

John S. House, M.Stat., Ph.D.

EDUCATION

- Ph.D. – Molecular & Cellular Toxicology, North Carolina State University, Raleigh, NC
- Masters in Statistics, North Carolina State University, Raleigh, NC
- Bachelor of Science in Organismal and Systems Biology, University of Tennessee, Knoxville, TN

EXPERIENCE

Staff Scientist, 10/15/2019 – Present

National Institute of Environmental Health Sciences, RTP, NC

Staff Scientist, 10/15/2018 – 10/14/2019

North Carolina State University, Raleigh, NC

Senior Research Scholar, 10/01/2018 – 10/13/2019

North Carolina State University, Raleigh, NC

Research Scholar, 01/19/2016 – 10/01/2018

North Carolina State University, Raleigh, NC

Postdoctoral Fellow, 07/08/2011 – 01/15/2016

National Institute of Environmental Health Sciences, Research Triangle Park, NC

Graduate Research Associate (Master), 08/15/2006 – 07/01/2011

North Carolina State University, NC

Director of Forecasting, 2002 - 2006

William Carter Company, GA

Solution Architect / Senior Consultant, 2000 - 2002

Experio Solutions, GA

Senior Statistician, 1998 - 2000

Michelin Tire Corporation, SC

Staff Scientist, 10/15/2019 – Present

BCBB; National Institute of Environmental Health Sciences, RTP, NC

Responsibilities:

- Establishment of the PEGS GWAS pipeline with Adam Burkholder
- Covid19 Modeling utilizing machine learning for the NIEHS pandemic vulnerability index (PVI) dashboard

- Collaboration with NCSU on identification and validation of the “imprintome”
- Collaborations with EPA bioinformatic methods and analyses characterizing cross-tissue expression profiles due to Ozone exposures and dietary interventions
- Collaborations with Santa Clara University on effects of nanoparticle exposures in HepG2 cells
- Transcriptomic dose-response modeling. Utilizing downsampling to characterize tradeoffs in cost versus discovery
- GWAS and meta-analyses of resistance hypertension in the ACCORD cohort and 5 others
- Teaching short courses in R at NIEHS, and bioinformatic/toxicology lectures at NCSU
- Published 9 peer reviewed journal articles with 3 in review

Staff Scientist, 10/01/2018 – 10/15/2019

North Carolina State University, Raleigh, NC

Responsibilities:

- Developed data science methods and analyses for the Texas A&M Superfund Data Science Team
- Elucidated the role of maternal nutrition on offspring CpG methylation and on offspring behaviors
- Lead database project management for the Newborn Epigenetic Study (NEST) integrating across multiple PIs and sub-studies for Aim 3 of R24 grant
- Elucidated the roles of C/EBP β in cell survival and cancer biology
- Elucidation of ozone-mediated inflammatory signaling through HPA axis requires intact adrenal glands for differential gene expression in brain
- Provided bioinformatic support for the Center for Human Health and the Environment (CHHE). Developing methods and visualization of multiple Omics technologies for CHHE members
- Assisted Reproductive Technology and differential methylation of the imprinted control regions of genes
- Delivered invited lectures on Computational Environmental Sciences and Toxicology, Food Toxicology, Mechanisms of Hepatic Toxicology, and Maternal Dietary Influences on Offspring Epigenetics and Behavior
- Writing and editing research manuscripts for publication. Published 8 peer-reviewed journal articles

Research Scholar, 01/19/2016 – 10/01/2018

North Carolina State University, Raleigh, NC

Responsibilities:

- Researched associations of maternal diet on epigenetic programming and child behavior in the NEST
- Developed pipeline analysis of genotoxic dose responses utilizing targeted RNA-seq technology in R (<https://github.com/jshousephd/HT-CBA>)
- Analyzed effects of ozone-induced pulmonary injury with and without adrenal stress hormones in rats
- Developed analytical methods for high-dimensional, high-throughput assessment of toxicological injury in induced pluripotent stem cells
- Developed high-throughput chemical mixtures assessment and biological read-across for petroleum mixtures
- Served as poster judge for the NC Society of Toxicology (2018)
- Served as grant reviewer for Center for Human Health and the Environment (2016-2019)
- Chaired Symposium Planning Committee, Center for Human Health and the Environment, NCSU (2016/2017)
- Delivered invited lectures on Current Events in Toxicology, Food Toxicology, and High-Throughput Dose Response Modeling with Targeted Sequencing. Biospyder
- Published 8 peer-reviewed journal articles

