

Vasiliki Machairaki, Ph.D.

**Assistant Professor
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Citizen of USA; Citizen of Greece



Molecular and cell biologist with diverse experience; Specialized in human pluripotent stem cell line biology and human disease models. Excellent analytical, written and oral communication skills and multi-disciplinary training; Expertise in stem cell biology, developmental biology, biomedical engineering and biomaterials.

Education and Training

- 2010 Postdoctoral Fellow, Department of Pathology, Johns Hopkins University, School of Medicine, Baltimore, MD.
- 2004 Postdoctoral Fellow, Department of Molecular Microbiology and Immunology, Johns Hopkins University, Bloomberg School of Public Health, Baltimore, MD.
- 2003 Ph.D., Institute of Molecular Biology and Biotechnology (I.M.B.B), University of Crete, Greece.
- 1999 Visiting Scientist European Molecular Biology Laboratory (EMBL), Germany.
- 1996 M.Sc Department of Biology, University of Patras, Greece.

Research – Areas of interest

- Human induced Pluripotent Stem Cells (hiPSCs)
- Alzheimer's disease (AD)-specific induced Pluripotent Stem Cells (AD iPSCs)
- Neuronal Differentiation of hESCs/iPSCs from familiar AD patients
- Application of extracellular vesicles (EVs) isolated from hiPSCs and hiPSC-derived neurons in diagnostics, pathology and therapeutics.
- Nanotechnology and Tissue Engineering
- Regenerative Biology and Medicine

Technical skills

Human Embryonic Stem Cells (ESCs) / Human Induced Pluripotent Stem Cells (iPSCs)

- Maintenance of human pluripotent stem cells (ESCs and iPSCs).
- Derivation of human-derived disease-specific induced pluripotent stem cell lines using non-integrating episomal vectors (ENBA1/OriP plasmids).
- Differentiation of ESC/iPSC lines towards neural/neuronal lineage.
- Culture and maintenance of neuronal precursors derived from human ESCs/iPSCs.
- Lentiviral transduction of human pluripotent stem cell / neuronal precursor cultures.
- Culture of human ESC-derived neural precursors on biomimetic nanofibrous scaffolds.

Molecular biology

- Recombinant DNA technology: Design and construction of expression plasmids for mammalian proteins, Genomic and cDNA library screening, RNA isolation, nucleic acid labeling and detection.
- PCR, semi-Quantitative RT-PCR, gene expression profiling.
- Protein Detection / Isolation Techniques: SDS-PAGE, Western blotting.
- Immunohistochemical assays.
- Design and implementation of lentiviral vectors.
- Use of various reprogramming vectors.
- Isolation and characterization of extracellular microvesicles/exosomes derived from hiPSC and neuronal cultures.

Neuroscience

- Neuroanatomical Manipulations:
 - Chemical treatments
 - Tissue and Cell Fixation
 - Tissue Sectioning : Paraffin-embedded and frozen brain tissues
 - Staining : Histochemical; Immunohistochemical; In Situ Hybridization
- RNAi methodology in Primary Cortical / Hippocampal Neuronal Cultures :
 - synthetic oligonucleotide transfection
 - short hairpin RNAi-lentivirus infection
- Tissue culture of primary cells and cell lines (human and mouse).

Research Experience

2016 - now *Assistant Professor in Dep. of Neurology, Div. of Genetic Medicine, Johns Hopkins University, School of Medicine.*

Area of focus: Development of in vitro models of neurodegenerative disorders using human iPSCs.

- Use extracellular vesicles/exosomes derived from human iPSCs and iPSC-derived neurons as tools for biomarker discovery and therapeutic applications.
- Study at the molecular and cellular level of the contributions of extracellular vesicles to Alzheimer's.
- Develop 3D systems as novel platforms to be used as new platforms to study disease mechanisms and test new pharmacological cures.
- Work on a unique personalized medicine approach involving the development of hiPSC models for the characterization of biologic subtypes of AD.
- First-authored and co-authored publications in leading journals in the field.

