OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.

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|  |
| --- |
| NAME: Hood, Darryl Brice |
| eRA COMMONS USER NAME (agency login): DBHOOD |
| POSITION TITLE: Associate Professor |

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)*

|  |  |  |  |
| --- | --- | --- | --- |
| INSTITUTION AND LOCATION | DEGREE(if applicable) | Completion Date MM/YYYY | FIELD OF STUDY |
| Johnson C. Smith University | BS | 05/1985 | Biology/Chemistry |
| East Tennessee State University | PHD | 08/1990 | Biomedical Science/Biochemistry |
| Vanderbilt University School of Medicine, Nashville, TN | Postdoctoral Fellow | 03/1994 | Molecular Toxicology/Biophysics |

### A. Personal Statement

My laboratory has been interrogating hypotheses on the mechanisms of environmental exposure-induced developmental neurotoxicity for 2-decades. Our studies have been timely and have shed novel information on the health consequences associated with *in utero* exposures to benzo(a)pyene during critical developmental stages. The seminal work conducted in our laboratory demonstrated for the first time, the functional impact of *in utero* benzo(a)pyrene exposure on later-life endophenotypes mediated by maturing glutamatergic cortical circuits. From our work, the field has learned that postnatal brain development requires input from the environment in order to induce the release of glutamate and thereby promote critical aspects of synaptic maturation. Our most impactful paper demonstrated that it is during the process of postnatal synaptogenesis (P1-P14) that the effects of *in utero* benzo(a)pyrene exposure on neural activity alter the temporal expression of glutamatergic-driven genes towards a behavioral deficit phenotype.

We are also actively committed to advancing Citizen Science and community engagement activities in vulnerable Southern Gateway communities in Columbus, Ohio where disparate health outcomes are concentrated in a community located in close proximity to industrial smokestack emissions. Implementation of our recently described *Public Health Exposome* framwork will addresses modalities to dampen these disparate health outcomes. Our systems analytics tool chain will provide an alternate approach to determine relevant associations with disparate health outcomes in this minority community. Our approach integrates modern methods of processing and synthesizing information with efficient mathematical and statistical algorithms for predictive modeling and uncertainty analysis. This innovative approach will enable forecasting disparate health outcomes for other like communities in the US towards the implementation of multilevel intervention strategies.

### B. Positions and Honors

Positions and Employment

|  |  |
| --- | --- |
| 1981 - 1985 | MARC Honors Undergraduate Research Trainee, Johnson C. Smith University, NIGMS MBRS/MARC, Charlotte, NC |
| 1986 - 1990 | MARC Predoctoral Fellow, East Tennessee State University, NIGMS MARC, Johnson City, TN |
| 1990 - 1994 | NSF Minority Postdoctoral Fellow, Vanderbilt University School of Medicine, Center in Molecular Toxicology, Nashville, TN |
| 1994 - 2000 | Assistant Professor, Meharry Medical College, Department of Family and Preventive Medicine, Nashville, TN |
| 2001 - 2005 | Associate Professor, Meharry Medical College, Department of Pharmacology, Nashville, TN |
| 2005 - 2008 | Associate Professor, Meharry Medical College, Department of Neurobiology and Neurotoxicology, Nashville, TN |
| 2008 - 2008 | Adjunct Associate Professor, Vanderbilt University School of Medicine, Department of Pharmacology, Nashville, TN |
| 2008 - 8/2013 | Professor, Meharry Medical College, Department of Neuroscience and Pharmacology, Nashville, TN |
| 8/2013 -  | Associate Professor, College of Public Health, The Ohio State University, Columbus, OH |

