

# Jamie C. DeWitt

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## Contact Details:

Department of Pharmacology & Toxicology  
Brody School of Medicine, East Carolina University  
6S-10 Brody Building, 600 Moye Blvd., Greenville, NC 27834  
Phone: 252-744-2474  
Email: dewittj@ecu.edu  
Web Site: www.ToxicologyChick.com

Environmental toxicologist who employs principals from immunotoxicology, neurotoxicology, and developmental toxicology to understand how exposure to emerging environmental contaminants, such as per- and polyfluoroalkyl substances (PFASs), geogenic dusts, and pharmaceutical and personal care product pollutants, affect health and contribute to human diseases and disorders.

## EDUCATION & CERTIFICATIONS

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**Diplomate, American Board of Toxicology, 2017**

### **Ph.D., Environmental Science and Neural Science**

School of Public and Environmental Affairs and Program in Neural Science  
Indiana University, Bloomington, IN, 2004

Concentrations: Environmental and developmental neurotoxicology and risk assessment

Dissertation title: Developmental intoxication of dioxins and polychlorinated biphenyls in an avian model: Correlations of brain asymmetry, behavior, and related developmental effects

### **B.S., Environmental Science and Biology**

Lyman Briggs College, 1992  
Michigan State University, East Lansing, MI

## PROFESSIONAL EXPERIENCE

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### **Adjunct Associate Professor**

Toxicology Program, Biological Sciences, North Carolina State University, Raleigh, NC.  
March 2018-present.

### **Associate Professor of Pharmacology and Toxicology**

Department of Pharmacology and Toxicology, Brody School of Medicine, East Carolina University, Greenville, NC.  
July 2015-present.

### **Adjunct Associate Professor of Public Health**

Department of Public Health, Brody School of Medicine, East Carolina University, Greenville, NC.  
July 2015-July 2017.

### **Adjunct Assistant Professor of Public Health**

Department of Public Health, Brody School of Medicine, East Carolina University, Greenville, NC.  
July 2012-July 2014.

**Affiliated Member**

The Harriet and John Wooten Laboratory for Alzheimer's and Neurodegenerative Disease Research, East Carolina University, Greenville, NC.  
July 2011-present.

**Assistant Professor of Pharmacology and Toxicology**

Department of Pharmacology and Toxicology, Brody School of Medicine, East Carolina University, Greenville, NC.  
July 2008-July 2015.

**Postdoctoral Trainee in Immunotoxicology**

University of North Carolina at Chapel Hill in cooperation with the U.S. Environmental Protection Agency (Training Agreement CT829472), National Health and Environmental Effects Research Laboratory, Experimental Toxicology Division, Immunotoxicology Branch, Research Triangle Park, NC (Advisor: Dr. Robert Luebke). Evaluation of immune function and exploration of immunotoxic mechanisms, including use of knock-out models and molecular techniques, of various xenobiotics (organotins and perfluoroalkyl acids) in rodent models.  
June 2004-June 2008.

**Postdoctoral Research Associate in Environmental and Ecotoxicology**

Developmental Neurobiology and Environmental Toxicology Laboratory, School of Public and Environmental Affairs, Indiana University, in cooperation with the U.S. Fish and Wildlife Service Bloomington Ecological Services Field Office, Bloomington, IN (Advisors: Dr. Diane Henshel and Daniel Sparks). Cardiotoxic effects in wild passerine birds developmentally exposed to PCBs.  
September 2003-May 2004.

**Research Assistant in Environmental and Ecotoxicology**

Developmental Neurobiology and Environmental Toxicology Laboratory, School of Public and Environmental Affairs, Indiana University, Bloomington, IN (Advisor: Dr. Diane Henshel). Toxicological effects of dioxin and polychlorinated biphenyls after developmental exposure in an avian model, wild birds, and wild fish.  
August 1995-August 2003.

**Field Assistant in Limnology**

Lake Lemon Conservancy District, Unionville, IN. Canada goose control, littoral zone revegetation, and monitoring of native and exotic aquatic plant populations.  
June 2000-May 2003.

**Field Assistant in Ecotoxicology**

U.S. Fish and Wildlife Service-Bloomington Ecological Services Field Office, Bloomington, IN. Wild bird and macroinvertebrate population monitoring in a metal-contaminated lake, including assessment of fertile eggs for embryonic abnormalities.  
April 1997-October 1997.

**Research Associate in Entomology**

Landscape Entomology Division, Department of Entomology, Michigan State University, East Lansing, MI. Research and efficacy tests for forest, ornamental and turf entomological studies for the Michigan Department of Agriculture and Turf Foundation.  
September 1992-August 1995.

## Research Assistant in Entomology

Medical Entomology Division, Department of Entomology, Michigan State University, East Lansing, MI. Assessment of Lyme disease prevalence in deer and dog ticks collected from a Lyme disease endemic area in Michigan.  
May 1992-May 1993.

## PUBLICATIONS

### Peer-Reviewed Manuscripts

- vonderEmbse AN, Hu Q, DeWitt JC. 2019. Dysfunctional microglia:neuron interactions with significant female bias in a developmental gene x environment rodent model of Alzheimer's disease. *International Immunopharmacology*. 71:241-250.
- Keil DE, Buck B, Goossens D, McLaurin B, Murphy L, Leetham-Spencer M, Teng Y, Pollard J, Gerads R, and **DeWitt JC**. 2018. Nevada desert dust with heavy metals suppresses IgM antibody production. *Toxicology Reports*. 5:258-269.
- vonderEmbse AN, Hu Q, and **DeWitt JC**. 2017. Developmental toxicant exposure in a mouse model of Alzheimer's disease induces differential sex-associated microglial activation and increased susceptibility to amyloid accumulation. *Journal of Developmental Origins of Health and Disease*. 2:1-9.
- Meadows JR, Parker C, Gilbert KM, Blossom SJ, and **DeWitt JC**. 2017. A single dose of trichloroethylene given during development does not substantially alter markers of neuroinflammation in brains of adult mice. *Journal of Immunotoxicology*. 14:95-109.
- DeWitt JC**, Buck BJ, Goossens D, Teng Y, Pollard J, McLaurin B, Gerads R, and DE Keil. 2017. Health effects following subacute exposure to geogenic dust collected from active drainage surfaces (Nellis Dunes Recreation Area, Las Vegas, NV). *Toxicology Reports*. 4:19-31.
- Rushing BR, Hu Q, Franklin JN, McMahan R, Dagnino S, Higgins CP, Strynar MJ, and **DeWitt JC**. 2017. Evaluation of the immunomodulatory effects of 2,3,3,3-tetrafluoro-2-(heptafluoropropoxy)-propanoate in C57BL/6 mice. *Toxicological Sciences*. 156:179-189.
- Keil DE, Buck B, Goossens D, Teng Y, Pollard J, McLaurin B, Gerads R, **DeWitt JC**. 2016. Health effects from exposure to atmospheric mineral dust near Las Vegas, NV, USA. *Toxicology Reports*. 3:785-795.
- Jusko TA, Oktapoda M, Murinová LP, Babjaková J, Verner M-A, **DeWitt JC**, Babinská, Thevenet-Morrison K, Conka K, Drobná B, Thurston SW, Lawrence BP, Dozier AM, Jarvinene-Seppo KM, Patayová H, Trnovec T, Legler J, Hertz-Picciotto I, and Lamoree MH. 2016. Demographic, reproductive, and dietary determinants of perfluorooctane sulfonic (PFOS) and perfluorooctanoic acid (PFOA) concentrations in human colostrum. *Environmental Science and Technology*. 50:7152-7162.
- DeWitt JC**, Buck B, Goossens D, Hu Q, Chow R, David W, Young S, Teng Y, Leetham-Spencer M, Murphy L, Pollard J, McLaurin B, Gerads R, and Keil D. 2016. Health effects following subacute exposure to dusts from arsenic-rich sediment at the Nellis Dunes Recreation Area, Las Vegas, NV. *Toxicology and Applied Pharmacology*. 304:79-89.

