

UNIVERSITY OF PENNSYLVANIA – SCHOOL OF NURSING
Curriculum Vitae

DATE: JULY 2022

ANTONIO DÁVILA JR, Ph.D., M.S.

BUSINESS ADDRESS

University of Pennsylvania - Presbyterian Medical Center
Penn Acute Research Collaboration (PARC)
Mutch Building, 3rd floor, Room 310
51 N. 39th Street Philadelphia, PA 19104

HOME ADDRESS

328 N. 39th Street
Philadelphia, PA 19104

EDUCATION

- Ph.D. 2012 University of California, Irvine, School of Medicine
Doctoral Dissertation: *Investigations into the Unique Functional State of Mitochondria in Human Embryonic Stem Cells: The Development of Technologies.*
Irvine, CA: UCI Library Catalog, ISBN: 9781267843562. U.C. Irvine.
- Thesis co-Chairs: DC Wallace, Ph.D. and PJ Donovan, Ph.D.
- M.S. 2004 University of California, Irvine, CA, School of Medicine, Department of Environmental Toxicology
Thesis title "*Effusion of NO and Glutamate from Activated Microglia mediates Neurodegeneration in Alzheimer's Disease*"
- B.S. 2000 University of California, Irvine, CA major: Biological Sciences
- B.A. 2000 University of California, Irvine, CA major: Philosophy

POSTGRADUATE TRAINING & FELLOWSHIP APPOINTMENTS

- 2021 iCARECampus Gatekeeper Training Program- CAPS, U. Pennsylvania
- 2019-2020 Supervisory Skills Certification – Office of Organization Effectiveness, U. Penn.
- 2013-2016 NRSA Postdoctoral Fellow. U. Pennsylvania, Perelman School of Medicine.
NIGMS - Institutional Research and Academic Career Development Award (IRACDA) postdoctoral fellowship
- Principal advisor: Joseph A. Baur, Ph.D.
- Areas of research: Mitochondrial NAD⁺ compartmentalization; physiology and bioenergetics of aging; mitochondrial metabolite biochemistry; NO mechanism of caloric restriction

SELECTED PROFESSIONAL EXPERIENCE

- 2021 – present Assistant Professor, Clinician Educator
School of Nursing - University of Pennsylvania

2021 – present	Laboratory Director; Senior Research Investigator Penn Acute Research Collaboration (PARC) Lab – U. Pennsylvania
2019- 2020	Faculty Consultant - Phase 1 – VinGroup-Penn Alliance Project School of Nursing - University of Pennsylvania
2018- present	Instructor – Pre-Freshman Program (PFP), Penn First Plus School of Nursing - University of Pennsylvania
2016 –2021	Lab Manager / Senior Research Investigator Penn Acute Research Collaboration (PARC) Lab – U. Pennsylvania
2016- 2021	Lecturer B - Biologically Based Chemistry (NURS 061) School of Nursing - University of Pennsylvania
Spring 2016	Adjunct Professor - Biochemistry (Bio 404/604) College of Arts & Sciences - Saint Joseph’s University, Philadelphia, PA
Spring 2014	Lecturer - Cellular Bioenergetics (Bio 599) Department of Biology - Rutgers University - Camden, Camden, NJ
Fall 2013	Lecturer - Molecular Biology (Bio 305) Department of Biology - Rutgers University - Camden, Camden, NJ
Oct 2009	Lecturer - Molecular Genetics for Genetic Counselors (Ped Gen 200E) School of Medicine- University of California, Irvine- Irvine, CA
Summer 2006-2007	Lecturer - The Fundamentals of Biology (Biology 109) – 2 semesters Department of Biology - Santa Ana College - Santa Ana, CA
2006-2007	Staff Research Associate IV U.C. Irvine, Center for Molecular and Mitochondrial Medicine and Genetics (MAMMAG)
2004-2006	Staff Research Associate I U.C. Irvine, Center for Molecular and Mitochondrial Medicine and Genetics (MAMMAG)
2004-2007	Lab Instructor - Fundamentals of Biology (Biology 109L) – 6 semesters Department of Biology - Santa Ana College - Santa Ana, CA
2004	Science Instructor - Biology and Chemistry Upward Bound - Community Outreach and Opportunity Programs - Los Angeles, CA