2010-2016 *Research Associate in Dep. of Pathology, Div. of Neuropathology, Johns Hopkins University, School of Medicine.*

Area of focus: Development of in vitro models of neurodegenerative disorders using human iPSCs.

- Established cellular models for Alzheimer's disease using patient-derived iPSCs.
- Generation of 3D in vitro models (cerebral organoids) for the study of AD, as well as other neurodegenerative/neurodevelopmental disorders.

Area of focus: Application of extracellular microvesicles (EMVs) isolated from hiPSCs and hiPSC-derived neurons in diagnostics, pathology and therapeutics.

- Isolation and characterization of extracellular microvesicles/exosomes derived from hiPSCs and hiPSC-derived neurons.
- Study the role of EMVs in the propagation of AD pathology and assess their potential as therapeutic targets.
- Co-authored publication.

2005-2010 Postdoctoral Fellow, Department of Pathology, Johns Hopkins University, School of Medicine, Baltimore, MD.

Area of focus: Developed stem cell approaches for the study of neurodegenerative diseases, like Alzheimer's disease (AD).

- Generated of virus-free hiPSCs from fibroblasts of patients harboring mutations in genes that account for the majority of early-onset familial Alzheimer's Disease (FAD) using non-integrating episomal vectors.
- Generated of virus-free hiPSCs from fibroblasts of healthy controls using non-integrating episomal vectors.
- Designed and implemented robust protocols for the differentiation of hiPSCs towards neural/neuronal lineage.
- Research studies on the amyloidogenic properties of neurons derived from mutant hiPSC lines and their potential to serve as humanized models to test novel diagnostic methods and therapies for AD.
- First-authored publication.

Area of focus: Optimized the regulation of several functional properties of hESC-derived neurons, including polarity, survival and proliferation.

- Designed and implemented of novel nanobiotechnology methodologies for the guiding of directional growth of human embryonic stem cell-derived neurons and their axon projections along tubular biological scaffolds (nanofibers and microfibers).
- First-authored publication, presentations in international forums and an invited presentation at the annual meeting of the Materials Research Society in San Francisco, 2008.
- Awarded post-doctoral fellowship from the Maryland Stem Cell Research Fund (MSCRF) in 2008.

Area of focus: Developed and optimized methodologies for hESC cultures and neuronal differentiation. Designed RNA interference strategies to study cortical plasticity and forebrain neurogenesis.

- Developed efficient and reproducible protocols for the controlled conversion of hESCs to neural cells that showed substantial promise for the formation on functional circuits after their transplantation in the brain of animal models.
- Designed RNA interference strategies for targeted silencing in cortical interneurons to elucidate the role of nitric oxide as signal involved in cortical plasticity and repair.
- First-authored and co-authored publications in leading journals in the field.

2004-2005 Postdoctoral Fellow, Department of Molecular Microbiology and Immunology, Johns Hopkins University, Bloomberg School of Public Health, Baltimore, MD.

Area of focus: Identified gene classes in the female *An.gambiae* mosquito vector related largely to blood digestion and immunity that are involved in malaria parasite transmission processes.

- Applied functional genomics platforms for *Anopheles* mosquito research, including various microarray systems for the study of the vector transcriptome.
- Identified a number of genes related largely to blood digestion and immunity, which are highly enriched in the mosquito midgut by Affymetrix Gene Chips.
- Several first-authored and co-authored publications in top peer-reviewed journals, as well as oral and poster presentations at a variety of international scientific meetings.

2003 Doctoral Research, Institute of Molecular Biology and Biotechnology (I.M.B.B), University of Crete, Greece.

Area of focus: Developed the necessary tools for novel mosquito control strategies in the fight against malaria based on the interactions of mosquito vectors and malaria parasites

- Studied *Plasmodium* parasite transmission processes through the midgut of the *An.gambiae* mosquito vector.
- Isolated major malaria mosquito genes encoding putative receptors critical for the transmission of *P.berghei* parasites.
- First-authored and co-authored publications in leading journals in the field, oral and poster presentations at a variety of international scientific meetings.

