OMB No. 0925-0001 and 0925-0002 (Rev. 10/2021 Approved Through 01/31/2026)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.  
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Lewis, Freeman Chris

eRA COMMONS USER NAME (credential, e.g., agency login): FLEWIS017

POSITION TITLE: Graduate Assistant

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  (if applicable) | Completion Date  MM/YYYY | FIELD OF STUDY |
| --- | --- | --- | --- |
| University of California, Davis | BS | 08/2013 | Physiological Psychology (Neurology, Physiology, and Behavior) |
| Tulane University | MPH | 08/2022 | Social, Behavioral, and Population Sciences |
|  |  |  |  |
| Florida International University | PhD | Expected 08/2026 | Environmental Health Sciences (Brain, Behaviors, and the Environment) |
|  |  |  |  |

1. **Personal Statement**

Having been born in Oakland, California, and later spending seven formative years in San Francisco (2015-2022), I have been deeply influenced by environments that are at the forefront of both technological innovation and public health. My experiences in these vibrant communities have shaped my commitment to advancing public health, particularly within underrepresented populations. Growing up as an African American male in professional environments where individuals like me are significantly underrepresented has driven my dedication to promoting diversity and inclusion, especially in the field of aging research. The NIA’s R36 Aging Research Dissertation Award to Promote Diversity offers a unique opportunity to further my commitment to enhancing diversity within the scientific community while pursuing impactful research on aging. My academic journey, encompassing a BS in Physiological Psychology from the University of California Davis, an MPH in Social Behavioral and Population Sciences from Tulane University, and ongoing Ph.D. studies in Environmental Health Sciences at Florida International University, has been guided by a passion for addressing the complex interactions between brain, behavior, and the environment, particularly as they relate to aging. Throughout my research career, I have focused on understanding how environmental factors contribute to aging-related diseases and disparities in health outcomes. My work at Calico Life Sciences and Genentech honed my skills in experimental design, data generation, and molecular biology, particularly in the context of neurodegenerative diseases. These experiences have provided me with a solid foundation in understanding the biological mechanisms underlying aging and the potential for therapeutic interventions. My current research focuses on investigating the environmental determinants of cognitive decline, specifically the impact of neurotoxic metal exposure on cognitive aging. This research is crucial for understanding the higher prevalence of neurodegenerative diseases among African American communities and identifying intervention strategies that can reduce these health disparities. The R36 award would enable me to further explore these issues, contributing valuable insights into the environmental influences on aging and developing evidence-based interventions to improve health outcomes for diverse aging populations.

My long-term career goal is to become a leading researcher in the field of environmental health and aging, with a focus on reducing health disparities among underrepresented populations. I am committed to a career that combines rigorous scientific research with public health advocacy, aiming to translate my findings into policies and interventions that can make a tangible difference in the lives of aging individuals, particularly those in marginalized communities. After completing my Ph.D., I plan to pursue a postdoctoral fellowship where I can continue to refine my expertise in aging research and environmental health. I aim to secure a faculty position at a research-intensive university, where I will lead interdisciplinary research initiatives that address the complex interplay between environmental exposures and aging. My research will focus on uncovering the biological mechanisms through which environmental factors contribute to cognitive decline and other age-related conditions, with the goal of developing targeted interventions to mitigate these effects. I am particularly interested in the NIA’s focus on understanding the heterogeneity of aging and the factors that contribute to health disparities among older adults. My research aligns with the FOA’s emphasis on examining the role of environmental exposures in aging processes and addressing the disproportionate burden of age-related diseases in minority populations. I am passionate about contributing to this field and believe that my work will provide critical insights into how we can improve health outcomes for all aging individuals, particularly those from underrepresented groups. By aligning my research and career goals with the objectives of the NIA R36 award, I seek to make meaningful contributions to aging research that address both scientific and social challenges. As a recipient of this award, I am eager to advance my research capabilities, contribute to the academic community’s understanding of aging, and ultimately work towards reducing health disparities in aging populations through evidence-based interventions.

1. **Positions, Scientific Appointments, and Honors**

**Positions and Scientific Appointments**

*(List in reverse chronological order)*

1. **Data Manager**  
   *World Trade Center Health Program - Florida (WTCHP-FL Cohort Study)*  
   *2023 – Present*
   * Participating in studies analyzing health outcomes of 9/11 responders, focusing on cognitive impairment and aging-related diseases.
2. **Graduate Assistant**  
   *Florida International University, Miami, FL*  
   *08/2022 – Present*
   * Conducting research in Environmental Health Sciences, with an emphasis on neurotoxic metal exposure and its effects on cognitive aging.
3. **Principal Research Associate**  
   *Calico Life Sciences (Alphabet Company), South San Francisco, CA*  
   *09/2015 – 07/2022*
   * Led experimental research in neurodegenerative diseases, focusing on molecular biology and aging mechanisms. Developed in vivo models and conducted drug target engagement studies.
4. **Research Scientist Intern**  
   *Genentech, South San Francisco, CA*  
   *06/2020 – 08/2021*
   * Conducted research on Alzheimer’s disease, focusing on behavioral studies and molecular biology. Gained expertise in immunohistochemistry and in vivo pharmacology.
5. **Junior Specialist**  
   *University of California, Davis, Department of Psychiatry and Behavioral Neuroscience (MIND Institute)*  
   *2012 – 2015*
   * Conducted assessments of animal health and performed behavioral assays, including ultrasonic vocalizations in transgenic models of Autism. Prepared experimental data for publication.
6. **Undergraduate Lab Research Assistant**  
   *University of California, Davis, Department of Comparative Neurobiology*  
   *2012 – 2013*
   * Performed neuroimaging techniques and conducted behavioral assays on Prairie Voles. Collected blood samples and handled brain dissection for experimentation.