Postdoctoral Fellow, 07/08/2011 – 01/15/2016

National Institute of Environmental Health Sciences, Research Triangle Park, NC

Responsibilities:

- Conducted epidemiological research on the life-long protective effects of early-life farming exposures on allergic disease
- Developed new genetically engineered mouse program (London Lab) to investigate human genome-wide association (GWA) identified single-nucleotide polymorphisms for pulmonary function
- Elucidated causal mechanistic roles for GWA identified genes (*HTR4* & *LRP1*) in pulmonary function
- Served on Steering Committees for 2014/15 Lung Respiratory Biology Group and 2014/15 NIEHS Career Fair
- Supervised and guided undergraduate intern from North Carolina State University, who is currently an MD - Ph.D. student at the University of Miami Miller School of Medicine
- Participated in DNA-day instruction in rural public high schools (2012/2013)
- Delivered an invited lectures on genome-wide association study

Graduate Research Associate (Master), 08/15/2006 – 07/01/2011

North Carolina State University, NC

Responsibilities:

- Studied the critical roles of C/EBP α and C/EBP β , two bZIP transcription factors on epidermal stratified squamous differentiation and sebocyte differentiation
- Investigated the interplay between C/EBPs and p53 in skin cancer signaling
- Conducted extensive wet lab experiments using skills detailed in “Technical Skills”

CONFERENCES

- *2018 Cardiovascular Toxicity Screening of Polychlorinated Biphenyls and Their Major Metabolites*, **Society of Toxicology, San Antonio, TX**
- *2016 Maternal Nutrition and Early Childhood Behavioral Outcomes in NEST*, **NIEHS Environmental Health FEST, NC**
- *2016 Maternal Nutrition and Early Childhood Behavioral Outcomes in NEST*, **ToxicoEpigenetics: The Interface of Epigenetics and Risk Assessment, VA**
- *2015 Raw Milk Consumption and Pulmonary Function in Adults in the Agricultural Lung Health Study*, **American Thoracic Society, Denver, CO**
- *2014 Genetic Variation in HTR4 and lung function: GWAS follow-up in mouse*, **FASEB – Lung Development, Saxton’s River, VT**
- *2014 HTR4 and lung function: GWAS follow-up in mouse*, **Visiting Pulmonary Scholars, RTP, NC**
- *2013 Htr4 Deficient Mice Exhibit Increased Airway Resistance and Altered Control of Breathing*. **Gordon Research Conference, Andover, NH**
- *2013 GWAS Follow-up in Htr4^{-/-} Mice Finds Altered Lung Function and Control of Breathing*. **Epidemiology Branch Review**
- *2011 C/EBP α and C/EBP β are Required for Sebocyte Differentiation and Stratified Squamous Differentiation in Adult Mouse Skin*. **9th International Skin Carcinogenesis Conference, University Park, PA**
- *2011 C/EBP α and C/EBP β are Required for Sebocyte Differentiation and Stratified Squamous Differentiation in Adult Mouse Skin*. **Graduate Research Symposium**
- *2010 C/EBP α and C/EBP β are Determinates of Skin Carcinogenesis and are Essential Regulators of Keratinocyte and Sebocyte Differentiation*. **Society of Toxicology, Salt Lake City, UT**

INVITED TALKS

- *Your Children are what You Eat? Associations of Maternal Diet with Offspring Behavior*. NIEHS, RTP, NC 2019

- *Maternal Dietary Influences on Offspring Epigenetics and Behavior*. Eastern Carolina University, Greenville, NC. 2018
- *High-Throughput Dose Response Modeling with Targeted Sequencing*. Biospyder. Carlsbad, CA. 2017
- *TempO-Seq for Dose-Response Expression Experiments*. Triangle Statistical Genetics Conference. 2016
- *Use of ENCODE tools and genome browsers to generate hypothesis*. Toxicology Department. North Carolina State University, Raleigh, NC. 2015
- *Genetic and Exposure Influences on Pulmonary Function and Atopy in Humans*. Hudson Alpha Institute for Biotechnology, Huntsville, AL. 2015
- *C/EBP α and C/EBP β are Determinates of Skin Carcinogenesis and are Essential Regulators of Keratinocyte and Sebocyte Differentiation*. Society of Toxicology Platform Session Speaker. 2010