HONORS/AWARDS/MEMBERSHIPS IN HONORARY SOCIETIES

2021	Anne Keane Teaching Award – University of Pennsylvania School of Nursing, Biobehavioral Health Sciences Department
2019	CHOP Mito-RAG Core Utilization Grant Award – Children’s Hospital of Philadelphia

2012-2016 NIH NRSA Postdoctoral Fellowship - University of Pennsylvania - Postdoctoral Opportunities in Research and Teaching (PENN-PORT) Fellowship

2010 University of California Office of the President - Dissertation Year Fellowship

2009 Ellison Medical Foundation Fellowship - MBL training course

2007-2009 NSF IGERT LifeChips Fellowship - Interdisciplinary development of biotech

2001-2003 NSF Fast Track to the Professoriate Graduate Fellowship

1999-2000 U.S. Dept. of Education - McNair Scholars Program Scholarship

PUBLICATIONS – Latest first

Journal Articles: Research, Peer Reviewed

Warneford-Thomson R, Shah PP, Lundgren P, Lerner J, Morgan J, **Davila A**, Abella BS, Zaret K, Schug J, Jain R, Thaiss CA, Bonasio R. A LAMP sequencing approach for high-throughput co-detection of SARS-CoV-2 and influenza virus in human saliva. (2022) eLife. 11:e69949. doi: 10.7554/eLife.69949

Torres MDT, de Lima LF, Ferreira AL, de Araujo WR, Callahan P, **Dávila Jr A**, Abella BS, de la Fuente-Nunez C. Detection of SARS-CoV-2 with RAPID: A prospective cohort study. (2022) iScience. 15;25(4):104055. doi: 10.1016/j.isci.2022.104055

Zamani P, Proto EA, Wilson N, Fazelinia H, Ding H, Spruce LA; **Davila A**, Hanff TC, Mazurek JA, Prenner SB, Desjardins B, Margulies KB, Kelly DP, Arany Z, Paschalis-Thomas D, Elrod JW, Allen ME, McCormack SE, Schurj GM, D'Aquila K, Kumar D, Thakuri D, Prabhakaran K, Langham MC, Poole DC, Seeholzer SH, Reddy R, Ischiropoulos H, Chirinos JA. Multimodality Assessment of HFpEF Skeletal Muscle Reveals Differences in the Machinery of Energy Fuel Metabolism. (2021) ESC Heart Failure. 8(4):2698-2712. doi: 10.1002/ehf2.13329

Zhang Z, Xu HX, Li S, **Davila A**, Chellappa K, Davis JG, Guan Y, Frederick DW, Qing W, Li LZ, Baur JA. Rapamycin maintains NAD⁺/NADH redox homeostasis in muscle cells. (2020) Aging. 12(18): 17786–17799. doi: 10.18632/aging.103954

Verni CC, **Davila A**, Sims CA, Diamond SL. D-Dimer and Fibrin Degradation Products Impair Platelet Signaling: Plasma D-Dimer Is a Predictor and Mediator of Platelet Dysfunction During Trauma. (2020) J. Appl Lab Med. 5(6):1253-1264

Verni CC, **Davila A**, Balian S, Sims CA, Diamond SL. Platelet dysfunction during trauma involves diverse signaling pathways and inhibitory activity in patient-derived plasma. (2019) J. Trauma Acute Care Surg. 86(2): 250-259

Davila A, Liu L, Chellappa K, Redpath P, Nakamaru-Ogiso E, Paoletta LM, Zhang Z, Migaud ME, Rabinowitz JD, Baur JA. Nicotinamide adenine dinucleotide is transported into mammalian mitochondria. (2018) eLIFE. 7:e33246 DOI:10.7554/eLIFE.33246

