MADISON)

Biochemistry/Nutritional Sciences 510, *Biochemical Principles of Human and Animal Nutrition*

Lead instructor. I presented ~30-45 lectures each Fall on intermediary metabolism, micronutrient function, and ancillary topics (exercise nutrition, CVD, nutraceuticals & supplements, etc.). Enrollment averaged 65-110 students, 85% undergraduate seniors (premedical, biochemistry, dietetics) and 15% graduate students (nutrition, food science, biochemistry, animal science, dairy science). 1991 to 2015

Nutritional Sciences 627, *The Vitamins*

Lead instructor. This is a core course (1 cr) for nutrition and related graduate students. It covers biochemistry and physiology of vitamin roles in humans. I taught the B vitamins, vitamin C, vitamins E and K; guest lectures present vitamins A, D and carotenoids. Enrollment averages 15-22 students. Spring, odd years 2005 to 2015. In 2015 I taught this in a “flipped classroom” format to emphasize student-led learning.

Nutritional Sciences 881, *Human Emphasis Group Seminar*

This is the graduate seminar for nutrition students in our Human Emphasis research group. As head of this emphasis group I served as lead instructor, identifying the semester's topic and providing constructive feedback to the student presentations, and recruit additional instructors. Our goals are to develop speaking skills, critical thinking, and expand nutrition knowledge. Recent topics included microbiome, epigenetics, nutritional supplements, and inflammatory diseases of gut. Enrollment averages 10-18 students. Spring 2011 to 2016.

Nutritional Sciences 500, *Capstone Seminar in Dietetics and Nutrition*

This undergraduate seminar teaches critical thinking and oral presentation skills to Dietetics seniors, as part of the ADA learning criteria. Students select a primary, peer-reviewed paper of their choosing and learn to: read the primary literature, write an abstract, present a research method, and summarize the paper in an oral presentation. 33 students. Spring 2012.

Nutritional Sciences 799, *Practicum in Teaching*

Teaching assistants for NS510 were mentored to develop their classroom teaching skills including methods of student learning, exam writing, and handling classroom problems, in a direct experiential format. 1992-2015.

Nutritional Sciences 623, *The Minerals*

Lead instructor. This core course (1 cr) for nutrition and related graduate students covered biochemistry and

physiology of minerals in humans. I covered Iodine, zinc, Na/Cl/K, and toxicity and organized the course after a faculty departure. 21 students, Spring 2003.

Guest Lectures in Courses

Toxicology 626, *Toxicology of Organ Systems*. I present two lectures on Principles of Teratology and evaluate students on this material. Spring, 1999-2013.

Nutr Sci 875, *Vitamin A: From Molecules to Man*. This course surveys a range of nutritional concepts and techniques using vitamin A as a model. I provided a lecture on transgenic / knockout mouse technologies, how they are used, and how we interpret the data. Fall, Odd Years, 2003-2011.

Nutr Sci 132, *Introduction to Nutrition*. This popular nutrition course is for non-majors and enrolls ~800 students/semester. I presented a pair of guest lectures on Alcohol. Fall/Spring 2000 – 2009

Inter-LS 150, *Ways of Knowing*. Select faculty lead talented biology freshmen in a bi-weekly structured discussion on how science & experimentation are conducted. Fall 1995.

Environmental Toxicology 800, *Current Research in Environmental Toxicology* Co-organized seminar series in Environmental Toxicology. Fall/Spring 1998-1999.

Occasional lectures in Human Oncology (steroid receptors), Zoology (Advanced Development Biology), Pharmacology (retinoid signaling), Nutrition through the Life Cycle (folate & NTDs), Inter-LS/Inter-HE 111 (Alcohol: Behavior, Culture, Science)

GRADUATE MENTOR TEACHING

Graduate trainer in Nutritional Sciences, Molecular and Environmental Toxicology, Cellular and Molecular Biology, Molecular Biosciences, Developmental Biology, MD/PhD, Health Disparities Research Scholars. Current mentees:

Dr. Robyn Amos-Kroohs – PhD in neurobehavioral toxicology, Univ. Cincinnati (F32 submitted)