MENTORING

- Adrian Green – North Carolina State University post-doctoral researcher, on Bioinformatics and machine learning for his K99/R00 application
- Mentor for Harlyn Skinner – post-doctoral research at North Carolina State University, on machine learning and analysis methods in R as she applies for pathway to independence award. Am also a mentor for the Diversity Supplement (R01MD011746-S2) she was awarded
- Supervised and guided undergraduate intern from North Carolina State University who is currently an MD-Ph.D. student at the University of Miami Miller School of Medicine
- Supervised undergraduate (now PhD student) Dillon Lloyd, included supervision and guidance of time spent for two different PIs. Training in R, Rshiny, GRE test taking, presentations and mentoring
- PhD Committee Member - Dylan White PhD committee - Storm Track Dynamics of African Easterly Waves

TEACHING and OUTREACH

- 2020 – Development of NIEHS high school lectures emphasizing critical thinking and the Covid19 and the Pandemic Vulnerability Index
- 2020 – Basics in R lectures at NIEHS Summer Bioinformatics course
- 2019 – **Present** – Invited Lecturer – Bioinformatics in Toxicology, NCSU, NC
- 2018 – **Present** – Invited Lecturer – Computational Environmental Sciences and Toxicology, NCSU, Raleigh, NC
- 2012 – **Present** – Invited Lecturer - Mechanisms of Hepatic Toxicology, North Carolina State University, Raleigh, NC

- 2011 – **Present** – Invited Lecturer - General Hepatic Toxicology, North Carolina State University, Raleigh, NC
- 2018 Co-Instructor – Food Toxicology, North Carolina State University, Raleigh, NCSU
- 2016 Invited Lecturer – Current Events in Toxicology, North Carolina State University, Raleigh, NC
- 2016 Invited Lecturer – Food Toxicology, North Carolina State University
- 2012 Guest Lecturer – Honors Biology (GWAS), North Carolina State University, Raleigh, NC 2012, 2015 North Carolina DNA Day – NC high schools
- 2002 – 2006 – Course developer and instructor on Excel®, PowerPoint® and Word® – William Carter Company, Atlanta, GA
- 1994 – 1996 – Teaching Assistant, Department of Statistics, NCSU
- 2012 – 2015 – Tutor for high school students in chemistry, biology, and mathematics

PROFESSIONAL SERVICE AND LEADERSHIP

- 2020 NIEHS NTP Staff Scientist Search Committee
- 2019-Present – Reviewer *Toxicological Sciences*
- 2020-2021 Mentee for Harlyn Skinner
- 2019 NIEHS Epidemiology Branch Poster Judge
- 2018 NC Society of Toxicology Poster Judge
- 2016-18 Grant Reviewer for Center for Human Health and the Environment
- 2016/17 Symposium Planning Committee Chair, Center for Human Health and the Environment, NCSU
- 2014/15 Lung Respiratory Biology Group Steering Committee, NIEHS
- 2014/15 NIEHS Career Fair Steering Committee
- 2012/13 DNA day instruction in rural public high schools
- 2010 Society of Toxicology Platform Session Chair, Salt Lake City. *Gene Environmental Interactions in Carcinogenesis*
- Ongoing Journal Reviewer – *Journal of Biological Chemistry*, *American Journal of Respiratory Cell and Molecular Biology*

FUNDING

- 2019 – Principal Investigator. Seed money: \$20k to conduct WGBS whole genome bisulfite sequencing on 20 cordblood samples to investigate difference in ADHD and normative children in epigenetics

- 2018 – Co-Investigator developing distance education course in food toxicology. *Is it something I ate?* (\$5,000, NCSU).
- 2017 – Co-Investigator. *The role of C/EBP β in regulating p53 pro-apoptotic transcriptional activity in response to UVB solar radiation* (\$25,000, CHHE)