Sims CA, Gua Y, Mukherjee S, Singh K, Botolin P, **Davila A**, Baur JA. Nicotinamide mononucleotide preserves mitochondrial function and increases survival in hemorrhagic shock. (2018) JCI Insight. 3(17):e120182 DOI:10.1172/jci.insight.120182

Frederick DW, Loro E, Liu L, **Davila A**, Chellappa K, Silverman IM, Gosai SJ, Davis JG, Gregory BD, Dellinger RW, Redpath P, Migaud ME, Nakamaru-Ogiso E, Rabinowitz JD, Khurana TS, Baur JA. Loss of NAD homeostasis leads to progressive and reversible degeneration of skeletal muscle. (2016) Cell Metabolism. 24(2):269-282

Toth P, Tarantini S, **Davila A**, Valcarcel-Ares MN, Tucek S, Sonntag WE, Baur JA, Csizar A, Ungvari Z. Purinergic glia-endothelial coupling during neuronal activity: role of P2Y1 receptors and eNOS in functional hyperemia in the mouse somatosensory cortex. (2015) American Journal of Physiology: Heart and Circulatory Physiology. 309(11):H1837-45

Frederick DF, **Davila A**, Davis JG, Agarawal B, Michan S, Puchowicz MA, Nakamaru-Ogiso E, Baur JA. Increasing NAD Synthesis in muscle via nicotinamide phosphoribosyltransferase is not sufficient to promote oxidative metabolism. (2015) J. Biological Chemistry. 290(3):1546-58

Mutations of human NARS2, encoding the mitochondrial asparaginyl-tRNA synthetase, cause nonsyndromic deafness and Leigh syndrome. Simon M, Richard EM, Wang X, Shahzad M, Huang VH, Kaiser TA, Potluri P, Mahl SE, **Davila A**, Nazli S, Hancock S, Yu M, Gargus J, Chang R, Al-Sheqaih N, Newman WG, Abdenur J, Starr A, Hegde R, Dorn T, Busch A, Park E, Wu J, Schwenzer H, Flierl A, Florentz C, Sissler M, Khan SN, Li R, Guan MX, Friedman TB, Wu DK, Procaccio V, Riazuddin S, Wallace DC, Ahmed ZM, Huang T, Riazuddin S. (2015) PLoS Genetics. 25;11(3):e1005097.

Picard M, Zhang J, Hancock S, Derbeneva O, Procaccio V, Golhar R, Golik P, O'Hearn S, Levy SE, Potluri P, Lvova M, **Davila A**, Lin CS, Perin JC, Rappaport EF, Hakonarson H, Trounce I, Wallace DC. Progressive increase in mtDNA 3243A>G heteroplasmy causes abrupt transcriptional reprogramming. (2014) Proceedings of the National Academy of Sciences- USA. 111(38):E4033-42

Zand K, Pham T, **Davila A Jr**, Wallace DC, Burke PJ. Nanofluidic platform for single mitochondria analysis using fluorescence microscopy. (2013) Anal. Chem.85(12):6018-25

Davila A, Lim TS, Zand K, Wallace DC, Burke PJ. Wafer-Scale Mitochondrial Membrane Potential Assays. (2012) Lab on a Chip. 12(15):2719-25

Davila A, Wallace DC. Epigenetic Memory in the Mitochondria of Human Embryonic Stem Cells. (2012) Mitochondrion. 12(5):581-582

Ji F, Sharpley MS, Derbeneva O, Alves LS, Qian P, Wang Y, Chalkia D, Lvova M, Xu J, Simon M, Platt J, Xu S, Angelin A, **Davila A**, Huang T, Wang PH, Huang LM, Moore L, Qian G, Wallace DC. Mitochondrial DNA Variant Associated with Leber Hereditary Optic Neuropathy and High-Altitude Tibetans. (2012) Proceedings of the National Academy of Sciences- USA. 109 (19):7391-7396.

Csizar A, Podlutzky A, Podlutska N, Sonntag WE, Merlin S, Philipp E, Doyle K, **Davila A**, Recchia F, Ballabh P, Pinto JT, Ungvari Z. Testing the Oxidative Stress Hypothesis of Aging in Primate Fibroblast cell lines: Inverse Correlation between Species Longevity and Cellular ROS Production. (2012) J. Gerontology- Biological Sciences and Medical Sciences. 67(8): 811-820.