- Leetham M, **DeWitt J**, Buck B, Goossens D, Teng Y, Pollard J, McLaurin B, Gerads R, and Keil D. 2016. Oxidative stress and lung pathology following geogenic dust exposure. *Journal of Applied Toxicology*. 36:1276-1283.
- Keil D, Buck B, Goossens D, Teng Y, Spencer M, Murphy L, Pollard J, Eggers M, Gerards R, and **DeWitt J**. 2016. Immunotoxicological and neurotoxicological profile of health effects following subacute exposure to geogenic dust from sand dunes at the Nellis Dunes Recreation Area, Las Vegas, NV. *Toxicology and Applied Pharmacology*, 291:1-12.
- DeWitt JC**, Williams W, Creech NJ, and RW Luebke. 2016. Suppression of antigen-specific antibody responses in mice exposed to perfluorooctanoic acid: Role of PPAR $\alpha$  and B cell targeting. *Journal of Immunotoxicology*. 13:38-45.
- Jiang Q, Ma W, Wu J, Wingard CJ, and **DeWitt JC**. 2016. Perfluorooctanoic acid-induced toxicity in primary cultures of chicken embryo cardiomyocytes. *Environmental Toxicology*. 31:1580-1590.
- Khalil N, Chen A, Lee M, Czerwinski SA, Ebert JR, **DeWitt JC**, and Kannan K. 2016. Association of perfluoroalkyl substances, bone mineral density, and osteoporosis in the US population in NHANES 2009-2010. *Environmental Health Perspectives*. 124:81-87.
- Wambaugh JF, Setzer W, Pitruzzello AM, Liu J, Reif D, Kleinstreuer N, Ching N, Wang Y, Sipes N, Martin M, Das K, **DeWitt J**, Strynar M, Judson R, Houck K, and Lau C. 2013. Dosimetric anchoring of in vivo and in vitro studies for perfluorooctanoate and perfluorooctanesulfonate. *Toxicological Sciences*. 136:308-327.
- Jiang Q, Lust R, and **DeWitt JC**. 2013. Perfluorooctanoic acid induced-developmental cardiotoxicity: Are peroxisome proliferator activated receptor  $\alpha$  (PPAR $\alpha$ ) and bone morphogenic protein 2 (BMP2) pathways involved? *Journal of Toxicology and Environmental Health Part A*. 76:635-650.
- Hu Q, Franklin JN, Bryan I, Morris E, Wood A, and **DeWitt JC**. 2012. Does developmental exposure to perfluorooctanoic acid (PFOA) induce immunopathologies commonly observed in neurodevelopmental disorders? *NeuroToxicology*. 33:1491-1498.
- Jiang Q, Lust R, Strynar MJ, and **DeWitt JC**. 2012. Perfluorooctanoic acid induces developmental cardiotoxicity in chicken embryos and hatchlings. *Toxicology*. 293:97-106.
- Fair PA, Stavros H-C, Mollenhauer MAM, **DeWitt JC**, Henry N, Kannan K, Mitchum G, Y SH, Bossart GD, Keil DE, and Peden-Adams MM. 2012. Immune function in female B6C3F1 mice is modulated by DE-71, a commercial polybrominated diphenyl ether mixture. *Journal of Immunotoxicology*. 9:96-107.
- Hu Q, Strynar MJ, and **DeWitt JC**. 2010. Are developmentally exposed C57BL/6 mice insensitive to suppression of TDAR by PFOA? *Journal of Immunotoxicology*. 7:344-349.
- DeWitt JC**, Copeland CB, and Luebke RW. 2009. Suppression of humoral immunity by perfluorooctanoic acid is independent of elevated serum corticosterone concentration in mice. *Toxicological Sciences*. 109:106-112.
- Peden-Adams MM, Stuckey JE, Gaworecki K, Berger-Ritchie J, Bryant K, Jodice PG, Scott TR, Boone S, McGuinn WD, **DeWitt JC**, and Keil DE. 2009. Developmental toxicity in white leghorn chickens

following in ovo exposure to perfluorooctane sulfonate (PFOS). *Reproductive Toxicology*. 27:307-318.

Whalen MM, **DeWitt JC**, Luebke RW. 2008. Serum supplementation modulates the effects of dibutyltin on human natural killer cell function. *Toxicological Sciences*. 104:312-319.

**DeWitt JC**, Copeland CB, Strynar MJ, and Luebke RW. 2008. Perfluorooctanoic acid-induced immunomodulation in adult C57BL/6J or C57BL/6N female mice. *Environmental Health Perspectives*. 116:644-650.

**DeWitt JC**, Copeland CB, and Luebke RW. 2008. An organotin mixture found in polyvinyl chloride (PVC) pipe is not immunotoxic to adult Sprague-Dawley rats. *Journal of Toxicology and Environmental Health Part A*. 71:276-282.

**DeWitt JC**, Copeland CB, and Luebke RW. 2007. Immune function is not impaired in Sprague-Dawley rats exposed to dimethyltin dichloride (DMTC) during development or adulthood. *Toxicology*. 232:303-310.

Lim J, **DeWitt JC**, Sanders RA, Watkins JB III, and Henshel DS. 2007. Suppression of endogenous antioxidant enzymes by 2,3,7,8-tetrachlorodibenzo-*p*-dioxin-Induced oxidative stress in chicken liver during development. *Archives of Environmental Contamination and Toxicology*. 52:590-595.

**DeWitt JC**, Copeland CB, and Luebke RW. 2006. Developmental exposure to 1.0 or 2.5 mg/kg of dibutyltin dichloride does not impair immune function in Sprague-Dawley rats. *Journal of Immunotoxicology*. 3:245-252.

**DeWitt JC**, Millsap DS, Yeager RL, Heise SS, Sparks DW, and Henshel, DS. 2006. External heart deformities in passerine birds exposed to environmental mixtures of polychlorinated biphenyls during development. *Environmental Toxicology and Chemistry*. 25:541-551.

**DeWitt JC**, Copeland CB, and Luebke RW. 2005. Immune responses in Sprague-Dawley rats exposed to dibutyltin dichloride in drinking water as adults. *Journal of Immunotoxicology*. 2:151-160.

**DeWitt JC**, Meyer EB, and Henshel DS. 2005. Environmental toxicity studies using chickens as surrogates for wildlife: Effects of vehicle volume. *Archives of Environmental Contamination and Toxicology*. 48:260-269.

**DeWitt JC**, Meyer EB, Watkins JB, and Henshel DS. 2005. Environmental toxicity studies using chickens as surrogates for wildlife: Effects of day of injection. *Archives of Environmental Contamination and Toxicology*. 48:270-277.

Stanton B, **DeWitt J**, Henshel D, Watkins S, and Lasley B. 2003. Fatty acid metabolism in neonatal chickens (*Gallus domesticus*) treated with 2,3,7,8-tetrachlorodibenzo-*p*-dioxin (TCDD) or 3,3',4,4',5-pentachlorobiphenyl (PCB-126) *in ovo*. *Comparative Biochemistry and Physiology C - Pharmacology and Toxicology*, 136(1):73-84.

Henshel DS, **DeWitt JC**, and Troutman, A. 2002. Using chicken embryos for teratology studies. In: *Current Protocols in Toxicology* (M.D. Maines, L.G. Costa, E. Hodgson, D.J. Reed, and I.G. Sipes, Eds.), Supplement 14, pp. 13.4.1-13.4.19.

Henshel DS, Martin JW and **DeWitt JC**. 1997. Brain asymmetry as a potential biomarker for developmental TCDD intoxication: A dose-response study. *Environmental Health Perspectives*. 105:718-725.

Henshel DS, Martin JW, Norstrom RJ, Elliot J, Cheng KM and **DeWitt JC**. 1997. Morphometric brain abnormalities in double-crested cormorant chicks exposed to polychlorinated dibenzo-*p*-dioxins, dibenzofurans, and biphenyls. *Journal of Great Lakes Research*. 23:11-26.

Walker ED, Smith TW, **DeWitt J**, Beaudou DC, McLean RG. 1994. Prevalence of *Borrelia burgdorferi* in host-seeking ticks (Acari: Ixodidae) from a Lyme disease endemic area in northern Michigan. *Journal of Medical Entomology*. 31(4):524-8.

### Review Articles

**DeWitt JC**, Blossom SJ, and Schaidler L. 2018. Exposure to per- and polyfluoroalkyl substances leads to immunotoxicity: Epidemiological and toxicological evidence. *Accepted to the Journal of Exposure Science and Environmental Epidemiology (invited)*.

Hopkins Z, Sun M, **DeWitt J**, and Knappe D. 2018. New drinking water contaminants: GenX and other per- and polyfluoroalkyl ether *Journal of the American Water Works Association*.

**DeWitt JC** and Patisaul HB. 2018. Endocrine disruptors and the developing immune system. *Current Opinion in Toxicology*. 10:31-36.

Wang Z, **DeWitt JC**, Higgins CP, and Cousins IT. 2017. A never-ending story of per- and polyfluoroalkyl substances (PFASs)? *Environmental Science & Technology*. 51:2508-2518.

Hessel EVS, Ezendam J, van Broekhuizen FA, Hakkert B, **DeWitt JC**, Granum B, Guzylack L, Lawrence BP, Penninks A, Rooney AA, Piersma AH, and van Loveren H. 2016. Assessment of recent developmental immunotoxicity studies with bisphenol A in the context of the 2015 EFSA t-TDI. *Reproductive Toxicology*. 65:448-456.

Corsini E, Luebke RW, Germolec DR, and **DeWitt JC**. 2014. Perfluorinated compounds: emerging POPs with potential immunotoxicity. *Toxicology Letters*, 230:263-270.

**DeWitt J**, Peden-Adams M, Keller J, and Germolec D. 2012. The immunotoxicity of perfluorinated compounds: Recent developments. *Toxicologic Pathology*, 40:300-311.

**DeWitt J**, Peden-Adams M, Keil D, and Dietert R. 2012. Current status of developmental immunotoxicity: Early-life patterns and testing. *Toxicologic Pathology*, 40:230-236.

Dietert RR, Dietert J, and **DeWitt JC**. 2011. Environmental risk factors for autism. *Emerging Health Threats Journal* (invited review). 4:7111.

Dietert RR, **DeWitt JC**, Germolec DR, and Zelikoff JT. 2010. Breaking patterns of environmentally influenced disease for health risk reduction: Immune perspectives. *Environmental Health Perspectives* 118:1091-1099.