Leadership

- **Vice Chair** of the Hellenic Initiative Against Alzheimer's (<https://hiaad.org>)
The Hellenic Initiative Against Alzheimer's aims to develop, implement and monitor a strategic translational research plan for the management of Alzheimer's disease and related disorders in Greece.
- **Johns Hopkins University Delegate** for the International Academic Partnership Program (IAPP) to support academic partnerships between U.S. universities with institutions of higher learning in Greece.

Advising activities/mentoring

- Trained, supervised and mentored undergraduate, Master's students and post-doctoral fellows.
- Mentor for the American Medical Women's Association at Johns Hopkins University School of Medicine.
- Member for a number of PhD thesis committees.
- Co-mentor of a clinical scientist for K08 Award.

Interdisciplinary Collaboration

- Established a multidisciplinary team in collaboration with experts in the field of nanobiotechnology of the Johns Hopkins Biomedical Engineering department in order to combine stem cell biology with nanotechnology based techniques and design a biodegradable, nanofiber-based scaffold for the culture of hESC-derived neurons.
- Established multiple, effective interdepartmental collaborations including Department of Genetic Medicine; Johns Hopkins Institute of Cell Engineering (ICE); Department of Neurology and Neuroscience; Department of Genetic Engineering and Molecular Ophthalmology; National Institute of Aging (NIA).

Honors / Fellowships

2008-2010 Maryland Stem Cell Research Fund (Post-doctoral Research Fellowship).
2001-2002 Scholarship of the “T.Vardinogiannis Foundation”.
1999-2003 Scholarship of the “Institute of Molecular Biology and Biotechnology”, Forth-Hellas.
1995 NATO Travel Fellowship.

Professional Memberships

- International Society for Stem Cell Research (ISSCR)
- International Society of Extracellular Vesicles (ISEV)

Awards / Funding

The Ritchman Family Precision Medicine Center of Excellence in Alzheimer’s Disease Venture Discovery Fund (VDF) (Machairaki) 7/01/2021 - 6/30/2022

Development of hiPSC-derived microglia drug screening platforms as novel precision medicine therapeutic approaches for Alzheimer’s Disease

Human induced stem cells will be differentiated into microglia to provide drug screening platforms for inflammatory-mediated neuronal injury in AD.

Role: PI

R21 AG067016 NIH (Machairaki) 2/01/2020 - 1/30/2022

A personalized medicine approach to the study of monoamine brain systems that underlie the emergence of neuropsychiatric symptoms in person with Alzheimer's disease

Human induced stem cells will be differentiated into serotonin neurons to provide novel insights at the molecular and cellular level of person-to-person differences in the development of NPS.

Role: PI

R21/R33 MH118164 NIH (Witwer/Machairaki) 9/1/2020 – 8/31/2023

Novel Approaches to Capture, Sorting, & Characterization of CNS-Origin Extracellular Vesicles

The goal is to develop new, more sensitive, and easier-to-use technologies and methods to obtain pure populations of brain-derived extracellular vesicles from human blood samples.

Role: Multiple Principal Investigator (MPI)

The Ritchman Family Precision Medicine Center of Excellence in Alzheimer’s Disease.

Private funding (Machairaki) 1/1/2018 – 12/31/2024

Work in the center will focus on a unique translational project aimed at characterizing clinical and biologic subtypes of AD relevant to treatment development.

Role: co-PI

Private Award (Witwer) 3/1/2019 – 1/30/2022

Michael J. Fox Foundation

Microglial exosomes/extracellular vesicles as novel markers of neuroinflammation in PD.

The goal of this project is to investigate microglia-derived extracellular vesicles (EVs) including exosomes and their cargo as novel markers of inflammatory process in Parkinson’s disease (PD).