Other Experience and Professional Memberships

|  |  |
| --- | --- |
| 1995 -  | Member, Society of Toxicology |
| 2000 -  | Member, Society of Neuroscience |
| 2001 -  | Reviewer, Toxicology and Applied Pharmacology  |
| 2001 -  | Chair, NINDS Health Disparities Working Group on Cognitive and Emotional Health in Children, Environmental and Pharmacological Pollutants |
| 2002 -  | Reviewer, Toxicological Sciences |
| 2003 -  | Member, National Environmental Justice Advisory Council, USEPA |
| 2005 -  | Reviewer, NeuroToxicology |
| 2005 -  | Member, ATSDR environmental exposure assessment team |
| 2007 -  | Member, CDC-ATSDR Environmental Health, Health Services and Toxicology Research Program Research Advisory Committee |
| 2009 -  | Reviewer, Toxicology |
| 2009 -  | Editorial Board, NeuroToxicology |
| 2009 -  | Member, NIEHS Environmental Health Sciences Review Committee |
| 2009 -  | Member, USEPA Science Advisory Board, Exposure and Human Health Committee |
| 2011 -  | Reviewer, Chemosphere |
| 2011 -  | Reviewer, Neurochemistry International |
| 2011 -  | Reviewer, Toxicology Letters |
| 2012 -  | Reviewer, Environmental Health Perspectives |
| 2012 -  | Reviewer, Environmental Practice |
| 2013 -  | Reviewer, PLOS1 |
| 2014 -  | Reviewer, Community Medicine |

Honors

|  |  |
| --- | --- |
| 1981 - 1985 | MARC Honors Undergraduate Research Trainee, Johnson C. Smith University, NIGMS MBRS/MARC, Charlotte, NC |
| 1986 - 1990 | MARC Predoctoral Fellow, East Tennessee State University, NIGMS MARC, Johnson City, TN |
| 1990 - 1994 | NSF Minority Postdoctoral Fellow, Vanderbilt University School of Medicine, Center in Molecular Toxicology, Nashville, TN |
| April, 2000 | Alpha Phi Alpha Merit Award, Mentorship Award, Meharry Medical College, School of Graduate Studies and Research |
| March, 2013 | Finalist, Best 2012 Article in Developmental and Reproductive Toxicology, Society of Toxicology |
| August, 2014 | Academic Keys 2014, Who's Who in Health Sciences Higher Education |