**DeWitt JC**, Shnyra A, Badr MZ, Loveless SE, Hoban D, Frame SR, Cunard R, Anderson SE, Meade BJ, Peden-Adams MM, Luebke RW, and Luster MI. 2009. Immunotoxicity of perfluorooctanoic acid

and perfluorooctane sulfonate and the role of peroxisome proliferator activated receptor alpha. *Critical Reviews in Toxicology* 39:76-94.

### Edited Books

DeWitt JC, Rockwell CE, and Bowman CC (eds). 2018. *Immunotoxicity Testing: Methods and Protocols*, Methods in Molecular Biology Series. Springer Science + Business Media, LLC (Invited).

DeWitt JC (ed). 2015. *Toxicological Effects of Perfluoroalkyl and Polyfluoroalkyl Substances*. Springer Science + Business Media, LLC (Invited).

### Book Chapters

Meadows JR, **DeWitt JC**, and Rooney AA. 2018. Ecoimmunotoxicology – An overview. In: *Comprehensive Toxicology* (McQueen CA, ed) 3<sup>rd</sup> edition. Elsevier Ltd., Oxford.

**DeWitt JC** and Keil DE. 2017. Current issues in developmental immunotoxicity. In: *Immunopathology in Toxicology and Drug Development* (Parker GA, ed). Springer International Publishing, Switzerland.

**DeWitt JC**, Germolec DR, Luebke RW, and Johnson, VJ. 2016. Associating changes in the immune system with clinical diseases for interpretation of risk assessment. In: *Current Protocols in Toxicology*. 67:18.1.1-18.1.22.

**DeWitt JC**, Peden-Adams MM, and Keil DE. 2015. Immunotoxic effects of perfluoroalkylated compounds: Mechanisms of action. In: *Molecular Immunotoxicology* (Corsini E and van Loveren H, eds). Wiley-VCH GmbH & Co., Weinheim.

**DeWitt JC** and Dietert RR. 2014. Immunotoxicity in autism spectrum disorders. In: *The Comprehensive Guide to Autism* (Patel VB, Martin CR, Preedy V, and Preedy VR, eds). Springer Reference, New York, NY.

Dietert RR, **DeWitt JC**, and Luebke RW. 2012. Reducing the prevalence of immune-based chronic disease. In: *Immunotoxicity, Immune Dysfunction, and Chronic Diseases* (Dietert RR and Luebke RW, eds), Molecular and Integrative Toxicology, Springer Science + Business Media, LLC. pp 419-440.

**DeWitt J**, Peden-Adams M, Keil D, and Dietert R. 2012. Developmental immunotoxicity (DIT): Assays for evaluating effects of exogenous agents on development of the immune system. In: *Current Protocols in Toxicology*. Chapter 18: Unit 18.15.

Luebke RW, **DeWitt JC**, Germolec DR, Salazar KD, and Kerkvliet NI. 2012. Immunomodulation by persistent organic pollutants. In: *Dioxins and Health, Including Other Persistent Organic Pollutants and Endocrine Disruptors, 3<sup>rd</sup> Edition* (Schechter A, ed), John Wiley and Sons, Inc., Hoboken, NJ. pp 171-192.

**DeWitt JC** and Dietert RR. 2012. Postnatal immune dysfunction and its impact on growth parameters. In: *Handbook of Growth and Growth Monitoring in Health and Disease* (Preedy VR, ed), Springer, New York, NY. pp 741-755.

**DeWitt JC** and Luebke RW. 2010. Immunological Aging. In: *Comprehensive Toxicology*, 2<sup>nd</sup> Edition, Volume 5 (Lawrence D, ed), Elsevier Limited, Oxford, UK. pp 455-465.

Dietert RR and **DeWitt J**. 2010. Developmental immunotoxicity (DIT): The why, where and how of DIT testing. In: *Immunotoxicity Testing: Methods and Protocols* (Dietert RR, ed), Methods in Molecular Biology. Humana Press, Inc., Totowa, NJ. 598:17-25.

Luebke RW, Beamer CA, Bowman C, **DeWitt JC**, Gowdy K, Johnson VJ, Shepherd DM, and Germolec DR. 2009. Immunotoxicology (developmental immunotoxicology section). In: *General and Applied Toxicology*, 3<sup>rd</sup> Edition (Marrs T, Ballantyne B, Syversen T, eds.), John Wiley & Sons, Ltd., Chichester, UK, pp 1561-1583.

### **Other Scholarly Contributions**

Portier CJ et al. (90+ co-authors). 2016. Differences in the carcinogenic evaluation of glyphosate between the International Agency for Research on Cancer (IARC) and the European Food Safety Authority (EFSA). *Journal of Epidemiology and Community Health*. 70:741-745.

**DeWitt JC** and Luebke RW. 2014. Immunological Aging. *Online Reference Database Biomedical Science*.

Benbrahim-Tallaa L, Lauby-Secretan B, Loomis D, Guyton KZ, Grosse Y, El Ghissassi F, Bouvard V, Guha N, Mattock H, and Straif K *on behalf of the International Agency for Research on Cancer Monograph Working Group (DeWitt JC, Mechanisms Subgroup Member)*. 2014. Carcinogenicity of perfluorooctanoic acid, tetrafluoroethylene, dichloromethane, 1,2-dichloropropane, and 1,3-propane sultone. *The Lancet Oncology*. 15:924-925.

IARC. 2014 Perfluoro-octanoic acid, Tetrafluoroethylene, Dichloromethane, 1,2-Dichloropropane, and 1,3-Propane sultone. *IARC Monogr Eval Carcinog Risks Hum (DeWitt JC, Mechanisms Subgroup Member)*. *Monograph 110*.

**DeWitt JC** and Dietert RR. 2011. Response to "Theoretical aspects of autism: Causes - a review" by Ratajczak, HV (*Journal of Immunotoxicology* 8:68-79, 2011). *Journal of Immunotoxicology*. 8:195-197.

### **Non-Refereed Articles**

"Toxicant induced brain asymmetry: More than just a bird-brained scheme?" Learned Discourses, *SETAC Globe*, Jan/Feb 2001 (invited).

### **RESEARCH FUNDING**

Department of Defense 3 years  
***New Approaches for the Treatment of Neuroinflammatory and Behavioral Consequences of Exposure to Gulf War Illness Chemicals***  
*Role on project: Principal Investigator*  
*Status: Award notification March 2019. Direct costs: \$699,564.*

United States Environmental Protection Agency via subcontract from Oregon State University 3 years  
***System Toxicological Approaches to Define and Predict Toxicity of Per- and Polyfluoroalkyl Substances***  
*Role on project: Co-Principal Investigator (R. Tanguay, PI, OSU)*  
*Status: Award notification September 2018. Direct costs to ECU: \$391,981.*



North Carolina Policy Collaboratory 1.5 years  
***Per- and Polyfluoroalkyl Substance Testing (PFAST) Network: Effects of novel PFASs on immune function***  
*Role on project: Co-Principal Investigator and Team Co-Lead (with R. Fry, UNC-CH)*  
*Status: Award notification September 2018. Direct costs to ECU: \$168,068.*

North Carolina Policy Collaboratory 6 months  
***Emerging contaminants in North Carolina, including PFASs, 1,4-dioxane, and bromide, in air and water***  
*Role on project: Co- Principal Investigator*  
*Status: Award notification July 2018. Direct costs to ECU: \$12,000.*

National Institutes of Health/National Institute of Environmental Health Sciences via subcontract with North Carolina State University 2 years  
***Assessing Impact of Drinking Water Exposure to GenX in the Cape Fear River Basin***  
*Role on project: Co-Investigator (J. Hoppin, NCSU, PI)*  
*Status: Award notification November 2017. Direct costs to ECU: \$20,000*

Brody Brothers Endowment Foundation 1 year  
***Immunomodulatory Effects of Aqueous Film Forming Foam (AFFF): An Effective Fire Suppressant or a Persistent Environmental Contaminant with Unknown Health Consequences?***  
*Role on project: Principal Investigator*  
*Status: Award notification November 2016. Direct costs: \$20,000*

Center for Human Health and Environment at NCSU Pilot Project Program 1 year  
***Discovery of Biomarkers of Effect following Environmentally-Relevant Exposure to Pharmaceutical Pollutants***  
*Role on project: Co-Principal Investigator (E. Hvastkovs and K. McCoy, ECU, co-PIs)*  
*Status: Award notification August 2015. Direct costs: \$25,000*

Brody School of Medicine Internal Seed/Bridge Grant Program 1 year  
***Post-translational Modifications to Potassium Channels in Alzheimer's Disease: Triggers of Onset and Progression?***  
*Role on project: Co-Principal Investigator (R. Schwalbe, ECU, co-PI)*  
*Status: Award notification August 2015. Direct costs: \$25,000*

The Harriet and John Wooten Laboratory for Alzheimer's and Neurodegenerative Disease Research 1 year  
***Microglia as a Target of Environment x Gene Interactions Part II: Digging into the Biochemistry of Alzheimer's Disease***  
*Role on project: Principal Investigator (R. Schwalbe, ECU, co-PI)*  
*Status: Award notification November 2014. Direct costs: \$12,000*

Interdisciplinary Research Collaboration Award (East Carolina University) 6 months  
***Pharmaceutical and Personal Care Product Contaminants in Fresh Water***  
*Role on Project: Corresponding Faculty PI*  
*Status: Award notification August 2014. Direct costs: \$23,000*