Role: co-Investigator

MSCRF (Kwon) 7/01/2020 – 12/31/2021

Technology Development Corporation

Engraftment of Human iPSC Derived Neural Progenitors in mouse for developing treatments for Alzheimer’s Disease
We will study the survival and differentiation of human iPSC- NSCs in transgenic mice of AD.

Role: co-Investigator

R01 MH113215-01 (Avramopoulos)

8/3/2018 – 3/31/2022

NIH/MIMH

SZ-Associated loci: Functional Consequences & Treatment Opportunities

The major goals of this application are to perform genome editing of human pluripotent stem cells to introduce multiple schizophrenia (SZ)-associated genetic variants, differentiate them into neurons and astrocytes, determine each variant's molecular role in the disease and perform screening experiments.

Role: co-Investigator

R03 AG063101-01 (Lee)

7/1/2019 – 6/30/2021

NIH/NIMH

Optical control of tau aggregation to model Alzheimer's disease in human neurons

We will apply optogenetics methodology to study the tau aggregation in vitro

Role: co-Investigator

2018-MSCRFD-4317 (Calabresi)

1 /1/2019-12/31/2020

Transcriptional and Functional Profiling of iPSC derived A1 Astrocytes in people with Multiple Sclerosis

The goal of this project is to generate MS patient-derived astrocytes from existing iPSC lines and determine whether patient-specific gene variants predispose to neurotoxic A1 astrocyte profiles.

Role: co-Investigator

2018-MSCRFD-4237 (Hilary Vernon)

6/30/2018 - 6/30/2020

Development of an iPSC derived cellular model of Barth Syndrome: Towards novel therapeutic discovery

The goal of this proposal is to generate iPSC lines from patients with Barth Syndrome to study the development of the disease and therapeutic applications.

Role: co-Investigator

R56 AG057430 NIH (Witwer/Machairaki/Cheng)

9/30/2017 – 8/31/2019

Discovering Novel Players in Mechanisms of Extracellular Vesicle Release, Cargo Loading and Early Pathogenesis of Late Onset Alzheimer's Disease

In this study, powerful biological tools including patient-derived induced pluripotent stem cells that are differentiated into neurons and astrocytes are used to generate a better understanding at the molecular and cellular level of the contributions of extracellular vesicles to Alzheimer's. By identifying and describing the pathways of extracellular vesicle release and loading, and by probing the consequences when neurons are exposed to extracellular vesicles, our findings are expected to point the way to much-needed new therapeutic possibilities.

Role: Multiple Principal Investigator (MPI)

Lisa Dean Moseley Foundation Award (Machairaki)

2018 – 2019

Generation of 3D Brain Organoids as Novel in vitro Models for Alzheimer's Disease

The goal of this proposal is to develop 3D systems as novel platforms to study Alzheimer's Disease.

Role: PI

Sanofi Innovation Awards grant (Machairaki)

2016-2017

Generation of cortical organoids from human induces pluripotent stem cells as novel in vitro models of neurodegenerative diseases

The goal of this project is to develop methodologies for the generation of 3D in vitro systems, called cortical organoid for the study of neurodegenerative diseases.

Role: PI

2016-MSCRFE-2739 (Machairaki)

6/30/2016 – 6/29/2018

Maryland Technology Development Corporation

Human iPSC-Derived Extracellular Vesicles: Targets for Novel Diagnostic and Therapeutic Strategies for Alzheimer's Disease

The aim of this study is to use extracellular vesicles/exosomes derived from the Alzheimer's and controls human iPSC lines, as well as from healthy and AD iPSC-derived neurons as tools for diagnostic and therapeutic applications.

Role: PI

Maryland Stem Cell Research grant (Machairaki) 2014-2016

Induced Pluripotent Stem Cell Strategies to model Alzheimer's Disease

The goal of this proposal is to develop 3D cell models of AD.

Role: PI

Maryland Stem Cell Research (Koliatsos) 2010-2012

Induced Pluripotent Stem Cells as Models of Alzheimer's Disease

The goal of this proposal was to generate nerve cells with AD properties.