Dr. Shane Huebner – PhD in Nutritional Sciences, Univ. Wisconsin-Madison (supported by F32 - NIAAA)

Ms. Adrienne Cheng – MPH in Environmental Toxicology, Univ. Michigan

Master's Students

Lisa Muskavitch, MS, RD – Registered Dietitian, Aurora IL

Joseph Lancman, MS, PhD – Sanford-Burnham Medical Research Institute, La Jolla CA

M. Fernanda Cavieres, MS, PhD – faculty in Pharmacy, University of Valparaiso, Chile

Doctoral Students

Eileen Dickman, PhD, MBA – Dept Family Medicine, Medical College of Georgia, Augusta GA

Martina Cartwright, RD, PhD – Independent contractor, Medical Liaison, Scottsdale AZ

Mark Jackson, DVM, PhD – School of Veterinary Medicine, University of Glasgow, Scotland

Evan Thackaberry, PhD – Scientist, Genentech, San Francisco CA

Katherine Debelak-Kragtorp, PhD – current position unknown

Victoria Drake, PhD – Scientist, Linus Pauling Institute, Corvallis OR

Echoleah Rufer, PhD – Scientist, Apple Inc., Cupertino CA

Adrienne Cheng, MPH – currently graduate researcher fellow in Smith lab

Postdoctoral Fellows

Robyn Amos-Kroohs, PhD –postdoctoral fellow in Smith lab

Shane Huebner, PhD –staff scientist in Smith lab

Susan Power, PhD –scientist in private industry, Philadelphia PA

Mary K. Walker, PhD –Professor of Pharmacology & Toxicology, Univ. New Mexico

Leah Dvorak, PhD –Professor of Biology, Concordia College, Milwaukee WI

Additional thesis committees in Zoology, Food Science, Dairy Science, Entomology, Nursing, Pharmacology

Medical School Interns: Clarissa Bauer, Mourad Abouelleil

Undergraduate research mentors since 2004: Marie Daleo, Megha Desai, Amy Felton, Megan Attridge, Bethany Steeber, Jordan Schmerling, Juna Abazi, Emily Wolfenden, Camille Pleisha

Undergraduate advisor to 30-35 students/yr enrolled in Dietetics and Nutritional Sciences

SERVICE**National Service**

2014	External steering committee, U54 Cooperative Agreement grant from NIAAA between Univ. North Carolina and North Carolina Central University.
2012	Expert panel on FASD Diagnostic Criteria, ICC-FASD
2010-2011	President, Fetal Alcohol Spectrum Disorders Study Group
2010	External Advisory Board for Superfund Research on Trichloroethylene (North Carolina State)
2009-2010	Vice-President, Fetal Alcohol Spectrum Disorders Study Group
2008-2009	Secretary / Treasurer, Fetal Alcohol Spectrum Disorders Study Group
2005-2006	Chair, NIH Study Section on Neurotoxicology & Alcohol (2005-2006)
2002-2004	External Advisory Board, P01 Heart Development and Role of Neural Crest (Duke University)

University-Level Committees

2011 - 2016	Chair, all-campus Occupational Health & Safety Committee
2009 - 2012	Principal Investigators Committee (reviews applications from non-tenure track faculty to receive permanent PI status)
2008 - 2016	Human Research Protection Program (HRPP) Advisory Committee
2005 - 2016	All-campus Occupational Health & Safety Committee, 2005 – present
2003 – 2005	Biological Sciences Executive Committee (evaluate and approve tenure decisions for Biological Sciences faculty)
2002 – 2005	General Education Committee (academic policy decisions across campus colleges)
2004	Ad hoc Committee on Mathematics Entrance Standards (GenEd Subcommittee)
2000-2002	Research Committee, The Graduate School (reviews & selects named professorships, review & rank campus-wide proposals for "insurance" funding)
1999-2002	IACUC member for Northern Lights Pharmaceuticals, PPL