Alzheimer's North Carolina 1 year  
***A Multidisciplinary Approach to Fight Senior Dementia***

Role on Project: Co-Investigator (Q. Lu, ECU, PI)

Status: Award notification February 2014. Direct costs: \$50,000

East-West Research Collaboration Award (East Carolina University)

6 months

**Pharmaceutical and Personal Care Product Contaminants in Fresh Water**

Role on Project: Corresponding Faculty PI

Status: Award notification December 2013. Direct costs: \$23,000

The Harriet and John Wooten Laboratory for Alzheimer's and  
Neurodegenerative Disease Research

1 year

**Microglia as a Target of Environment x Gene Interactions: Exacerbation of Alzheimer's Pathology  
by Early-life Exposure to Lead**

Role on project: Principal Investigator

Status: Award notification April 2013. Direct costs: \$12,000

Bureau of Land Management via subcontract from University of Nevada-LV

3 years

**Nellis Dunes Recreation Area Dust Exposure and Human Health Risk Assessment**

Role on project: Co-Principal Investigator (B. Buck, UNLV, PI)

Status: Award notification March 2011. Direct costs to ECU: \$105,699

Department of Defense

1 year

**Immunopathogenesis in autism: Regulatory T cells and autoimmunity in neurodevelopment**

Role on project: Principal Investigator

Status: Award notification December 2009. Direct costs: \$75,000

School of Public and Environmental Affairs, Indiana University. Ph.D. Student Travel Award and  
Graduate Student Organization Travel Award. 2001. Funded amount: \$500.00

Ohio Valley Chapter of the Society of Environmental Toxicology and Chemistry. Student Travel Grant.  
1997, 1998, 2001. Funded amounts: \$300.00 each year

## **EDITORIAL BOARDS/AD HOC MANUSCRIPT REVIEWER**

Editorial Board Member, *Journal of Immunotoxicology*. 2010-

Editorial Board Member, *Journal of Toxicology and Environmental Health Part A*. 2013-

Associate Editor, *Toxicology and Applied Pharmacology*. 2016-

Series co-Editor (with Sarah Blossom), *Molecular and Integrative Toxicology*. 2016-

Editorial Board Member, *Environmental Health Perspectives*. 2017-

Editorial Board Member, *NeuroToxicology*. 2018-

Editorial Board Member, *PLoS One*. 2018-

Editorial Board Member, *Reproductive Toxicology*, 2019-

### *Ad Hoc Reviewer:*

Advances in Physiology Education

Archives of Toxicology

Chemosphere

Environmental Health Perspectives

Environmental Research

Environmental Science & Technology

Food and Chemical Toxicology

Human & Experimental Toxicology

Archives of Environmental Contamination & Toxicology

Chemical Research in Toxicology

Drug and Chemical Toxicology

Environment International

Environmental Science & Pollution Research

Epidemiology

GENE

International Aquatic Research

International Immunopharmacology  
International Journal of Tropical Biology  
Journal of Toxicology & Environmental Health  
Pharmacological Research  
Regulatory Toxicology & Pharmacology  
Science of the Total Environment  
Toxicology & Applied Pharmacology  
Toxicology Reports

Journal of Environmental Immunology & Toxicology  
Journal of Immunotoxicology  
NeuroToxicology  
PLoS One  
Reproductive Toxicology  
Southeastern Naturalist  
Toxicology Letters  
Toxicological Sciences

### **GRANT REVIEWER & REVIEW PANEL CHAIR**

Department of Defense Congressionally Directed Medical Research Programs, Review Panel Chair, 2018  
CORIS, Consorzio per la Ricerca Sanitaria, 2018  
Department of Defense Congressionally Directed Medical Research Programs, 2013-2018  
Graduate Women in Science Graduate Fellowships, 2011, 2014-2018  
CDC-NIOSH, 2010, 2013, 2016

### **EXTERNAL REVIEWER**

ATSDR, 2017 (manuscript and Toxicological Profile)  
New York State Department of Public Health, 2017 (Cancer incidence investigation: Village of Hoosick Falls, Rensselaer County, New York)

### **ORAL PRESENTATIONS (Invited)**

“PFAS and Health: What we’ve learned in the Past Two Years.” *Center for Human Health and the Environment Third Annual Symposium*. North Carolina State University, Raleigh, NC. 2019.

“Three Reasons that Per- and Polyfluoroalkyl Substances do not belong in our Bodies.” *University of North Carolina Wilmington Department of Chemistry and Biochemistry Seminar*, Wilmington, NC. 2019.

“Immunotoxicological Findings of an Aqueous Film-Forming Foam Formulation.” *Society of Environmental Toxicology and Chemistry annual meeting*, Sacramento, CA. 2018.

“PFAS Exposure: What are the Health Implications?” *Cape Fear Public Utility Authority Board Workshop*, Wilmington, NC. 2018.

“Impact of Early-Life Environmental Factors on the Developing Immune system.” *PPTOX VI*, Faroe Islands. 2018.

“Health Effects of GenX: What do we know and what do we need to know to Protect Public Health?” *45<sup>th</sup> Annual Meeting of the Cape Fear River Assembly*, Wilmington, NC. 2018.

“How do we know Whether a Chemical is Toxic?” *Osher Lifelong Learning Institute Sea & Coffee Series*, University of North Carolina at Wilmington, Wilmington, NC. 2018.

“PFASs, AFFFs, PFAAs: An Alphabet Soup of Emerging Aquatic Contaminants with Immunotoxic Potential.” *NCSU Toxicology Program Seminar Series*, North Carolina State University, Raleigh, NC. 2018.

“How Per- and Polyfluoroalkyl Substances (PFASs), as EDCs, can Fool the Developing Brain’s Immune System.” *EDC-NC Annual Meeting*. RTP, NC. 2018.

“Research Challenges Associated with PFASs: Ubiquitous Multisystem Toxicants.” *The Toxicology Forum Winter Meeting*. Washington DC. 2018.

“Environmental Triggers of Underlying Neuroimmune Susceptibilities: Critical Events in Development.” *Webinar*, Autism Research Institute. 2018.

“Are Replacements for the Legacy PFASs Indisputably Safe Alternatives?” *Webinar*, Toxic-Free Future. 2018.

“Per and Polyfluoroalkyl Substances: Complex Chemicals that Challenge Policies for Environmental Health Protection and Risk Communication.” *Brown Bag Lunch*, RTI International, RTP, NC. 2018.

“From Legacies to Alternatives: What we know and what we need to know about the Toxicity of Per- and Polyfluoroalkyl Substances.” *Weekly Seminar*, NC Department of Health and Human Services, Raleigh, NC. 2017.

“The Never-Ending Story of Per- and Polyfluoroalkyl Substances: Immunotoxicity from Legacies to Alternatives.” *Mid Atlantic Society of Toxicology Annual Meeting*, Edison, NJ. 2017.

“A Potential Never-Ending Story of Chemical Water Pollution in LMICs: Proliferation of Legacy and Replacement PFASs.” *International Society of Exposure Science*, Research Triangle Park, NC. 2017.

“The Science behind GenX.” *Water Wednesday*, Clean Cape Fear, Wilmington, NC. 2017.

“Is it Possible to Untangle Underlying Developmental Susceptibilities from Exogenous Triggers in ASD?” *Autism Think Tank*, Autism Research Institute, Dallas-Fort Worth, TX. 2017.

“Urgent Research Needs for Better Understanding the Toxicity of PFASs.” *Northeast Superfund Research Program Meeting*, Northeastern University, Boston, MA. 2017.

“Emerging Toxicological Knowledge and Data Gaps for “Novel” PFASs.” *Public Workshop on Perfluoroalkyl and Polyfluoroalkyl Substances (PFASs) in Carpets, Rugs, Indoor Upholstered Furniture, and Their Care and Treatment Products*, Safer Consumer Products Program, Department of Toxic Substances Control, California Environmental Protection Agency, Sacramento, CA. 2017.

“Pharmaceuticals and Personal Care Products as Emerging Pollutants in Coastal Waters (with Dr. Siddhartha Mitra).” *Science on the Sound Symposium*, Coastal Studies Institute, Wanchese, NC. 2017.

“Emerging Aquatic Contaminants and Health: Finding Solutions with Transdisciplinary Teams.” Coastal Health Initiative, East Carolina University, Greenville, NC. 2016.

“Water Pollution: Is seeing believing?” *Love a Sea Turtle Second Annual Environmental Symposium*, River Park North, Greenville, NC. 2016.

“Developmental Immunotoxicology.” *Middle Atlantic Reproduction and Teratology Association*, Covance Research Products, Inc., Denver, PA. 2015.

"A Little Bit of this and a Little Bit of that...How do we Understand Risks of Agents in just a Drop of Water?" *Love a Sea Turtle First Annual Environmental Symposium*, River Park North, Greenville, NC. 2015.

"Updates on Alzheimer's Disease Research in the DeWitt Lab at East Carolina University" (with Annalise vanderEmbse). *Senior Services Community Health Program*, Vidant Medical Center, Greenville, NC. 2015.

"Immunomodulatory Effects of Perfluoroalkyl Substances in Rodents and Humans." *Immunotoxicology in Food and Ingredient Safety Assessment: Approaches and Case Studies, SOT FDA Colloquia on Emerging Toxicological Science Challenges in Food and Ingredient Safety*, Washington, DC. 2015.