Role: co-Investigator

Maryland Stem Cell Research grant (Koliatsos) 2011-2014

Stem Cell Therapies in Animal Models of Traumatic Axonal Injury

The goal of this proposal is to develop stem-cell based therapies of diffuse/traumatic axonal injury.

Role: co-Investigator

Maryland Stem Cell Research fellowship grant (Machairaki) 2008-2010

Human Neural Stem Cell-biomatrix Preparations as Tools to Repair Injured Hippocampal Circuits

The goal of this study was to develop a microfiber system that permits the delivery of neural stem cells in a spatio-temporally controlled manner.

Role: PI

Scientific Reviewer

Journals

- *'Stem Cells and Development'*
- *'Stem Cell Research'*
- *'Neural regeneration'*
- *'Cellular and Molecular Neurobiology'*
- *'Journal of Experimental & Clinical Cancer Research'*
- *'Journal of Biomedical Materials Research: Part A'*
- *'Tissue Engineering'*
- *'Current Pharmaceutical Design'*
- *'Anti-Cancer Agents in Medicinal Chemistry'*
- *'Current Drug Delivery'*
- *'Frontiers in bioengineering'*

Patents

On behalf of Dr. Vasiliki Machairaki, Dr. Hao Bai and Dr. Linzhao Cheng, Johns Hopkins Technology Ventures has filed a patent application (P14035) entitled "Engineered Anucleate Cellular and Extracellular Vesicles as a Novel Biologics Delivery Platform". A provisional application was filed on May 25, 2016 and the final US application was filed in November, 2018.

Peer-reviewed Publications

1. Kim SJ, Li J, **Machairaki V**. Stem cell-derived three-dimensional (organoid) models of Alzheimer's disease: a precision medicine approach. *Neural Regen Res.* 2021 Aug;16(8):1546-1547.
2. **Machairaki V**. Human Pluripotent Stem Cells as In Vitro Models of Neurodegenerative Diseases. *Adv Exp Med Biol.* 2020;1195:93-94.