### C. Contribution to Science

1. **Development of *in utero* benzo(a)pyrene experimental exposure model systems.** Beginning in 2000, I led a team that designed, fabricated and tested nose-only inhalation experimental model systems for application to understand the effects in utero exposure to benzo(a)pyrene during critical windows of central nervous system development. These studies uncovered novel information on the health consequences associated with in utero exposures to benzo(a)pyene [B(a)P] during critical developmental stages.
	1. Hood DB, Nayyar T, Ramesh A, Greenwood M, Inyang F. Modulation in the developmental expression profile of Sp1 subsequent to transplacental exposure of fetal rats to desorbed benzo[a]pyrene following maternal inhalation. Inhal Toxicol. 2000 Jun;12(6):511-35. PubMed PMID: [10880142](http://www.ncbi.nlm.nih.gov/pubmed/10880142/).
	2. Ramesh A, Greenwood M, Inyang F, Hood DB. Toxicokinetics of inhaled benzo[a]pyrene: plasma and lung bioavailability. Inhal Toxicol. 2001 Jun;13(6):533-55. PubMed PMID: [11445891](http://www.ncbi.nlm.nih.gov/pubmed/11445891/).
	3. [Laknaur A](http://www.ncbi.nlm.nih.gov/pubmed/?term=Laknaur%20A%5BAuthor%5D&cauthor=true&cauthor_uid=26358852), [Foster TL](http://www.ncbi.nlm.nih.gov/pubmed/?term=Foster%20TL%5BAuthor%5D&cauthor=true&cauthor_uid=26358852), [Bobb LE](http://www.ncbi.nlm.nih.gov/pubmed/?term=Bobb%20LE%5BAuthor%5D&cauthor=true&cauthor_uid=26358852), [Ramesh A](http://www.ncbi.nlm.nih.gov/pubmed/?term=Ramesh%20A%5BAuthor%5D&cauthor=true&cauthor_uid=26358852), [Ladson GM](http://www.ncbi.nlm.nih.gov/pubmed/?term=Ladson%20GM%5BAuthor%5D&cauthor=true&cauthor_uid=26358852), [Hood DB](http://www.ncbi.nlm.nih.gov/pubmed/?term=Hood%20DB%5BAuthor%5D&cauthor=true&cauthor_uid=26358852), [Al-Hendy A](http://www.ncbi.nlm.nih.gov/pubmed/?term=Al-Hendy%20A%5BAuthor%5D&cauthor=true&cauthor_uid=26358852), [Thota C](http://www.ncbi.nlm.nih.gov/pubmed/?term=Thota%20C%5BAuthor%5D&cauthor=true&cauthor_uid=26358852). Altered expression of histone deacetylases, inflammatory cytokines and contractile-associated factors in uterine myometrium of Long Evans rats gestationally exposed to benzo(a)pyrene. J. Appl. Toxicol. 2015 PMID: 26358852.
	4. Wu J, Ramesh A, Nayyar T, Hood DB. Assessment of metabolites and AhR and CYP1A1 mRNA expression subsequent to prenatal exposure to inhaled benzo(a)pyrene. Int J Dev Neurosci. 2003 Oct;21(6):333-46. PubMed PMID: [12927582](http://www.ncbi.nlm.nih.gov/pubmed/12927582/).
2. **First time demonstration of the functional impact of *in utero* environmental contaminant exposure on later-life behavioral phenotypes mediated by maturing glutamatergic cortical circuits**. From our work, the field has learned that postnatal brain development requires input from the environment in order to induce the release of glutamate and thereby promote critical aspects of synaptic maturation. Our most impactful paper to date demonstrated that it is during the process of postnatal synaptogenesis (P1- P14) that the effects of in utero B(a)P exposure on neural activity alter the temporal expression of glutamatergic genes.
	1. Wormley DD, Ramesh A, Hood DB. Environmental contaminant-mixture effects on CNS development, plasticity, and behavior. Toxicol Appl Pharmacol. 2004 May 15;197(1):49-65. PubMed PMID: [15126074](http://www.ncbi.nlm.nih.gov/pubmed/15126074/).
	2. Wormley DD, Chirwa S, Nayyar T, Wu J, Johnson S, Brown LA, Harris E, Hood DB. Inhaled benzo(a)pyrene impairs long-term potentiation in the F1 generation rat dentate gyrus. Cell Mol Biol (Noisy-le-grand). 2004 Sep;50(6):715-21. PubMed PMID: [15641162](http://www.ncbi.nlm.nih.gov/pubmed/15641162/).
	3. Hood DB, Woods L, Brown L, Johnson S, Ebner FF. Gestational 2,3,7,8-tetrachlorodibenzo-p-dioxin exposure effects on sensory cortex function. Neurotoxicology. 2006 Dec;27(6):1032-42. PubMed PMID: [16839606](http://www.ncbi.nlm.nih.gov/pubmed/16839606/).
	4. McCallister MM, Li Z, Zhang T, Ramesh A, Clark RS, et al. [Revealing Behavioral Learning Deficit Phenotypes Subsequent to in utero Exposure to Benzo(a)pyrene.](http://www.ncbi.nlm.nih.gov/pubmed/26420751) Toxicological Sciences. 2015 Sept; 13: 1-13. PMID: 26420751
3. **First time demonstration of fetal basis of adult disease (FeBAD) *in utero* exposure to benzo(a)pyrene** for a restricted time period (E14-E17) being sufficient to generate long-term perturbations in thalamo-cortical synaptic drive and disruptions in primary somatosensory functions with associated behavioral learning and memory deficits.