"Updates on Alzheimer's Disease Research in the DeWitt Lab at East Carolina University" (with Annalise vanderEmbse). *Alzheimer's Professional Partnership-Greenville*, Greenville, NC. 2015.

"From Sink to Sea: Evaluating Health Impacts of Pills and Perfumes after we Wash them away" (with Krista McCoy). *FaculTea Seminar*, East Carolina University, Greenville NC. 2014.

"Better Living through Chemistry: A Tale of Two Toxicants." *Department of Chemistry Seminar*, East Carolina University, Greenville, NC. 2014.

"The Nuts and Bolts of Interdisciplinary Toxicological Research" (with Christie Sayes). *Western Carolina University Department of Biology Spring Seminar Series*. Cullowhee, NC. 2014.

"Alzheimer's Disease and Neurodegenerative Disorders Research at East Carolina University" (with Annalise vanderEmbse). *Alzheimer's Professional Partnership-Goldsboro*, Goldsboro, NC. 2015.

"Endocrine Disruption of the Neuro-immune Interface." *The Collaborative on Health and the Environment Partnership Call* (Teleseminar). 2014

"Contaminated Drinking Water: A Case Study of Perfluorinated Compounds." *Coastal Water Resources Center*, East Carolina University, Greenville, NC. 2013.

"Villains and Heroes in the Battle for Clean Water" (with Siddhartha Mitra and Anthony Cannon). *STEM at Starlight*, Greenville, NC. 2013.

"The Nuts and Bolts of Alzheimer's Disease Research at East Carolina University." *Senior Services Community Health Program*, Vidant Medical Center, Greenville, NC. 2013.

"Alzheimer's Disease and Neurodegenerative Disorders Research at East Carolina University." *Alzheimer's Professional Partnership-Greenville*, Greenville, NC. 2013.

"A Neuroimmune Investigation of an Endocrine-Disrupting Compound". *Department of Biology Seminar*, East Carolina University, Greenville, NC. 2013.

"A Neuroimmune Investigation of an Endocrine-Disrupting Compound: How Bisphenol A may Disrupt Learning and Memory through Immunomodulation." *Endocrine Disrupting Chemicals Forum*, Research Triangle Park, NC. 2013.

"Undecafluoro-2-methyl-3-oxahexanoic Acid Versus Perfluorooctanoic Acid: Is Polyfluorination a Less Immunotoxic Option than Perfluorination?" *Department of Environmental and Molecular Toxicology Seminar*, North Carolina State University, Raleigh, NC. 2013.

"Early Life Triggers of Developmental Immunotoxicity." *Society for Toxicologic Pathology*, Annual Meeting, Denver, CO. 2011.

"Is the Pathway to Autism Paved with Environmental Chemicals?" *Department of Comparative Medicine seminar*. East Carolina University, Greenville, NC. 2011.

"PPAR Involvement in PFAA Immunotoxicity." *U.S. EPA PFAA Days III Workshop*, U.S. Environmental Protection Agency, Research Triangle Park, NC. 2010.

"Are Environmental Contaminants (Developmental) Immunotoxicants? A Case Study of a Fluorinated Compound." *Department of Microbiology and Immunology Seminar*, East Carolina University, Greenville, NC. 2010.

"Developmental Immunotoxicity of PFOA, an Emerging Contaminant." *Department of Biology Seminar*, East Carolina University, Greenville, NC. 2009.

"The Immunotoxicity of Perfluorooctanoic Acid (PFOA)." *Department of Physiology Seminar*, Brody School of Medicine, East Carolina University, Greenville, NC. 2008.

"Immunotoxic Potentials of PFOA." *U.S. EPA PFAA Days II Workshop*, U.S. Environmental Protection Agency, Research Triangle Park, NC. 2008.

"Chasing Down the Mechanism of Perfluorooctanoic Acid-Induced Immunomodulation: Knock-outs and Adrenalectomies." *National Health and Environmental Effects Research Laboratory Work in Progress*, U.S. Environmental Protection Agency, Research Triangle Park, NC. 2007.

"Wildlife Immunotoxicology." Immunotoxicology course. College of Veterinary Medicine, North Carolina State University. 2006.

"Immunotoxicity of Individual Organotin Compounds in Sprague-Dawley Rats." *Society for Risk Analysis 25<sup>th</sup> Annual Meeting*, Orlando, FL. 2005.

"Immune Function in Rats Exposed to Organotins as Adults or During Development." *National Health and Environmental Effects Research Laboratory Work in Progress*, U.S. Environmental Protection Agency, Research Triangle Park, NC. 2005.

"Brain Asymmetry in Domestic Hatchling Chickens Developmentally Exposed to TCDD: A Histological Examination." *Society of Environmental Toxicology and Chemistry 24<sup>th</sup> Annual Meeting*, Austin, TX. 2003.

"Service Learning and Scientific Research." Indiana University Community Outreach and Partnerships in Service-Learning Workshop, Indiana University, Bloomington, IN. 2004.

"Toxic Effects of Mercury." Clean Air Indiana Speak out on the Clear Skies Initiative, Indiana University, Bloomington, IN. 2003.

“Environmental Health Concerns for Toxics in Indiana Superfund Sites.” Indiana Public Interest Research Group (INPIRG) Teach-In on Indiana Superfund Issues, Indiana University, Bloomington, IN. 2002.

“Introduction to Environmental Toxicology.” Techniques in Environmental Science and Environmental and People courses. School of Public and Environmental Affairs, Indiana University-Bloomington. 2000, 2001, 2003.

“Bioaccumulation and Biomagnification of Environmental Chemicals in Colonial Fish-eating Waterbirds.” Introduction to Environmental Sciences course. School of Public and Environmental Affairs, Indiana University-Bloomington. 2000 and 2001.

“Women in the Sciences: Abolishing Gender Apartheid.” IU Skills for Leadership Conference, Office of Women’s Affairs, Indiana University, Bloomington, IN. 1999.

### **ORAL PRESENTATIONS**

“Perspectives from the AAMC Mid-Career Women Faculty Professional Development Seminar “MIDWIMS”). *Brody Women Faculty Committee*. Greenville, NC. 2017.

“Immunopathogenesis in Autism: Regulatory T Cells and Markers of Autoimmunity in Mice Developmentally Exposed to Perfluorooctanoic Acid (PFOA).” *27<sup>th</sup> Annual NeuroToxicology Conference*, Annual Meeting, Durham, NC. 2011.

“PFOA-induced Immunomodulation in mice: An Overview.” *Society of Toxicology 48<sup>th</sup> Annual Meeting*, Baltimore, MD. 2009.

“Pathways of PFOA-mediated Immunosuppression.” *Society of Toxicology 48<sup>th</sup> Annual Meeting*, Baltimore, MD. 2009.

“Dose-response of Perfluorooctanoic Acid-Induced Immunomodulation in Adult C57BL/6 Mice.” *Society of Toxicology 46<sup>th</sup> Annual Meeting*, Charlotte, NC. 2007.

“Immune Function in Rats Developmentally Exposed to Dibutyltin Dichloride.” *Society of Toxicology 45<sup>th</sup> Annual Meeting*, San Diego, CA. 2006.

“Neurotoxic Effects in Avian Species: Implications for Human and Ecological Health.” School of Public and Environmental Affairs *2<sup>nd</sup> Annual Young Researchers Conference*, Indiana University, Bloomington, IN. 2002.

“TCDD-Induced Brain Asymmetry and Behavior: What do Individual Chicks Have to Say?” *Ohio Valley Chapter of the Society of Environmental Toxicology and Chemistry*, Hueston Woods State Park, College Corner, OH. 2000.

“Behavioral and Morphological Changes in Domestic Chicks Exposed to TCDD or PCB-126 at Embryonic Day 0 or Embryonic Day 4.” *Ohio Valley Chapter of the Society of Environmental Toxicology and Chemistry*, Indiana University, Bloomington, IN. 1997.

“Behavioral Changes in Domestic Hatchling Chicks Exposed to 2,3,7,8-tetrachlorodibenzo-*p*-dioxin (TCDD) *in ovo*.” *Conference on Chlorine in the Environment*, Massachusetts Institute of Technology, Boston, MA. 1996.

“Behavioral Assessment of Hatchling Chicks Exposed to TCDD *in ovo*: Preliminary Results.” *Great Lakes Bioeffects Workgroup*. Wright State University, Dayton, OH and *Ohio Valley Chapter of the Society of Environmental Toxicology and Chemistry*, Eastern Kentucky University, Richmond, KY. 1996.

