OMB No. 0925-0001 and 0925-0002 (Rev. 09/17 Approved Through 03/31/2020)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
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NAME: Hood, Darryl B.

eRA COMMONS USER NAME (credential, e.g., agency login): dbhood

POSITION TITLE: Associate Professor of Environmental Health Sciences

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

| INSTITUTION AND LOCATION | DEGREE | Completion Date | FIELD OF STUDY |
| --- | --- | --- | --- |
| Johnson C. Smith University, Charlotte, NC | B.S. | 1985 | Biology/Chemistry  |
| East Tennessee State University, Johnson City, TN | Ph.D. | 1990 | Biomedical Science |
| Vanderbilt Univ. School of Medicine, Nashville, TN | Postdoctoral | 1994 | Environmental & Molecular Toxicology  |

# Personal Statement

My role as an Associate Professor of Environmental Health Sciences at The Ohio State University provided the context for contextualizing, as co-architect, the *Public Health Exposome* framework. Perhaps nationwide implementation this framework will be my most meaningful contribution to the *Academy* in the health disparities arena. Our novel exposure science, life-course framework is expected to stimulate discovery as the *innovative science of health disparities*. This framework was designed to interrogate hypotheses focused on determining if there are associations between the built, natural and social environment and chemical/non-chemical stressors with disparate health outcomes in vulnerable populations. The present NHLBI P01 Program Project Grant (PPG) initiative PAR-18-405 provides the opportunity to demonstrate the utility of our framework. The vehicle that we propose to use as an anchor to study a bench to trench cardio-metabolic disparate health outcome reality is the Southern Cohort Community Study (SCCS). This specific NHLBI PPG opportunity provides an opportunity to leverage SCCS participants to interrogate multiple synergistic hypotheses leading to increased cardio-metabolic risk. Since the SCCS represents the largest (73,700) African American cohort within a 12-state region predominantly in the southern US, it seemed appropriate that our 25-member ***I****nterdisciplinary* ***C****ardio-metabolic* ***E****xposome* ***Tea****m* be referred to as (**ICE Tea**). The ICE-Tea has published a series of 11-articles over the past 5-years to demonstrate that the *Public Health Exposome* framework represents a novel approach that compliments conventional epidemiological approaches towards unraveling complex associations between the natural, physical, built & social environment and disparate health outcomes in vulnerable populations. As PI of this effort, it is exciting to be at the forefront of an opportunity that will juxtapose the SCCS with the Framingham Heart Study to estimate the extent to which chemical and non-chemical stressors modify the incidence of cardio-metabolic disease at the population level. We fully expect that the collective finding from our PPG this will result in a new cumulative risk assessment model that will be predictive for incidence of cardio-metabolic disease risks over time and space. Listed in the sections below are sample publications that highlight my experience and qualifications for serving as PI of this initiative. In addition to being co-architect of the *Public Health Exposome* framework, I have previously received over $11.2 million dollars of research funding from 1994-Present.

**B. Positions and Honors**

Positions and Employment

|  |  |
| --- | --- |
| 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 -Present | Associate Professor, Division of Environmental Health Sciences, College of Public Health & Department of Neuroscience, College of Medicine, The Ohio State University, Columbus, OH |

**Honors**

1981-1985 NIGMS MBRS/MARC Honors Undergraduate Research Trainee

1990 -1992 NIGMS MARC Pre-doctoral Fellowship

1990-1994 NSF Minority (EE Just) Postdoctoral Fellow, Center in Molecular Toxicology, Vanderbilt University School of Medicine, Nashville, TN

1990-1994 National Science Foundation, Minority (EE Just) Postdoctoral Fellowship

2000 Alpha Phi Alpha Fraternity Inc. Merit Award (Chi Chapter);

Mentorship Award, MMC, School of Graduate Studies and Research.

2001 Co-Chairman, NINDS Health Disparities Working Group on Cognitive and Emotional Health in Children, Environmental and Pharmacological Pollutants.

2003 Appointed to the National Environmental Justice Advisory Council, (NEJAC) Environmental Protection Agency, Washington, D.C.

2005 Appointed to the ATSDR environmental exposure assessment team, Anniston, AL

2007 Appointed to CDC-ATSDR Environmental Health, Health Services and Toxicology Research Program Research Advisory Committee

2008 Adjunct Associate Professor, Vanderbilt University School of Medicine, Department of Pharmacology, Nashville, TN

2009-2013 Appointed to NIEHS-Environmental Health Sciences Review Committee (EHSRC)

2009-2013 Appointed to the Environmental Protection Agency-Science Advisory Board (SAB); Exposure and Human Health Committee (EHHC)

2010-2013 Director, Initiative for Environmental-Health Disparities and Medicine

2011- Director, Environmental Context of Health Disparities Core 3P20MD000516-07S1

2012-2016 USEPA Science Advisory Board (SAB); Exposure and Human Health Committee

March, 2013 Finalist for Toxicological Sciences Best 2012 Article Award in Developmental and Reproductive Toxicology. SOT Annual Meeting, San Antonio, TX

May, 2014 Subject matter expert on Toxicant Emissions, NPR at WOSU

Sept, 2014 Selected for inclusion in the Academic Keys 2014 Who's Who in Health Sciences Higher Education

Oct. 2014 Member, Perinatal Brain Injury Development and Focus Group,

Nov. 2014 Nominated and selected for participation in The Compact for Faculty Diversity Institute on Teaching and Mentoring, Southern Regional Education Board, Atlanta, GA.