	1. McCallister MM, Maguire M, Ramesh A, Aimin Q, Liu S, Khoshbouei H, Aschner M, Ebner FF, Hood DB. Prenatal exposure to benzo(a)pyrene impairs later-life cortical neuronal function. Neurotoxicology. 2008 Sep;29(5):846-54. PubMed PMID: [18761371](http://www.ncbi.nlm.nih.gov/pubmed/18761371/); PubMed Central PMCID: [PMC2752856](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2752856/).
	2. Ford GD, Ford BD, Steele EC Jr, Gates A, Hood D, Matthews MA, Mirza S, Macleish PR. Analysis of transcriptional profiles and functional clustering of global cerebellar gene expression in PCD3J mice. Biochem Biophys Res Commun. 2008 Dec 12;377(2):556-61. PubMed PMID: [18930027](http://www.ncbi.nlm.nih.gov/pubmed/18930027/); PubMed Central PMCID: [PMC2628286](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2628286/).
	3. Sheng L, Ding X, Ferguson M, McCallister M, Rhoades R, Maguire M, Ramesh A, Aschner M, Campbell D, Levitt P, Hood DB. Prenatal polycyclic aromatic hydrocarbon exposure leads to behavioral deficits and downregulation of receptor tyrosine kinase, MET. Toxicol Sci. 2010 Dec;118(2):625-34. PubMed PMID: [20889680](http://www.ncbi.nlm.nih.gov/pubmed/20889680/); PubMed Central PMCID: [PMC2984527](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2984527/).
	4. Li Z, Chadalapaka G, Ramesh A, Khoshbouei H, Maguire M, Safe S, Rhoades RE, Clark R, Jules G, McCallister M, Aschner M, Hood DB. PAH particles perturb prenatal processes and phenotypes: protection from deficits in object discrimination afforded by dampening of brain oxidoreductase following in utero exposure to inhaled benzo(a)pyrene. Toxicol Sci. 2012 Jan;125(1):233-47. PubMed PMID: [21987461](http://www.ncbi.nlm.nih.gov/pubmed/21987461/); PubMed Central PMCID: [PMC3243744](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3243744/).
4. **Translational-community engagement health disparities research**. I have actively committed to community engagement activities in Nashville, TN and Columbus, Ohio where disparities exist in the risk of death from pregnancy complications including infant mortality and preterm low-birth weight babies. Progress towards amelioration of this significant public health problem continues to be stilted. Implementation of our newly described public health exposome paradigm addresses modalities to dampen these disparate health outcomes. Our systems analytics tool chain provides an alternate approach to determine associations with disparate health outcomes. Our approach does so by integrating modern methods of processing and synthesizing information with efficient mathematical and statistical algorithms for predictive modeling and uncertainty analysis. This innovative approach will enable forecasting disparate health outcomes for vulnerable Columbus, OH communities to assist in the prioritization of intervention strategies in a manner that is dramatically more accurate than current approaches.
	1. Chen CK, Bruce M, Tyler L, Brown C, Garrett A, Goggins S, Lewis-Polite B, Weriwoh ML, Juarez PD, Hood DB, Skelton T. Analysis of an environmental exposure health questionnaire in a metropolitan minority population utilizing logistic regression and Support Vector Machines. J Health Care Poor Underserved. 2013 Feb;24(1 Suppl):153-71. PubMed PMID: [23395953](http://www.ncbi.nlm.nih.gov/pubmed/23395953/); PubMed Central PMCID: [PMC4061745](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4061745/).
	2. Langston MA, Levine RS, Kilbourne BJ, Rogers GL, Kershenbaum AD, Baktash SH, Coughlin SS, Saxton AM, Agboto VK, Hood DB, Litchveld MY, Oyana TJ, Matthews-Juarez P, Juarez PD. Scalable combinatorial tools for health disparities research. Int J Environ Res Public Health. 2014 Oct 10;11(10):10419-43. PubMed PMID: [25310540](http://www.ncbi.nlm.nih.gov/pubmed/25310540/); PubMed Central PMCID: [PMC4210988](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4210988/).
	3. Juarez PD, Matthews-Juarez P, Hood DB, Im W, Levine RS, Kilbourne BJ, Langston MA, Al-Hamdan MZ, Crosson WL, Estes MG, Estes SM, Agboto VK, Robinson P, Wilson S, Lichtveld MY. The public health exposome: a population-based, exposure science approach to health disparities research. Int J Environ Res Public Health. 2014 Dec;11(12):12866-95. PubMed PMID: [25590101](http://www.ncbi.nlm.nih.gov/pubmed/25590101/).
	4. Yuqin Jiao, Wansoo Im, Nicholas Basta, John Obrycki et al., Development of Educational PPGIS Risk-Communication Tools and Application to Evaluating Urban Soils J J Commun Med. 2015, 1(1): 007. <http://jacobspublishers.com/index.php/journal-of-community-medicine-current-edition>