### **CONTINUING EDUCATION COURSES**

Stress as a Confounding Factor in Toxicology Studies  
Rodent Pathology (Immunopathology)  
Basic Embryology and Developmental Toxicology  
Grants 101: Professional Grant Writing Workshop  
Immunology for Toxicologists  
Risk Communication for the General Public  
Estrogen Mimics in Health and Disease  
Methods for Assessment of Neurotoxicity

### **PROFESSIONAL ORGANIZATIONS**

<b>2017-Present</b>	International Society of Exposure Science
<b>2009-Present</b>	Carolinas Society of Environmental Toxicology and Chemistry
<b>2005-Present</b>	Society of Toxicology (SOT)
<b>2005-Present</b>	North Carolina Chapter of the Society of Toxicology
<b>1997-Present</b>	Society of Environmental Toxicology and Chemistry (SETAC)
<b>1996-2004</b>	Ohio Valley Chapter of the Society of Environmental Toxicology and Chemistry
<b>1996-2004</b>	Great Lakes Bioeffects Workgroup

### **AWARDS AND HONORS**

- *The Faculty Mentor Award*, East Carolina University Honors College. 2017.
- *Outstanding Young Investigator Award*, Immunotoxicology Specialty Section, Society of Toxicology. 2013.
- *Outstanding Teaching Award*, School of Public and Environmental Affairs, Indiana University. 1999 and 2002.
- *Future Faculty Teaching Fellowship*, Preparing Future Faculty program, Indiana University. 2002.
- *Marian Vinegar Award*, Outstanding Student Presentation at the annual meeting, Ohio Valley Chapter of the Society of Environmental Toxicology and Chemistry. 2000.
- *Outstanding Educational Volunteer*, Monroe County Humane Association, Bloomington, IN. 2000.
- *Outstanding Student Poster Award*, Society of Environmental Toxicology and Chemistry 19<sup>th</sup> Annual Meeting (3<sup>rd</sup> place). 1998.
- *Teaching Excellence Recognition Award*, School of Public and Environmental Affairs, Indiana University. 1998.

### **PROFESSIONAL PRACTICE**

**Workshop Participant**, Sustainability consequences of chemical exposures: connecting environment, health, and economic assessments. Organized by the European Environmental Agency, Copenhagen, Denmark. June, 2018.

- Panelist representing the toxicological sciences.

**Pro-bono Consultation**, various environmental protection and advocacy organizations, 2015-present.

- Provided scientific interpretation and opinion regarding toxicity of per- and polyfluoroalkyl substances to individual community members as well as organizations.



- Organizations included: *California Environmental Protection Agency, Cape Fear Public Utility Authority, Center for Environmental Health, Green Science Policy Institute, Massachusetts Toxic Use Reduction Program, Silent Spring Institute, and Toxic Free Future.*

**Plaintiff Expert Witness**, Natural Resource Damage Assessment (NRDA) claim by the state of Minnesota against a major corporate entity. November 2016-February 2018.

- Provided toxicological expertise regarding per- and polyfluoroalkyl substances.
- Claim for \$5 billion; settled for \$850 million. Third largest NRDA claim in U.S. history.

**Workshop Participant**, Is the European Food Safety Authority (EFSA) standard for bisphenol A sufficiently protective of the immune system and should the Dutch government consider a different standard? Organized by representatives of RIVM (National Institute for Public Health and the Environment), Amsterdam, The Netherlands. September, 2015.

- Provided immunotoxicological guidance for regulatory consideration of bisphenol A (BPA).

**Consultant**, CZR Incorporated, Wilmington, NC. May-July, 2014-present.

- Provided toxicological interpretation of stream water quality monitoring data for heavy metals.

**Technical Advisor**, Office of Health Assessment and Translation (OHAT), National Toxicology Program, National Institute of Environmental Health Sciences. March 2013. March 2015. April 2016.

- Evaluated OHAT protocol for evaluation of PFOS-PFOA immunotoxicity.

**External Peer Reviewer**, U.S. Environmental Protection Agency, External peer review of EPA's Draft Health Effects Documents for Perfluorooctanoic acid (PFOA) and Perfluorooctane Sulfonate (PFOS). 2014.

- Scientific peer reviewer of the health effects documents. Nominated and selected.

**Working Group Member**, International Agency for Research on Cancer (IARC), IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Volume 110: Perfluorooctanoic acid, Tetrafluoroethylene, Dichloromethane, 1,2-Dichloropropane, and 1,3-Propane sultone. 2014.

- Member of Mechanistic and Other Relevant Data Working Group for perfluorooctanoic acid and tetrafluoroethylene. Invited.

**Consultant**, Constella Group, LLC, Durham, NC. October 2004-December 2005.

- Summarized immunotoxicology of atrazine for the National Toxicology Program's Report on Carcinogens.

**Consultant**, Henshel EnviroComm, Bloomington, IN. June 1999-May 2004.

- Representative of the Restoration Advisory Board for Jefferson Proving Ground (Department of Defense) through the Technical Assistance for Public Participation program.
- Interpreted risk assessment documents associated with base clean-up for the general public.

**Consultant**, Dinosaur Inc., Bloomington, IN. June 2000-September 2000.

- Summarized the potential health and environmental effects of land-applied paper mill sludge.

**Consultant**, Integrated Pest Management in Schools and Childcare Centers, School of Public and Environmental Affairs Information Clearinghouse, Bloomington, IN. April 2000-September 2000.

- Summarized the potential health effects of pesticides commonly used in schools and childcare centers.

**Co-Director**, *Summer Program for Exploration of Complex Issues in Environmental Science for Teachers (SPECIES-Teachers)* and *Environmental Education 99*, School of Public and Environmental Affairs, Indiana University, Bloomington, IN. Summer 1999 and 2001.

- Directed hands-on environmental science summer field workshop for Indiana teachers.

**Consultant**, Brownstown Elementary Fourth Grade, Brownstown, IN. September 1999-May 2000.

- Served as environmental science expert during weekly videoconferences in a “students as environmental scientists” program.

**Associate Director**, *Research Experience for High School Students*, College of Arts and Sciences, Indiana University, Bloomington, IN. February 1999-October 1999.

- Mentored high school students participating in research in university laboratories, provided weekly counseling, and oversaw development of final research reports and presentations.

**Co-Director**, *Environment 98* and *Environment 99*, School of Public and Environmental Affairs, Indiana University, Bloomington, IN. Summer 1998 and 1999.

- Directed hands-on environmental science summer field workshop for Indiana students.

**Chemical Safety Assistant**, Office of Radiation, Chemical and Biological Safety, Michigan State University, East Lansing, MI. August 1993-June 1995.

- Developed Michigan State University’s Chemical Hygiene Plan, performed university-wide laboratory safety inspections, and trained new science employees in chemical and laboratory safety.

## TEACHING EXPERIENCE

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### ***Instructor, East Carolina University***

- Practical Problems in Biometry. Graduate (course director).
- General Toxicology. Graduate (co-course director).
- Advanced Toxicology. Graduate (co-course director)
- Medical Pharmacology. Graduate physician assistant students (topical: endocrine pharmacology, toxicology).
- Medical Pharmacology. Second year medical students (topical: endocrine pharmacology, toxicology).
- Pharmacology Mini-Course. First and second year dental students (topical: toxicology, management of poisoned patients, endocrine pharmacology).
- Foundations of Medicine/Problem Based Learning Mini-Course. First and second year medical students.
- Foundations of Medicine/PirateMD. First and second year medical students.

### ***Instructor, Indiana University***

- Analytical Problem Solving (statistics). Undergraduate, honors, 2 semesters.
- Environment and People. Undergraduate (co-instructor), 1 semester.
- Introduction to Statistical Techniques. Undergraduate, 1 semester.
- Introduction to Environmental Sciences. Undergraduate, 1 semester.
- Environmental Risk Analysis. Graduate, 1 semester.
- Outdoor Environmental Awareness (Public land management). Undergraduate recruitment course, 6 semesters.
- Introduction to Risk Assessment and Risk Communication. Undergraduate, 1 semester.

- Environmental Toxicology. Combined undergraduate/graduate, 1 semester.
- Techniques in Environmental Science (field/lab techniques). Undergraduate, 3 semesters.

### ***Teaching Assistant/Coordinator, Indiana University***

- Aquatic Habitat Analysis (field techniques). Combined undergraduate/graduate, 3 semesters.
- Terrestrial Habitat Analysis (field techniques). Combined undergraduate/graduate, 3 semesters.
- Environmental Toxicology. Undergraduate and graduate, 3 semesters.
- Teaching Assistant and Undergraduate Teaching Intern Training Workshop. Combined undergraduate and graduate, 6 sessions.