Dec. 2014 Elected to Editorial Board of Community Medicine

Jan. 2015 Nominated and selected for inclusion in the Academic Keys, 2014 Who's Who in Health Sciences Higher Education (WWHSHE)

May, 2014-15 Moderator, Health Professionals Summit, The Ohio State University Longaberger Alumni House

April, 2016 Moderator; The Summit on Homelessness: College of Public Health, MPHSA

October, 2016 Moderator; Provost Discovery Themes Lecture; David Satcher, M.D., PhD.

March, 2017 Elected Vice-President, Toxicologist’s of African Origin, Society of Toxicology

Nov. 2017 Keynote Speaker; Preparing for the Professorate Retreat, Office of Diversity and Inclusion, Mohican State Park, The Ohio State University

# C. Contribution to Science

1. **Conceptualization of the *Public Health Exposome* framework.** 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* framework that 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. Juarez PD, **Hood DB**, Rogers GL, Baktash SH, Saxton AM, Matthews-Juarez P, Im W, Cifuentes MP, Phillips CA, Lichtveld MY, Langston MA. A novel approach to analyzing lung cancer mortality disparities: Using the exposome and a graph-theoretical toolchain. *Environ Dis* 2017; 2: 33-44. PMID: 29152601
	2. Clark, RS, Pellom, ST, Booker, B, Ramesh, A, Zhang, T, SHanker, A, Maguire, M, Juarez, P, Matthews-Juarez, P, Langston, M., Lichtveld, M. and **Hood, DB**. Validation of research trajectory 1 of an Exposome framework: Exposure to benzo(a)pyrene confers enhanced susceptibility tobacterial infection." *Environ Res*. Vol. 146, 2016: p173-184. PubMed PMID: 26765097
	3. 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/)
	4. 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/)
2. **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/).
3. **First time demonstration of the functional impact of *in utero* benzo(a)pyrene 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
4. **First time demonstration that *in utero* exposure to benzo(a)pyrene during a critical developmental window** (E14-E17) is sufficient to generate long-term perturbations in thalamo-cortical synaptic drive and disruptions in primary somatosensory functions with associated behavioral learning and memory deficits. **(FeBAD)**
	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/).
5. **Achieving workforce diversity, citizen science and environmental justice.** 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.
6. 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/).
7. John F. Obrycki, Tyler Serafini, Darryl B. Hood, Chris Alexander, Pam Blais, Nicholas T.

Basta. Using Public Health Data for Soil Pb Hazard Management. *Ohio J Public Health Manag. Pract.* 2017 Jan 11. doi: 10.1097/PHH.0000000000000488. [Epub ahead of print] PMID: 28079647

1. 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/).
2. Jiao Y, Bower JK, Im W, Basta N, Obrycki J, Al-Hamdan MZ, Wilder A, Bollinger CE, Zhang T, Hatten

L Sr, Hatten J, Hood DB. *Int J Environ Res Public Health*. 2016 Dec 22;13(1): ijerph13010011. doi:

10.3390/ijerph13010011. PMID:26703664

**Complete List of Published Work in My Bibliography:** I have authored over 116 refereed journal articles, refereed conference papers, book chapters and other works. Roughly 85% are chronicled by PubMed. <http://www.ncbi.nlm.nih.gov/myncbi/darryl.hood.1/bibliography/47478749/public/?sort=date&direction=ascending>

# D. Research Support

# Ongoing Research Support

The Ohio State University

6/1/2013-6/30/2017

Start-up package

Award number 60053175

Ohio Bureau of Workers Compensation

Olorunfemi T. Adetona (PI) 06/01/2016-06/30/2018

***Occupational exposure of structural firefighters and cancer risk***

The goal of the award is to identify biomarkers in serological samples from Structural and Wildland firefighters.

Co-I

G17D112354237 Hood, DB MPI

USEPA STAR 1/1/18-06/30/21

***Using a Total Environmental Framework to Assess Life-long Effects of Chemical Exposures***

The goal of this proposal is to assess the latent, combined, cumulative and interactive effects of PM2.5 and heat metrics, together with other chemical and non-chemical stressors from the natural, built, and social environments, and inherent personal characteristics, activities, and behaviors, on the progression of health disparities over time and space.

Multiple-PI

**Recently Completed Research Support**

3P20 MD000516-07S1 (Juarez/Mouton) 12/1/2011-11/30/2015

NIMHD

***Environmental Context of Health Disparities***

The goal of this project is to use a transdisciplinary or systems approach that moves beyond conventional

exposure disease paradigms by taking into account the built social, and policy environments.

Role: Co-Director

Simons Foundation (Levitt) NCE 7/1/2013-6/30/2014

***Behavioral and Physiological Consequences of Disrputed 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-I