Lim TS, **Davila A**, Wallace DC, Burke P. Assessment of Mitochondrial Membrane Potential Using an On-Chip Microelectrode in a Microfluidic Device.(2010) Lab on a Chip. 10(13):1683-8

Potluri P, **Davila A**, Ruiz-Pesini E, Mishmar D, O'Hearn S, Hancock S, Simon M, Scheffler I, Wallace DC, Procaccio V. A Novel NDUFA1 Mutation leads to a Progressive Mitochondrial Complex 1-specific Neurodegenerative Disease. (2009) Molecular Genetics and Metabolism. 96(4):189-95.

Khidr L, Wu G, **Davila A**, Procaccio V, Wallace DC, Lee WH. Role of SUV3 Helicase in Maintaining Mitochondrial Homeostasis in Human Cells. (2008) J. Biological Chemistry. 283(40):27064-27073

Procaccio V, Salazar G, Ono S, Styers M, Gearing M, **Davila A**, Jimenez R, Juncos J, Gutekunst CA, Meroni G, Fontanella B, Sontag E, J Sontag JM, Faundez V, Wainer BH. A mutation of β -actin which alters depolymerization dynamics is associated with autosomal dominant developmental malformations, deafness and dystonia. (2006) American Journal of Human Genetics. 78:947-960.

Procaccio V, Neckelmann N, Paquis-Flucklinger V, Bannwarth S, Jimenez R, **Davila A**, Poole JC, Wallace DC. Detection of low levels of the mitochondrial tRNA^{Leu(UUR)} 3243A>G mutation in blood derived from patients with diabetes. (2006) Mol Diagn Ther. 2006;10(6):381-9

Abstracts [List only past three years; * indicates data based, ∞ indicates peer reviewed]

(P7439 ∞) Centering community in a dual crisis: A COVID-19 testing and overdose prevention partnership. Abdulhay N, Disch H, McFadden R, Morgan J, **Davila Jr A**, Abella B. American Public Health Association (APHA). November 2022

(P67 ∞) Delineating the metabolic basis for platelet storage lesion. **Davila A**, Hu A, Snyder NW, Sims CA. Shock. 51(6S):11-164, June 2019

(P181 ∞) A timecourse of soluble syndecan-1 expression during the first 48 hours of resuscitation in severely injured patients with hemorrhagic shock. Leonard JM, **Davila A**, Hoofnagle MH, Sims CA. Shock. 49(6S):9-142, June 2018.

(P215 ∞) Impaired NAD⁺ metabolism correlates with trauma patient injury and outcome. **Davila A**, Leonard JM, Sims CA. Shock. 49(6S):9-142, June 2018.

Contributions to peer-reviewed clinical research publications, participation cited but not by authorship

Abela BS, Jolkovsky EL, Biney BT, Upsal JE, Hyman MC, Frank I, Hensley SE, Gill S, Vogl DT, Maillard I, Babushok DV, Huang AC, Nasta SD, Walsh JC, Wiletyo EP, Gimotty PA, Milone MC, Amaravadi RK, PATCH Investigators. Efficacy and Safety of Hydroxychloroquine vs Placebo for Pre-exposure SARS-CoV-2 Prophylaxis Among Health CareWorkers: A Randomized Clinical Trial. (2020) JAMA Intern Med. doi:10.1001/jamainternmed.2020.6319

PATENTS & COPYRIGHTS

Burke P, Lim TS, **Davila A**, Wallace DC. 2011. Device and Methods for Mitochondrial Membrane Potential Assessment. U.S. Patent No.: US 8,961,759 B2 Date of Patent: Feb. 24, 2015