### ***Laboratory Mentor, East Carolina University***

#### *High school students*

- Alex Beaver and Margarita Anayiotou, Summer Ventures Program (high school laboratory research). Project: Neuroinflammation in a rodent model of Gulf War Illness. 2018.
- Allison Gallagher and Sophie Villani, Medical Honors Program (high school laboratory research). Project: Developmental effects of pharmaceutical pollutants in an avian model. 2017-2018.
- Sunnie Li and Alex Reulbach, Summer Ventures Program (high school laboratory research). Project: Neuroinflammation in a rodent model of Gulf War Illness. 2017.
- Matthew Clayton, high school laboratory research for the NC Science Fair. Project: Developmental effects of pharmaceutical pollutants in an avian model. 2016.
- Virginia Billings, Summer Ventures Program (high school laboratory research). Project: Developmental effects of pharmaceutical pollutants in an avian model. 2016.
- Jaein Yoon, Medical Honors Program (high school laboratory research). Project: Developmental effects of pharmaceutical pollutants in an avian model. 2015-2016.
- Chevonne Parker, Summer Ventures Program (high school laboratory research). Project: Neuronal T-cell infiltration following developmental trichloroethylene exposure. 2015.
- Catherine Taylor and Jessi Zhou, Medical Honors Program (high school laboratory research). Project: Microglial responses in an Alzheimer's mouse model developmentally exposed to lead. 2014-2015.
- Janelle Neal, Summer Ventures Program (high school laboratory research). Project: Microglial responses following inhalation exposure to natural dusts. 2014.
- Brian Alloway, Medical Honors Program (high school laboratory research). Project: Peroxisome proliferation in livers of C57BL/6 mice exposed to undecafluoro-2-methyl-oxahexanoic acid (U2M3-OHxA) gavage. 2013-2014.
- Kortney Wager, Summer Ventures Program (high school laboratory research). Project: Developmental effects of BPA on immune responses. 2013.
- Brian Ennis and Jonathan Reed, Medical Honors Program (high school laboratory research). Project: Teratogenicity of PFOS in early chicken embryos. 2012-2013.
- Willa Chen, Summer Ventures Program (high school laboratory research). Project: Developmental effects of PFOA in primary cardiomyocyte cultures from chickens. 2012.
- Elizabeth Fox and Samantha Rouse, Medical Honors Program (high school laboratory research). Project: Teratogenicity of PFOS in early chicken embryos. 2011-2012.
- Pranavi Sanka, Summer Ventures Program (high school laboratory research). Project: Developmental effects of PFOS: T cell infiltration into mouse brains. 2011.
- Erin Morris and Andrew Wood, Medical Honors Program (high school laboratory research). Project: Developmental effects of PFOA on T cell infiltration and myelin basic protein levels in mouse brains. 2010-2011.
- Jillian Loftis, Summer Ventures Program (high school laboratory research). Project: Developmental effects of PFOA on glycogen deposition in a chicken model. 2010.

- Clarissa Morrissey, Medical Honors Program (high school laboratory research). Project: Teratogenicity of PFOA in early chicken embryos. 2009-2010.
- Taylor Brundage, Summer Ventures Program (high school laboratory research). Project: Developmental teratogenic effects of PFOA in a chicken model. 2009.
- Ian Bryan, Medical Honors Program (high school laboratory research). Project: Developmental effects of PFOA on liver glucocorticoid receptor levels, and pancreatic alpha and beta cells in a mouse model. 2008-2009.

#### *Undergraduate students*

- Jeffery Ayala, and Mark Ibrahim, Program in Neuroscience (undergraduate laboratory research): Microglial morphology in a rodent model of Alzheimer's disease. 2018-.
- Payton Anders, Jeffery Ayala, and Mark Ibrahim, Program in Neuroscience (undergraduate laboratory research): Microglial morphology in a rodent model of Alzheimer's disease. 2018.
- Alexis Liberatore, Program in Neuroscience (undergraduate laboratory research): Glucocorticoid receptor expression in avian brains following developmental exposure to pharmaceutical pollutants. 2018-.
- Kathleen Ferris, Biology (undergraduate laboratory research): Peroxisome proliferation in livers of rodents exposed to aqueous film forming foam. 2018-.
- Robert Strickland, General Studies/Program in Neuroscience (undergraduate laboratory research). Project: Neuroinflammation in a rodent model of Gulf War Illness. 2017.
- Chastity Ward, Summer Biomedical Research Program (undergraduate laboratory research). Project: Immunotoxic effects of AFFF in a rodent model. 2017.
- Christopher Hamby, Multidisciplinary Studies Program in Neuroscience (undergraduate laboratory research/senior thesis advisor). Project: Microglial morphology in a rodent model of Gulf War Illness. 2016-2017.
- Ishmael Gomez, Summer Biomedical Research Program (undergraduate laboratory research). Project: DAP12 microglial signaling in a rodent model of Alzheimer's disease. 2016.
- Brianna Davidson, Multidisciplinary Studies Program in Neuroscience (undergraduate laboratory research). Project: Synaptic degeneration in a rodent model of Alzheimer's disease. 2016.
- Samuel Vance, Multidisciplinary Studies Program in Neuroscience (undergraduate laboratory research/senior thesis advisor). Project: Post-translational modifications and Alzheimer's pathology. 2015-2017.
- Waeya Lin, Summer Biomedical Research Program (undergraduate laboratory research). Project: Exacerbation of Alzheimer's pathology by prenatal exposure to lead; Dystrophic microglia. 2015.
- Giovana Fernanda Cosi Bento, Brazil Scientific Mobility Program (undergraduate laboratory research). Project: Exacerbation of Alzheimer's pathology by prenatal exposure to lead; Synaptosomes. 2015.
- Zoe Hinton, Multidisciplinary Studies Program in Neuroscience (undergraduate laboratory research/senior thesis advisor). Project I: Exacerbation of Alzheimer's pathology by prenatal exposure to lead; Synaptosomes. 2015. Project II: Microglial morphology in a rodent model of Gulf War Illness. 2016-2017.
- Andrew Wood, Biology (undergraduate honors thesis advisor). Project: Exacerbation of Alzheimer's pathology by prenatal exposure to lead; Measurement of amyloid beta. 2014-2015.
- Dakota Johnson, Biology (undergraduate honors thesis advisor). Project: Exacerbation of Alzheimer's pathology by early-life exposure to lead; Measurement of amyloid beta. 2013-2014.
- Sydney Henry, Summer Biomedical Research Program (undergraduate laboratory research). Project: Neurotoxic effects of dust collected from the Nellis Dunes Recreation Area. 2014.
- Andrew Wood, Biology undergraduate student. Project: Developmental effects of BPA on serum IL-4 and IgG. 2013.

- Dominique Baldwin, Biology undergraduate student. Project: Neurotoxic effects of dust collected from the Nellis Dunes Recreation Area. 2013.
- Megan Biller, Summer Biomedical Research Program (undergraduate laboratory research). Project: Microglia in Alzheimer's-prone triple transgenic mice. 2013.
- Blake Rushing, Summer Biomedical Research Program (undergraduate laboratory research). Project: Blood distribution, urinary excretion, and T cell-dependent immunotoxicity of undecafluoro-2-methyl-oxahexanoic acid (U2M3-OHxA) in C57BL/6 mice exposed via gavage. 2012.
- Alvin-Ming-Yun Tsang, Psychology (undergraduate honors thesis advisor). Project: Developmental effects of nanoparticles in a rodent model. 2011-2012.
- Nick Creech, Summer Biomedical Research Program (undergraduate laboratory research). Project: Immunological effects of PFOA on a T-cell independent antigen (DNP-Ficcol) in an adult mouse model. 2010-2011.
- Hatel Patel, Biochemistry undergraduate student. Project 1: Developmental effects of PFOA on liver peroxisomes proliferation in a chicken model. Project 2: Effects of PFOA on myelin basic protein levels in the brains of developmentally-exposed mice. 2009.
- Ian Bryan, Biology and Chemistry undergraduate student. Project: Developmental effects of PFOA and PROS in a chicken model, including early embryo teratogenesis and hatchling glycogen levels. 2009-2012.

#### *Master's students*

- Samuel Vance, Biomedical Sciences Master's Student. Project: Immunotoxicological effects of PFMOAA, a contaminant of emerging concern in the Cape Fear River. 2018-
- Carmen Davis, Environmental Health Master's Student. Project: Developmental effects of Triclosan in an avian model. 2015-2016.
- Cory Boles, Biomedical Sciences Master's Student. Project: Exacerbation of Alzheimer's pathology by early-life exposure to lead. 2013-2015.
- Annalise vonderEmbse, Biomedical Sciences Master's Student. Project: Exacerbation of Alzheimer's pathology by early-life exposure to lead; Effects on microglia. 2012-2014.

#### *Doctoral students*

- Jacqueline Meadows, Pharmacology and Toxicology Ph.D. Student. Project: Developmental effects of pharmaceutical pollutants in an avian model. 2015-
- Annalise vonderEmbse, Pharmacology and Toxicology Ph.D. Student. Project: Exacerbation of Alzheimer's pathology by early-life exposure to lead; Effects on microglia. 2014-2017. Currently a postdoctoral trainee with Dr. Pam Lein at the University of California-Davis.
- Jason Franklin, Pharmacology and Toxicology Ph.D. Student. Project: Developmental neuroimmunotoxicity of bisphenol a in a rodent model. 2010-2014. Currently a postdoctoral trainee in neurotoxicology at the U.S. Environmental Protection Agency.
- Qixiao Jiang, Pharmacology and Toxicology Ph.D. Student. Project: Developmental cardiotoxicity of perfluorinated compounds in an avian model. 2009-2013. Currently an assistant professor at Qingdo University.

#### *Medical students*

- Amie McPherson and Danesh Ghiassi, Medical students. Project: Isolation and stimulation of regulatory T cells from spleens of PFOA-exposed mice. 2009.