3. Constantine G, Lyketsos, Dimitrios Avramopoulos, Dimitrios Kapogiannis, Jeannie-Marie Leoutsakos, **Vasiliki Mahairaki**, Milap Nowrangi, Kenichi Oishi, Esther S. Oh, Paul B. Rosenberg, Quincy Samus, Gwenn S. Smith, Kenneth Witwer, Sevil Yasar, Peter P. Zandi. Developing Treatments for Alzheimer's and Related Disorders with Precision Medicine: A Vision (*in press*).
4. Ram Sagar, Pujita Pathak, Balint Pandur, Sujung Jun Kim, Jiabin Li, **Vasiliki Mahairaki**. Biomarkers and Precision Medicine in Alzheimer's Disease. *Advances in Experimental Medicine and Biology*, Springer (*In press*).
5. Vlachakis D, Papakonstantinou E, Sagar R, Bacopoulou F, Exarchos T, Kourouthanassis P, Karyotis V, Vlamos P, Lyketsos C, Avramopoulos D, **Mahairaki V**. Improving the Utility of Polygenic Risk Scores as a Biomarker for Alzheimer's Disease. *Cells* 2021 Jun 29;10(7):1627. doi: 10.3390/cells10071627.
6. Das D, Li J, Cheng L, Franco S, **Mahairaki V**. Human Forebrain Organoids from Induced Pluripotent Stem Cells: A Novel Approach to Model Repair of Ionizing Radiation-Induced DNA Damage in Human Neurons. *Radiat Res.* 2020 Aug 1;194(2):191-198.
7. Das D, Li J, Liu S, Cheng L, Oh E, Lyketsos C, **Mahairaki V**. Generation and characterization of a novel human iPSC line from a resilient Alzheimer's disease patient. *Stem Cell Research*. *Stem Cell Res.* 2020 Oct;48:101979.
8. Noguera-Ortiz CJ, **Mahairaki V**, Delgado-Peraza F, Das D, Avgerinos K, Eren E, Hentschel M, Goetzl EJ, Mattson MP, Kapogiannis D. Astrocyte- and Neuron-Derived Extracellular Vesicles from Alzheimer's Disease Patients Effect Complement-Mediated Neurotoxicity. *Cells.* 2020 Jul 4;9(7):1618.
9. Nauen DW, Haffner MC, Kim J, Zheng Q, Yin H, DeMarzo AM, **Mahairaki V**, Colantuoni C, Pickering JG, Johnson TP. Putative Autoantigen Leiomodin-1 Is Expressed in the Human Brain and in the Membrane Fraction of Newly Formed Neurons. *Pathogens.* 2020 Dec 10;9(12):1036.
10. Huang Y, Cheng L, Turchinovich A, **Mahairaki V**, Troncoso JC, Pletniková O, Haughey NJ, Vella LJ, Hill AF, Zheng L, Witwer KW. Influence of species and processing parameters on recovery and content of brain tissue-derived extracellular vesicles. *J Extracell Vesicles.* 2020 Jun 30;9(1):1785746.
11. Morales Pantoja IE, Smith MD, Rajbhandari L, Cheng L, Gao Y, **Mahairaki V**, Venkatesan A, Calabresi PA, Fitzgerald KC, Whartenby KA. iPSCs from people with MS can differentiate into oligodendrocytes in a homeostatic but not an inflammatory milieu. *PLoS One.* 2020 Jun 8;15(6):e0233980.
12. Huang Y, Driedonks T, Cheng L, Turchinovich A, Rajapaksha H, Arab T, Powell BH, Pletniková O, Redding J, Troncoso JC, Vella L, Zheng L, Hill AF, **Mahairaki V**, Witwer KW. Relationships of Alzheimer's disease and apolipoprotein E genotypes with small RNA and protein cargo of brain tissue extracellular vesicles. *MedRxiv* <https://doi.org/10.1101/2020.12.12.20247890>.
13. Liu S*, **Mahairaki V***, Bai H, Ding Z, Li J, Witwer KW, Cheng L#. Highly Purified Human Extracellular Vesicles Produced by Stem Cells Alleviate Aging Cellular Phenotypes of Senescent Human Cells. *Stem Cells.* 2019 Jun;37(6):779-790. doi: 10.1002/stem.2996. (*equal contribution, #co-corresponding author).
Award winning paper
14. Zhao Z, Muth DC, **Mahairaki V**, Cheng L, Witwer KW. Isolation and Characterization of Extracellular Vesicles in Stem cell-related Studies. *Stem Cell Technologies in Neuroscience, 2017 (book chapter)*.
15. Russell AE, Sneider A, Witwer KW, Bergese P, Bhattacharyya SN, Cocks A, Cocucci E, Erdbrügger U, Falcon-Perez JM, Freeman DW, Gallagher TM, Hu S, Huang Y, Jay SM, Kano SI, Lavieu G, Leszczynska A, Llorente AM, Lu Q, **Mahairaki V**, Muth DC, Noren Hooten N, Ostrowski M, Prada I, Sahoo S, Schøyen TH, Sheng L, Tesch D, Van Niel G, Vandenbroucke RE, Verweij FJ, Villar AV, Wauben M, Wehman AM, Yin H, Carter DRF, Vader P. Biological membranes in EV biogenesis, stability, uptake, and cargo transfer: an ISEV position paper arising from the ISEV membranes and EVs workshop. *J Extracell Vesicles.* 2019 Nov. 8;8(1):1684862. doi: 10.1080/20013078.2019.1684862.
16. Searson P, Katt M, Mayo L, Ellis S, **Mahairaki V**, Rothstein J, Cheng L. The role of mutations associated with familial neurodegenerative disorders on blood-brain barrier function in an iPSC model, submitted.
17. Linville RM, DeStefano JG, Sklar MB, Xu Z, Farrell AM, Bogorad MI, Chu C, Walczak P, Cheng L, **Mahairaki V**, Whartenby KA, Calabresi PA, Searson PC. Human iPSC-derived blood-brain barrier microvessels: validation of barrier function and endothelial cell behavior. *Biomaterials.* 2018 Oct 25;190-191:24-37.
18. Wu M, Liu S, Gao Y, Bai H, **Machairaki V**, Li G, Chen T, Cheng L. Conditional gene knockout and reconstitution in human iPSCs with an inducible Cas9 system. *Stem Cell Res.* 2018 May;29:6-14. doi: 10.1016/j.scr.2018.03.003.