**Honors and Awards**

* **University Graduate School Inclusion Fellow**  
  *Florida International University, Robert Stemple College of Public Health and Social Work*  
  *Fall 2022 – Summer 2025*
  + Awarded for promoting inclusion in graduate education through a competitive fellowship.

**C. Contributions to Science**

**1. Environmental Determinants of Cognitive Aging**

My research focuses on understanding the impact of environmental neurotoxic exposures on cognitive aging, particularly in minority populations. Through advanced metabolomic and lipidomic techniques, I have contributed to identifying biomarkers and metabolic pathways influenced by exposure to neurotoxic metals like manganese. This work advances the understanding of neurodegenerative conditions in exposed populations and highlights the role of environmental factors in cognitive decline.

* **Lewis F, Shoieb D, Azmoun S, et al.** *Metabolomic and Lipidomic Analysis of Manganese-Associated Parkinsonism: A Case-Control Study in Brescia, Italy*. MedRxiv [Preprint]. September 6, 2024. Available from: <https://doi.org/10.1101/2024.09.04.24313002>.

**2. Health Disparities in Aging Populations**

I have contributed to a study examining health disparities among 9/11 responders who relocated to Florida, focusing on cognitive impairment and aging-related conditions. This work is part of the World Trade Center Health Program (WTCHP), where we analyze the complex interaction between disaster-related trauma, aging, and health outcomes in this vulnerable population.

* **Borisenko N, Marquez R, Lewis F, et al.** *Profile of a Growing Subcohort of the World Trade Center Health Program Residing in the State of Florida*. [In Review].

**3. Neurodegenerative Disease Mechanisms**

I have contributed to research exploring the molecular mechanisms underlying neurodegenerative diseases, including Alzheimer’s. My work at Genentech and Calico Life Sciences focused on experimental models of aging and neurodegeneration, where we used molecular biology techniques to understand the progression of neurodegenerative diseases.

* **Yang M, Lewis F, et al.** *16p11.2 Deletion Syndrome Mice Display Sensory Deficits and Reduced Ultrasonic Vocalizations during Social Interactions*. *Autism Research*, 2015.
* **Yang M, Lewis F, Foley G, Crawley JN.** *16p11.2 Deletion Mice Display Cognitive Deficits in Touchscreen Learning and Novelty Recognition Tasks*. *Learning and Memory*, 2015.
* **Yang M, Lewis F, et al.** *In Tribute to Bob Blanchard: Divergent Behavioral Phenotypes of 16p11.2 Deletion Mice Reared in Same-Genotype versus Mixed-Genotype Cages*. *Physiology and Behavior*, 2015.

**4. Public Health and Environmental Exposures**

My contributions to science extend to public health research, particularly in the context of environmental exposures and their long-term impacts on health. This includes co-authoring a study on the effects of zinc and lead exposure on gut microbiome diversity, which was presented at the American Society of Nutrition Annual Conference in 2024.

* **Ayres KR, Lewis F, Mobarki HM, et al.** *Investigating the Nexus Between Zinc Intake and Blood Lead Levels on Gut Microbiome Diversity: A Secondary Analysis of NHANES Data*. Presented at the Annual American Society of Nutrition Conference, Chicago, 2024.

**5. Neurotoxicology of Metals**

I have also contributed to a book chapter on the neurotoxic effects of both heavy and essential metals on the nervous system, which regulates critical physiological functions such as respiratory, circulatory, and endocrine homeostasis. This work emphasizes the neurodegenerative consequences of metals like aluminum, arsenic, lead, mercury, and manganese, as well as the increasing importance of studying metal mixtures and their combined neurotoxicity.

* **Lewis F, Azmoun S, Shoieb D, Marquez R, Lucchini RG.** *Neurotoxicology of Metals*. In: *Nervous System and Behavioral Toxicology* [Chapter under review].

**6. Conference Presentations on Neurodegenerative and Behavioral Neuroscience**

I have presented research on neurodegenerative disease mechanisms and behavioral neuroscience at several prestigious conferences, focusing on animal models of cognitive deficits and behavioral traits in autism and neurodegeneration.

* **Yang M, Mahrt J, Lewis F, Foley G, Portmann T, Dolmetsch R, Portfors C, Crawley J.** *16p11.2 Deletion Syndrome Mice Display Ultrasonic Vocalization Deficits during Social Interactions*. Presented at the Society for Neuroscience (SfN) Annual Meeting, Washington, D.C., 2015.
* **Yang M, Lewis F, Foley G, Portmann T, Dolmetsch R, Crawley J.** *16p11.2 Deletion Mice Display Cognitive Deficits in Novelty Discrimination Tasks*. Presented at the International Meeting for Autism Research (IMFAR), Salt Lake City, Utah, 2015.
* **Yang M, Lewis F, Foley G, Crawley J.** *16p11.2 Deletion Mice Display Cognitive Deficits in Novelty Discrimination Tasks*. Presented at the International Behavioral Neuroscience Society (IBNS) Annual Meeting, British Columbia, Canada, 2015​.