College of Agricultural & Life Sciences Committees

2014 – 2015	Chair, external review committee for UW Dept. Animal Sciences self-study
2013 – 2016	Curriculum Committee
2005	Faculty Search Committee – Poultry Scientist position, Dept. Animal Sciences (M Berres hire)
2001 – 2004	Training Grant Committee, Program in Environmental Toxicology
1999 – 2001	Chair, Curriculum Committee
1998 – 2000	Graduate Admissions Committee, Program in Environmental Toxicology
1997 – 2003	Graduate Admissions Committee, Program in Endocrinology/Reproductive Physiology
1995 – 1999	Curriculum Committee (reviews & approves curricular policy and changes for College)

Departmental Committees (selected examples)

2014	Equity review committee for a senior faculty member
2014	Equity review committee for a senior faculty member
2013 – 2014	Chair, promotion committee for HC Lai from Associate to Full Professor
2013	Chair & PI on NIH proposal to upgrade departmental animal facility (not funded)
2011 -	Chair, Human and Clinical Emphasis Group of IGPNS
2011 -	IGPNS Executive Committee
2011 – 2012	Faculty Search Committee - Extension Specialist in Nutrition, Asst/Assoc Prof (B. Olson hire)
2007	Chair, Faculty Search Committee – Nutritional Biochemist / Metabolism (E Yen hire)
2006	Departmental Advisory Committee, trio of 3 elected faculty providing temporary departmental administration during a leadership vacuum
2004 -	Chair, Certification Committee for IGPNS (review & approve grad student progress)
2003 – 2012	Graduate Admissions Committee
2003 – 2008	Mentor Committee – HC Lai (successful promotion to Assoc Prof)
2001	CSREES documentation team, led writing of document evaluating our department's research program and suggested future directions, part of USDA-mandated review of our department as a Land-Grant Institution; led to increased College investment in our dept.

1998 – 2004 Chair, Curriculum Committee (review & approve curricular policy)
 Current additional service as member of Curriculum, Marketing / Website committees

OTHER

2002 – 2010 National Board of Directors, House Rabbit Society (Richmond CA)

LAY PUBLICATIONS

1. **Smith SM.** 2015. Invited speaker. “Fundamentals of Nutrition & Disease in Domestic Rabbits”, Wisconsin Exotic Animal Veterinary Conference, sponsored by UW Vet School. Madison WI. February 2015.
2. **Smith SM.** 2014. Invited speaker, “Practical Nutrition: Adapting Dietary Recommendations for Specific Rabbit Needs” 60 min oral presentation at the House Rabbit Society’s International Conference. St. Louis, MO.
3. **Smith SM.** 2012. “Pet Rabbits.” in: *Rabbit Production, 9th edition*. JI McNitt, NM Patton, SD Lukefahr, PR Cheeke, eds. Interstate Publishers: Danville, IL. Textbook chapter covering the care, nutrition, and medicine of companion domestic rabbits.
4. **Smith SM.** 2011. “Rabbit Nutrition.” 80 min DVD filmed by the National House Rabbit Society. Extended lecture on nutrition principles and their application to the domestic rabbit, including diet composition, how to read labels, and nutrition across the life-cycle and across disease states. Drollery Press: Alameda, CA
5. **Smith SM.** 2005. “Loving Thumper to Death.” Commissioned article in *Rabbits USA 2005-2006*. Lay article on companion rabbit obesity diagnosis and treatment.
6. **Smith SM.** 2004. “Are You Raising a Junk-Food Rabbit?” Commissioned article in *Rabbits USA 2004-2005*. Lay article on healthy food choices for pet rabbits.
7. **Smith SM.** 2002. “Beat the bad diet rap. Help your rabbit flourish using today’s nutritional know-how.” Commissioned article in *Rabbits USA, 2002-2003*. Article for the lay-person on companion rabbit health and nutrition. Rabbits USA is an annual publication sold in pet stores and book stores across North America.
8. **Smith SM.** 1999. “Pet Rabbits.” in: *Rabbit Production, 8th edition*. JI McNitt, NM Patton, SD Lukefahr, PR Cheeke, eds. Interstate: Danville, IL. Textbook chapter covering the care, nutrition, and medicine of companion domestic rabbits.