CONSULTATION: RESEARCH/EDUCATIONAL

School of Nursing - University of Pennsylvania - Philadelphia, PA

Faculty Consultant - Phase 1 – VinGroup -Penn Alliance Project

March 2019- July 2020

- Developed the curriculum and prepared the teaching materials to support the implementation of two distinct courses of year 1 of the BN program.
 - Chemistry / Organic chemistry Lecture + Laboratory
 - Physics / Biophysics Lecture + Laboratory

RECENT LECTURES BY INVITATION, SPEECHES AND WORKSHOPS

Invited Speaker: U.Pennsylvania School of Nursing- Ph.D. Research Day. Keynote Address. April 2022

Invited Speaker: Drexel University Migration, Ethnicity, Race and Health Working Group (MERHG) Colloquia. “With and For the Community: COVID TRACE (Testing, Resources, and Community Engagement).” Philadelphia. February 2022

Invited Speaker: U.Pennsylvania School of Nursing- Biobehavioral Research Collaborative (BRC). “Life is stressful: How platelets can be the link between chronic stress, platelet function, and trauma outcomes.” Philadelphia. January 2022.

Invited Speaker: 9th Annual Penn Medicine Nursing Research Conference. “With and For the Community: Penn COVID-19 TRACE (Testing, Resources, and Community Engagement).” Philadelphia. December 2021

Invited Speaker: Children’s Hospital of Philadelphia/ U. Pennsylvania Mitochondrial Research Affinity Group (Mito-RAG) Seminar Series. “Delineating the metabolic basis for platelet storage lesion.” Philadelphia. November 2019

Invited Speaker: The Shock Society 40th Annual Conference on Shock. “Measuring Mitochondrial Function.” Fort Lauderdale. June 2017.

Invited Speaker: Children’s Hospital of Philadelphia/ U. Pennsylvania Mitochondrial Research Affinity Group (Mito-RAG) Seminar Series. “Redox status of mitochondria: Fine-tuning the measurements of subcellular compartments of the NAD⁺/NADH couple.” Philadelphia. April 2014

Invited Speaker: United Mitochondrial Disease Foundation (UMDF) Meeting. “Epigenetic Memory in the Mitochondria of Human Embryonic Stem Cells.” Bethesda. June 2012.

Invited Speaker: Children’s Hospital of Philadelphia/ U. Pennsylvania Mitochondrial Research Affinity Group (Mito-RAG) Seminar Series. Titled, “Epigenetic Memory in the Mitochondria of Human Embryonic Stem Cells.” Philadelphia. May 2012

SELECTED PROFESSIONAL ACTIVITIES

The Philadelphia AIDS Consortium (TPAC)/ Philadelphia Department of Public Health (PDPH)

- Develooped a training program for TPAC workers to perform STI testing April 2021
 - Created a training video
 - Hosted two virtual informational and training sessions for workers, volunteers and community members.

First Generation- Low Income (FGLI) - U. Pennsylvania, Office of Provost of University Life

- CaMB: Path to Graduate School Career Panel. **Panelist**. Nov 2020
- PENN 1VYG conference. **Panelist** Feb 2018
- Undergraduate student advisor

iPRAXIS Science Fair Committee. Belmont Charter School. West Philadelphia, PA

- Led a group of five 7th grade girls to design, perform, analyze, and present a science project involving polymers and magnetism. **Mentor**. 2014-2015

CLINICAL AGENCY ACTIVITIES

PARC - Prevention Point Philadelphia (PPP): **COVID-19 Community Testing Initiative**

Principal Investigator

March 2020 – May 2022

Established a COVID-19 testing program that provides free rapid RT-PCR testing for the mostly homeless and OUD population in the Kensington section of Philadelphia

- Optimized and established CDC-compliant RT-PCR testing protocols and implemented BSL-2 enhanced laboratory safety procedures
- Organized a network of volunteer nurses from Penn, Drexel, and CCP to perform nasopharyngeal swabs and blood draws from research subjects
- Coordinated with Prevention Point Clinic and the Philadelphia Department of Public Health to provide resources (PPE, hand sanitizer, Narcan, Wawa gift cards, etc) and contact tracing
- Since May 2020, our weekly testing site has provided results and resources for hundreds of members from the community, from volunteer groups, and from city organizations