GOOGLE SCHOLAR CITATIONS

<https://scholar.google.com/citations-JohnSHouse>

PUBLICATIONS – Peer Reviewed Research Articles

1. Snow SJ, Henriquez AR, Fisher A, Vallanat B, House JS, Schladweiler MC, et al. Peripheral metabolic effects of ozone exposure in healthy and diabetic rats on normal or high-cholesterol diet. *Toxicology and Applied Pharmacology*. 2021;115427.
2. Marvel SW, House JS, Wheeler M, Song K, Zhou Y-H, Wright FA, et al. The COVID-19 Pandemic Vulnerability Index (PVI) Dashboard: Monitoring county-level vulnerability using visualization, statistical modeling, and machine learning. *Environmental Health Perspectives*. 2021;129(1):017701.
3. House JS, Grimm FA, Klaren WD, Dalzell A, Kuchi S, Zhang S-D, et al. Grouping of UVCB substances with new approach methodologies (NAMs) data. *ALTEX*. 2021;38(1):123.
4. Sakolish C, House JS, Chramiec A, Liu Y, Chen Z, Halligan SP, et al. Tissue-Engineered Bone Tumor as a Reproducible Human in Vitro Model for Studies of Anticancer Drugs. *Toxicological Sciences*. 2020;173(1):65–76.
5. Nichols CE, House JS, Li H, Ward JM, Wyss A, Williams JG, et al. Lrp1 Regulation of Pulmonary Function: Follow-up of Human GWAS in Mouse. *American Journal of Respiratory Cell and Molecular Biology*. 2020;(ja).
6. Maguire RL, House JS, Lloyd DT, Skinner HG, Allen TK, Raffi AM, et al. Associations between maternal obesity, gestational cytokine levels and child obesity in the NEST cohort. *Pediatric obesity*. 2020;e12763.
7. House JS, Bouzos E, Fahy KM, Francisco VM, Lloyd DT, Wright FA, et al. Low-Dose Silver Nanoparticle Surface Chemistry and Temporal Effects on Gene Expression in Human Liver Cells. *Small*. 2020;
8. House J, Motsinger-Reif A. Fibrate pharmacogenomics: expanding past the genome. *PHARMACOGENOMICS*. 2020;
9. Gonzalez-Nahm S, Nihlani K, S House J, L Maguire R, G Skinner H, Hoyo C. Associations between Maternal Cadmium Exposure with Risk of Preterm Birth and Low after Birth Weight Effect of Mediterranean Diet Adherence on Affected Prenatal Outcomes. *Toxics*.

2020;8(4):90.

10. Tam HW, Hall JR, Messenger ZJ, Jima DD, House JS, Linder K, et al. C/EBP β suppresses keratinocyte autonomous type 1 IFN response and p53 to increase cell survival and susceptibility to UVB-induced skin cancer. *Carcinogenesis*. 2019;40(9):1099–109.
11. Sai K, Parsons C, House JS, Kathariou S, Ninomiya-Tsuji J. Necroptosis mediators RIPK3 and MLKL suppress intracellular *Listeria* replication independently of host cell killing. *Journal of Cell Biology*. 2019;218(6):1994–2005.
12. Onel M, Beykal B, Ferguson K, Chiu WA, McDonald TJ, Zhou L, et al. Grouping of complex substances using analytical chemistry data: A framework for quantitative evaluation and visualization. *PloS one*. 2019;14(10):e0223517.
13. House JS, Hall J, Park SS, Planchart A, Money E, Maguire RL, et al. Cadmium exposure and MEG3 methylation differences between whites and African Americans in the NEST Cohort. *Environmental epigenetics*. 2019;5(3):dvz014.
14. Henriquez AR, House JS, Snow SJ, Miller CN, Schladweiler MC, Fisher A, et al. Ozone-induced dysregulation of neuroendocrine axes requires adrenal-derived stress hormones. *Toxicological Sciences*. 2019;172(1):38–50.
15. Grimm FA, House JS, Wilson MR, Sirenko O, Iwata Y, Wright FA, et al. Multi-dimensional in vitro bioactivity profiling for grouping of glycol ethers. *Regulatory Toxicology and Pharmacology*. 2019;101:91–102.
16. Burnett SD, Blanchette AD, Grimm FA, House JS, Reif DM, Wright FA, et al. Population-based toxicity screening in human induced pluripotent stem cell-derived cardiomyocytes. *Toxicology and applied pharmacology*. 2019;381:114711.
17. Wyss AB, House JS, Hoppin JA, Richards M, Hankinson JL, Long S, et al. Raw milk consumption and other early-life farm exposures and adult pulmonary function in the Agricultural Lung Health Study. *Thorax*. 2018;73(3):279–82.
18. Venkatratnam A, House JS, Konganti K, McKenney C, Threadgill DW, Chiu WA, et al. Population-based dose–response analysis of liver transcriptional response to trichloroethylene in mouse. *Mammalian genome*. 2018;29(1):168–81.
19. Sakolish C, Weber EJ, Kelly EJ, Himmelfarb J, Mouneimne R, Grimm FA, et al. Technology transfer of the microphysiological systems: a case study of the human proximal tubule tissue chip. *Scientific reports*. 2018;8(1):1–14.
20. Messenger ZJ, Hall JR, Jima DD, House JS, Tam HW, Tokarz DA, et al. C/EBP β deletion in oncogenic Ras skin tumors is a synthetic lethal event. *Cell death & disease*. 2018;9(11):1–16.
21. House JS, Mendez M, Maguire RL, Gonzalez-Nahm S, Huang Z, Daniels J, et al. Periconceptual maternal mediterranean diet is associated with favorable offspring