5. **Achieving workforce diversity and citizen science issues.** My career has been guided by the release of two documents that have since had a dramatic impact on the scientific research and training agenda in the United States. The first document was the U.S. Surgeon General’s Report Healthy People 2000, and the second was the National Science and Technology Council’s (NSTC) report entitled Ensuring a Strong U.S. Scientific, Technical and Engineering Workforce in the 21st Century. These documents were directed at meeting the challenges of increasing the pool of well-trained Ph.D. students in minority groups where the proportion is strikingly lower than the percentage of U.S. citizens. The NIH programs having the most substantive impact on my undergraduate and graduate journeys were the Minority Biomedical Research Support and Minority Access to Research Careers-Honors Undergraduate Research Training Programs. The National Science Foundation’s EE Just Fellowship Program funded my postdoctoral research and represented a significant milestone in my career development.

* 1. Townsel JG, Hood DB. A challenge for the new millennium: eliminating health disparities and achieving educational and workforce diversity. Environ Health Perspect. 2000 Nov;108(11):A492-3. PubMed PMID: [11102305](http://www.ncbi.nlm.nih.gov/pubmed/11102305/); PubMed Central PMCID: [PMC1240171](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1240171/).
	2. Stokes SC, Hood DB, Zokovitch J, Close FT. Blueprint for communicating risk and preventing environmental injustice. J Health Care Poor Underserved. 2010 Feb;21(1):35-52. PubMed PMID: [20173254](http://www.ncbi.nlm.nih.gov/pubmed/20173254/).
	3. Robinson PL, Dominguez F, Teklehaimanot S, Lee M, Brown A, Goodchild M. Does distance decay modelling of supermarket accessibility predict fruit and vegetable intake by individuals in a large metropolitan area. J Health Care Poor Underserved. 2013 Feb;24(1 Suppl):172-85. PubMed PMID: [23395954](http://www.ncbi.nlm.nih.gov/pubmed/23395954/); PubMed Central PMCID: [PMC3767292](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3767292/).
	4. Jiao, Y, Bower JK, Im W, Basta N, Obrycki, Al-Hamdan M, Wilder A, Bollinger CE, Zhang T, Hatten L, Hatten, J, Hood DB Application of Citizen Science Risk Communication Tools in a Vulnerable Urban Community. Int. J. Environ. Res Public Health. 2015 12; doi:10.3390 ISSN 1660-4601

Complete List of Published Work in My Bibliography:
<http://www.ncbi.nlm.nih.gov/myncbi/darryl.hood.1/bibliography/47478749/public/?sort=date&direction=ascending>

**D. Research Support**

Ongoing Research Support

Start-up package, The Ohio State University

Hood, Darryl Brice (PI) 06/01/13-06/30/16

***Strategies in Risk Communication to Reduce Disparate Health Outcomes***

This pilot has served as a proof-of-concept for pooling and characterizing the interactions from multiple environmental exposures in vulnerable populations to improve our ability to quantify the impact of place-based exposures on disparate health outcomes.

Role: PI

Completed Research Support

R56 ES017448-01A1, National Institute of Environmental Health Sciences

Hood, Darryl Brice (PI) 09/18/10-08/31/12

***Mechanisms of Inhaled B(a)P-Induced Neurotoxicity***

Role: PI

S11ES014156-05, National Institute of Environmental Health Sciences

Hood, Darryl Brice (PI) 09/18/06-06/30/12

***Mechanisms of Polycyclic Aromatic Hydrocarbon Toxicity***

Role: PI

3P20 MD000516, National Institute of Minority Health Disparities

Juarez, Paul (PI) 12/01/11-11/30/13

***Environmental Context of Health Disparities***

The goal of this project is to use a trans-disciplinary/ecological or systems approaches that move beyond conventional exposure-disease paradigms towards creating an environmental core that takes into consideration effects of the built, social, and policy environments. This core focuses on developing targeted interventions, programs to inform policy towards protecting the publicÃ¢ÂÂ™s health from environmental exposure. Role: Co-I

NRC-27-10-515, Nuclear Regulatory Commission

Hood, Darryl Brice (PI) 09/01/10-08/31/13

***Long-term Educational and Research Interventions for the NRC***

The ultimate goal of activities conducted under this award are to model the systemic consequences of nuclear fallout during development using 14C-B(a)P-aerosol exposure, finite element analysis and homogenization. These activities are conducted with Y12 National Security Complex scientists.

Role: PI

no number, Simons Foundation

Levitt, Pat (PI) 07/01/09-06/30/13

***Behavioral and Physiological Consequences of Disrupted MET Signaling***

The goal of this study was to determine how gene-environment interactions contribute to the etiology of increasing the risk for autism spectrum disorder. Role: Co-Investigator