### ***Advisory, East Carolina University***

- Heidi Knecht, Public Health Ph.D. Student (Dissertation committee; Advisor: Stephanie Richards). 2018-

- Megan Rhyne, Environmental Health and Health Education & Promotion Master's Student (Thesis committee; Advisor: Stephanie Richards). 2018.
- Dariel Hoppersberger, Microbiology and Immunology Ph.D. Student (Dissertation committee; Advisor: Marty Roop). 2018-
- Alexandra Hayes, Microbiology and Immunology Master's Student (Thesis committee; Advisor: Rachel Roper). 2018-
- Kayla DeOca, Microbiology and Immunology Ph.D. Student (Dissertation committee; Advisor: Mark Mannie). 2018-
- Henry Raab, Coastal Resource Management Ph.D. Student (Dissertation committee; Advisor: Joe Luczkovich). 2017-
- Khoa Do, Biomedical Sciences Master's Student (Thesis committee; Advisor: Hu Huang). 2016-2017.
- John Atkinson, Biology Master's Student (Thesis committee; Advisor: David Rudell). 2015-2016.
- Blake Rushing, Pharmacology and Toxicology Ph.D. Student (Dissertation committee; Advisor: Mustafa Selim). 2015-2018.
- Ahmed Aldhafiri, Pharmacology and Toxicology Ph.D. Student (Dissertation committee; Advisor: Ken Soderstrom). 2014-
- Jason Hoggard, Biomedical Sciences Master's Student (Thesis committee; Advisor: Lance Bridges). 2014-2015.
- Matthew Edwards, Biology Master's Student (Thesis committee; Advisor: Krista McCoy). 2014-2015.
- Bevin Blake, Biology Master's Student (Thesis committee; Advisor: Krista McCoy). 2013-2015.
- Anastasia Weeks, Microbiology and Immunology Master's Student (Thesis committee; Advisor: Mark Mannie). 2013-2017.
- Samar Rezq, Pharmacology and Toxicology Ph.D. Student (Dissertation committee; Advisor: Abdel Abdel-Rahman). 2013-2016.
- Partha Nagchowdhuri, Pharmacology and Toxicology Ph.D. Student (Dissertation committee; Advisor: Brian McMillen). 2013-
- Suelen Demor, Biology Ph.D. Student (Dissertation committee; Advisor: David Chalcraft). 2013-2017.
- Tessa Holland, Pharmacology and Toxicology Ph.D. Student (Dissertation committee; Advisor: Ken Soderstrom). 2013-
- Samantha Sellers, Anatomy and Cell Biology Ph.D. Student (Dissertation committee). 2013.
- Alvin Ming-Yun Tsang, Psychology Undergraduate Student (Honors Thesis Advisor). 2011-2012.
- Abdullah Aldossari, Pharmacology and Toxicology Ph.D. Student (Dissertation committee; Advisor: Jared Brown). 2011-2018.
- Michael Smith, Biology Master's Student (Thesis committee; Advisor: Xiaoping Pan). 2010-2011.
- Pranita Katwa, Pharmacology and Toxicology Ph.D. Student (Dissertation committee; Advisor: Jared Brown). 2009-2012.

## **PROFESSIONAL SERVICE**

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### ***Scientific Community***

- President, Society of Toxicology Immunotoxicology Specialty Section. 2018-present.
- Co-Chair, Introduction to Immunotoxicity Testing continuing education course, 2018 Annual Meeting, Society of Toxicology, San Antonio, TX. 2018.
- Member, Society of Toxicology Career Resource and Development Committee. 2018-present.
- Member, Global PFAS Science Panel. 2017-present.
- Member, Society of Toxicology Specialty Section Collaboration and Communication Group. 2017-present.

- Vice-President, Society of Toxicology Immunotoxicology Specialty Section. 2017-2018.
- Program Planning Committee, Volunteers Sub-committee, 2017 Annual Meeting, Society of Environmental Toxicology and Chemistry. 2016-2017.
- Vice-President Elect, Society of Toxicology Immunotoxicology Specialty Section. 2016-2017.
- Program Committee Member, Society of Toxicology Immunotoxicology Specialty Section. 2015-2016.
- Moderator for Toxicology, Epidemiology, and Human Health section, FLUOROS 2015 meeting, Golden, CO. 2015.
- Program Planning Committee, 2015 Annual Meeting, Society of Environmental Toxicology and Chemistry. 2014-2015.
- Senior Councilor, Immunotoxicology Specialty Section Society of Toxicology. 2014-2015.
- Past-President, North Carolina Society of Toxicology. 2014-2015.
- Junior Councilor, Immunotoxicology Specialty Section Society of Toxicology. 2013-2014.
- President, North Carolina Society of Toxicology. 2013-2014.
- Appointed Member, Research Funding Committee, Society of Toxicology. 2012-2014.
- Vice President, North Carolina Society of Toxicology. 2012-2013.
- Vice President-Elect, North Carolina Society of Toxicology. 2011-2012.
- Program Committee Member, Society of Toxicology Immunotoxicology Specialty Section. 2010-2011.
- Councilor, North Carolina Society of Toxicology. 2009-2011.
- Workshop co-chair and organizer, "Is Modulation of the Immune System by Perfluoroalkyl Acids a Human Health Concern?" Society of Toxicology Annual Meeting, Baltimore, MD. 2009.
- Symposium co-chair and organizer, "Immune Biomarkers in Alternative Species: Implications for Risk Assessment," Society of Toxicology Annual Meeting, Charlotte, NC. 2007.
- Platform session co-chair, "Immunotoxicology: Immune Modulation and Cell Specific Responses," Society of Toxicology Annual Meeting, Charlotte, NC. 2007.
- Postdoctoral Representative and Program Committee member, Immunotoxicology Specialty Section of the Society of Toxicology. 2005-2007.
- Mentor, Association of Women in Science Program (WISP) Mentoring Project, Office of Women's Affairs, Indiana University, Bloomington, IN. 2000-2002.
- Student Board Member, Ohio Valley Chapter of Environmental Toxicology and Chemistry. 2000-2001.

### ***Workplace Community***

- LCME Steering Committee and Co-Chair of Academic Environment Sub-Committee, Brody School of Medicine, East Carolina University, 2018-present.
- Department of Comparative Medicine Promotion and Tenure Committee, Brody School of Medicine, East Carolina University, 2017-present.
- Committee member, Coastal Strategic Planning Committee, East Carolina University, 2016-2017.
- BSOM Promotion and Tenure Committee, Brody School of Medicine, East Carolina University, 2015-present.
- Secretary/Treasurer, Brody Women Faculty Committee. 2015-2017.
- Committee member, Planning committee for the joint PhD program in Integrated Coastal and Marine Sciences, East Carolina University. 2015-2017.
- Committee member, School of Dental Medicine Admissions Committee, East Carolina University, 2014-present.
- Committee member, BSOM Sustainability Committee, Brody School of Medicine, East Carolina University, 2014-2016.
- Committee member, BSOM Research Committee, Brody School of Medicine, East Carolina University. 2014-2015.

- Five-Year Review Committee for Dean Paul Cunningham, Dean of the Brody School of Medicine (appointed by the Vice Chancellor for Health Sciences). 2014.
- Committee member, Institutional Animal Use and Care Committee. 2013-present.
- M1 Curriculum Committee member, Brody School of Medicine, East Carolina University. 2013-2016.
- Master Educator Committee member, Brody School of Medicine, East Carolina University. 2012-2016.
- Chair, Brody Women Faculty Committee. 2012-2013.
- Group member, Brody Vision, Innovation, Achievement (VIA) group. 2011-2015.
- Undergraduate Research and Creative Activity Biomedical Sciences Grant Review Committee. 2011-present.
- Chair-elect, Brody Women Faculty Committee. 2011-2012.
- Committee member, Coastal Maritime Council, East Carolina University. 2010-present.
- Five-Year Review Committee for Dr. David Taylor, Chair of the Department of Pharmacology and Toxicology (appointed by the Dean of the School of Medicine). 2010.
- Committee member, Shared Resources Committee, Brody School of Medicine, East Carolina University. 2008-2012.
- Faculty of the Interdisciplinary Doctoral Program in Biological Sciences, East Carolina University. 2009-present.
- Committee member, Brody Women Faculty Committee, East Carolina University. 2008-present.
- Graduate Faculty, Division of Research and Graduate Studies, East Carolina University. 2008-present.
- Vice-President and at-large member, EPA RTP Networking and Leadership Training Organization, USEPA. 2004-2008.
- Organizing committee member, 2007 NIEHS Biomedical Career Fair. 2006-2007.
- Executive committee member/Vice-chair, Environmental Science program representative, Association of SPEA Ph.D. Students, School of Public and Environmental Affairs, Indiana University. 2001-2002.
- Environmental Science program representative, Dean's Student Advisory Committee, School of Public and Environmental Affairs, Indiana University. 1997-2002.

### **Other**

- Science Olympiad (regional) Event C-Coordinator, "Potions and Poisons." 2018.
- Science Event Co-Coordinator, "ADdMe to Tox Town," Girl Scouts TechnoQuest Event. 2017.
- Science Event Co-Coordinator, "Biometry in Action," Brody Girl's STEM Day. 2016.
- Science Event Coordinator, "The Water Cycle," Youth Ocean Conservation Summit. 2016.
- STEM volunteer, various events, Love a Sea Turtle, NC Estuarium Sound Rivers. 2015-present.
- Science Event Coordinator, "Marshmallow Genetics" and "DNA Necklaces," ECU Girl's STEM Day. 2014-2016.
- Scientific Expert, Alzheimer's North Carolina fundraising walk, Washington, NC. 2014-2016.
- Über Judge, Blue Heron Bowl, Regional Competition for the National Ocean Sciences Bowl. 2012.
- Judge, North Carolina Region 1 Science and Engineering Fair. 2010. 2011.
- North Carolina Estuarium Docent. 2009-present.