- behaviors and altered CpG methylation of imprinted genes. *Frontiers in cell and developmental biology*. 2018;6:107.
22. Grimm FA, Blanchette A, House JS, Ferguson K, Hsieh N-H, Dalaijamts C, et al. A human population-based organotypic in vitro model for cardiotoxicity screening. *Altex*. 2018;35(4):441.
 23. House JS, Wyss AB, Hoppin JA, Richards M, Long S, Umbach DM, et al. Early-life farm exposures and adult asthma and atopy in the Agricultural Lung Health Study. *Journal of Allergy and Clinical Immunology*. 2017;140(1):249–56.
 24. House JS, Grimm FA, Jima DD, Zhou Y-H, Rusyn I, Wright FA. A pipeline for high-throughput concentration response modeling of gene expression for toxicogenomics. *Frontiers in genetics*. 2017;8:168.
 25. House john, Nichols C, Huiling L, Brandenberger C, Virgincar R, Miller L, et al. Vagal Innervation is Required for Pulmonary Function Phenotype in Htr4^{-/-} Mice. *Am J Physiol Lung Cell Mol Physiol*. 2017;
 26. Henriquez A, House J, Miller DB, Snow SJ, Fisher A, Ren H, et al. Adrenal-derived stress hormones modulate ozone-induced lung injury and inflammation. *Toxicology and applied pharmacology*. 2017;329:249–58.
 27. London S, Hoppin JA, Wyss A, House JS, Henneberger PK, Umbach DM, et al. House dust endotoxin levels are associated with adult asthma in the agricultural lung health study. In: *A106 EPIDEMIOLOGY AND RISK FACTORS OF ASTHMA: FROM THE CRIB TO ADULTHOOD*. American Thoracic Society; 2016. p. A2781–A2781.
 28. House JS, Li H, DeGraff LM, Flake G, Zeldin DC, London SJ. Genetic variation in HTR4 and lung function: GWAS follow-up in mouse. *The FASEB Journal*. 2015;29(1):323–35.
 29. Graves JP, Gruzdev A, Bradbury JA, DeGraff LM, Li H, House JS, et al. Quantitative polymerase chain reaction analysis of the mouse Cyp2j subfamily: Tissue distribution and regulation. *Drug Metabolism and Disposition*. 2015;43(8):1169–80.
 30. London SJ, Gao W, Gharib SA, Hancock DB, Wilk JB, House JS, et al. ADAM19 and HTR4 variants and pulmonary function: cohorts for heart and aging research in genomic epidemiology (CHARGE) consortium targeted sequencing study. *Circulation: Cardiovascular Genetics*. 2014;7(3):350–8.
 31. Thompson EA, Zhu S, Hall JR, House JS, Ranjan R, Burr JA, et al. C/EBP α expression is downregulated in human nonmelanoma skin cancers and inactivation of C/EBP α confers susceptibility to UVB-induced skin squamous cell carcinomas. *Journal of investigative dermatology*. 2011;131(6):1339–46.
 32. House J, others. Simultaneous Removal of C/EBP α and C/EBP β Reveals Their Critical Roles in Sebocyte and Keratinocyte Differentiation. 2011;

33. House JS, Zhu S, Ranjan R, Linder K, Smart RC. *C/EBP α* and *C/EBP β* are required for sebocyte differentiation and stratified squamous differentiation in adult mouse skin. *PLoS One*. 2010;5(3):e9837.
34. Ewing SJ, Zhu S, Zhu F, House J, Smart R. *C/EBP β* represses p53 to promote cell survival downstream of DNA damage independent of oncogenic Ras and p19 Arf. *Cell Death & Differentiation*. 2008;15(11):1734–44.