

## NIH Biographical Sketch Common Form

Name: Davis, David Allen

Persistent Identifier (PID) of the Senior/Key Person: <https://orcid.org/0000-0002-9323-6180>

Position Title: Research Associate Professor, Neurology

Organization and Location: University of Miami Miller School of Medicine, Miami, FL, United States

### PROFESSIONAL PREPARATION

INSTITUTION AND LOCATION	DEGREE	Start Date	Completion Date	FIELD OF STUDY
American Board of Toxicology, Raleigh, North Carolina, United States	Other training	10/2021	11/2021	Toxicology
American Board of Registry, St. Louis, Missouri, United States	Other training	01/2016	02/2016	Molecular Diagnostics
University of Southern California, Los Angeles , California , United States	Postdoctoral Fellow	10/2009	07/2013	Gerontology
Boston University School of Medicine, Boston, Massachusetts, United States	DOCTOR OF PHILOSOPHY	09/2005	09/2009	Pathology
University of Michigan, Dearborn, Michigan, United States	BACHELOR OF SCIENCE	01/2001	08/2005	Microbiology

### Appointments and Positions

2013 - present	Research Associate Professor, Neurology, University of Miami Miller School of Medicine, Miami, FL, United States
2018 - 2024	Research Assistant Professor, University of Miami Miller School of Medicine, Miami, Florida, United States
2017 - 2018	Senior Manager, Tissue Bank, Neurology, UM Brain Endowment Bank, University of Miami Miller School of Medicine, Miami, FL, United States
2013 - 2016	Senior Research Associate, Neurology, UM Brain Endowment Bank, University of Miami Miller School of Medicine, Miami, FL, United States
2010 - 2013	NIH-NIA Postdoctoral Trainee, Davis School of Gerontology, University of California , Los Angeles, CA, United States
2009 - 2010	Postdoctoral Research Associate, Davis School of Gerontology, University of South California , Los Angeles, CA, United States
2009 - 2009	Intern- Laboratory Medicine, Boston University School of Medicine , Boston, MA, United States
2007 - 2009	NIH-NIA Predoctoral Trainee, Boston University School of Medicine , Boston, MA, United States
2004 - 2005	Student Assistant in Pathology, Karmanos Cancer Institute, Wayne State University , Detroit , MI, United States
2004 - 2005	Research Intern, Microbiology , University of Michigan, Dearborn, MI, United States

### Products

#### Products Closely Related to the Proposed Project

- Noke Durden W, Stolen MK, Garamszegi SP, Banack SA, Brzostowicki DJ, Vontell RT, Brand LE, Cox PA, Davis DA. Alzheimer's disease signatures in the brain transcriptome of Estuarine Dolphins. *Commun Biol.* 2025 Sep 30;8(1):1400. PubMed Central PMCID: [PMC12484975](https://pubmed.ncbi.nlm.nih.gov/PMC12484975/).
- The GTEx Consortium atlas of genetic regulatory effects across human tissues. *Science.* 2020 Sep 11;369(6509):1318-1330. PubMed Central PMCID: [PMC7737656](https://pubmed.ncbi.nlm.nih.gov/PMC7737656/).
- Davis DA, Mondo K, Stern E, Annor AK, Murch SJ, Coyne TM, Brand LE, Niemeyer ME, Sharp S, Bradley WG, Cox PA, Mash DC. Cyanobacterial neurotoxin BMAA and brain pathology in stranded dolphins. *PLoS One.* 2019;14(3):e0213346. PubMed Central PMCID: [PMC6426197](https://pubmed.ncbi.nlm.nih.gov/PMC6426197/).

4. Enhancing GTEx by bridging the gaps between genotype, gene expression, and disease. Nat Genet. 2017 Dec;49(12):1664-1670. PubMed Central PMCID: [PMC6636856](#).
5. Morgan TE, Davis DA, Iwata N, Tanner JA, Snyder D, Ning Z, Kam W, Hsu YT, Winkler JW, Chen JC, Petasis NA, Baudry M, Sioutas C, Finch CE. Glutamatergic neurons in rodent models respond to nanoscale particulate urban air pollutants in vivo and in vitro. Environ Health Perspect. 2011 Jul;119(7):1003-9. PubMed Central PMCID: [PMC3222976](#).

**Certification:**

I certify that the information provided is current, accurate, and complete. This includes but is not limited to information related to domestic and foreign appointments and positions.

I also certify that, at the time of submission, I am not a party to a malign foreign talent recruitment program.

Misrepresentations and/or omissions may be subject to prosecution and liability pursuant to, but not limited to, 18 U.S.C. §§ 287, 1001, 1031 and 31 U.S.C. §§ 3729-3733 and 3802.

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**NIH BIOGRAPHICAL SKETCH SUPPLEMENT**


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**Personal Statement**

I am an experimental neuropathologist and toxicologist studying the intersection of environmental exposures and brain illnesses. I have advanced training in neuroanatomy, pathology, toxicology, and novel exposure models of disease. My primary research focuses on exposure to algal toxins, heavy metals and plastics. As the chief neuroanatomist at the University of Miami Brain Endowment Bank (UM BEB). I have managed the brain biorepository and directed the procurement and anatomical dissections of nearly 1,900 brain procurements, and have dissected more than 35,000 fresh, fixed, and frozen biospecimens for NIH NeuroBioBank (NBB) approved investigators, the Genotype-Tissue Expression (GTEx) Consortium, the Veteran Affairs Biorepository Brain Bank (VABBB), UMBEB research collaborators, and recently the (BRAIN) Initiative Cell Atlas Network (BICAN) Working Group. This includes overseeing more than 50 ultra-low freezer units and that house more than 4,000 donated brains. As the Associate Director of the Miami Brain Endowment Bank, I am well positioned and well equipped to complete the objectives proposed.

**Honors**

2018 - 2026	The Herbert W. Hoover Foundation Research Award, Herbert W. Hoover Foundation
2013 - 2016	McGowan Research Fellowship Award, University of Miami Miller School of Medicine
2010 - 2013	NIH NIA Postdoctoral Training Award, University of South California
2007 - 2009	NIH NIA Pre-Doctoral fellowship, Boston University School of Medicine

**Contributions to Science**

1. Brain Banking I direct the brain acquisition and dispensation of donated tissues to meet the demands of several federally funded projects. Of these projects, the most significant are the NIH NeuroBioBank brain and tissue repository (NBB), The Genotype Tissue Expression (GTEx) project, a NIH Roadmap Initiative, the Veteran affairs Brain Bank Biorepository (VABBB) and the BRAIN Initiative Cell Atlas Network (BICAN). I ensure uniformity and precision in organ procurement procedures, anatomical dissection, neuropathological assessment, annotation and inventory of biospecimens. To date, I have overseen the banking of over 1,000 donors for the NIH NBB, 429 donors for the GTEx project, 89 donors for the VABBB, and 8 donors for BICAN. I serve as the primary neuroanatomist providing complex dissection and imaging of brain tissues for research diagnosis and for use in laboratory studies. For example, I have dissected and distributed over 17,000 biospecimens for the NIH NBB. As the custodian of the GTEx brain collection and as a member of the GTEx Consortium, I have dissected and distributed approximately 12,700 brain biospecimens for the core analysis and an additional 2,394 biospecimens to consortium members for studies leading to numerous publications in high impact journals. In addition, our biorepository has provided countless biospecimens to qualified investigators around the world with a diverse portfolio of research interests. Listed below are examples of publications by investigators using biospecimens processed and distributed from our brain biorepository.
2. Harmful Algal Blooms and Neurodegeneration: I am investigating the cyanobacterial neurotoxin called beta-N- methylamino-L-alanine or BMAA and its structural isomers (2,4-DAB and AEG). BMAA is a non-proteinogenic amino acid that has been implicated in the high incidence of ALS in Guam. Geographical regions dense with cyanobacterial blooms have been shown to have larger clusters of ALS patients. I have detected BMAA throughout the South Florida marine food chain including in the brains, muscles and fins of dolphins and sharks. BMAA's presence in the marine food chain suggests a potential route for human exposure. BMAA can be transported across the blood brain barrier and has been detected in the brains of North Americans and Canadians with ALS and dementia. I have shown that chronic dietary exposure to L-BMAA HCl causes deposition-of pathogenic Tau and TDP-43 in the primate brain and spinal cord causing neurofibrillary tangles and motor neuron degeneration. The studies were the first to show that BMAA can trigger motor neuron disease pathology similar to ALS/PDC of Guam in a primate model.
3. Urban Air Pollution and Brain Aging My postdoctoral research with Dr. Caleb E. Finch at the Leonard Davis School of

Gerontology at USC, defined for the first time how exposure to airborne urban pollutants predisposes the brain to accelerated aging and neurodegeneration. Here, we used a novel rodent exposure and cellular models to investigate nanoparticulate matter (nPM) derived from vehicular exhaust collected from the Los Angeles I-110 Freeway. These ambient nPM particles were collected into sterile suspensions allowing for aerosolization for inhalation exposures on rodents or for direct delivery to primary neuronal and glia cultures. Using these model systems, I discovered a novel mechanism in which exposure to nPM reduces neurite sprouting and causes neuron growth cone collapse through glutamate receptor pathways. These data were the first to show direct effects of particulate matter on neuron cell physiology. Electrophysiological and histological studies also show that direct application of nPM to CA1 pyramidal neurons in acute slice cultures causes oxidative stress and loss of glutamatergic function. These data were published in several manuscripts involving urban air pollution's effect on the brain across the lifespan.

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