19. Cai L*, Bai H* **Machairaki V***, Gao Y, He C, Wen Y, Jin Y-C, Wang Y, Yeand Z and Cheng L. A universal approach to correct various HBB gene mutations in human stem cells for gene therapy of beta-thalassemia parents. *Stem Cells Transl Med.* 2018 Jan;7(1):87-97 (***equal contribution**).
20. Eitan E, Hutchison ER, Marosi K, Comotto J, Mustapic M, Nigam SM, Suire C, Maharana C, Liu D, **Machairaki V**, Witwer KW, Kapogiannis D and Mattson MP. Extracellular Vesicle-Associated A β Mediates Trans-Neuronal Bioenergetic and Ca²⁺-Handling Deficits in Alzheimer's Disease Models. *Nature Partner Journals Aging Mech Dis.* 2016;2. pii: 16019.
21. Zhao Z, Muth DC, Machairaki V, **Cheng L**, Witwer KW. Isolation and Characterization of Extracellular Vesicles in Stem cell-related Studies. *Stem Cell Technologies in Neuroscience 2017* (a chapter book of methodology).
22. Xu L, Ryu J, Hiel H, Menon A, Aggarwal A, Rha E, **Machairaki V**, Cummings BJ and Koliatsos VE: Transplantation of human oligodendrocyte progenitor cells in an animal model of diffuse traumatic axonal injury survival and differentiation. *Stem Cell Research & Therapy*, 2015 May 14;6:93.
23. **Machairaki V**, Ryu J., Peters A, Park TS, Chang Q, Park T.S, Burridge PW, Conover CT, Asnaghi L, Martin L.J, Zambidis ET and Koliatsos VE: Induced Pluripotent Stem Cells from Familial Alzheimer's Disease Patients Differentiate into Mature Neurons with Amyloidogenic Properties. *Stem Cells Dev.* 2014 Dec 15;23(24):2996-3010.
24. Rossi S, Machairaki V, Koliatsos VE: Remodeling of piriform cortex after lesion in adult rodents, *Neuroreport.* 2014 Sep 10;25(13):1006-12
25. Xu, L, Machairaki V and Koliatsos VE: Host induction by transplanted neural stem cells in the spinal cord: further evidence for an adult spinal cord neurogenic niche. *Regen. Med.* 7(6):785-97, 2012.
26. Burridge P., Thompson S., Millrod MA., Weinberg W., Yuan X., Peters A., Machairaki V., Koliatsos VE. Tung L., and Zambidis ET. A universal system for highly efficient cardiac differentiation of human induced pluripotent stem cells that eliminates interline variability. *PLoS ONE* 2011 April 8; 6(4): e18293.
27. Nasonkin I, Machairaki V, Xu L, Hatfield G, Cummings B, Eberhart C, Ryugo DK Maric D, Bar E and Koliatsos VE: Long-Term stable differentiation of human embryonic stem cell-derived neural precursors grafted into the adult mammalian neostriatum, *Stem Cells.* 2009 Oct;27(10):2414-26.
28. Bar, E.E., Lin, A., **Machairaki, V.**, Matsui, W., and Eberhart C.G. Hypoxia increases the expression of stem-cell markers and promotes clonogenicity in glioblastoma neurospheres. *Am J Pathol.* 2010 Sep;177(3):1491-502.
29. **Machairaki, V.**, Lim, S.H., Christopherson, G.T, Xu, L., Nasonkin, I., Yu, C., Mao, H.Q., and Koliatsos, V.E. Nanofiber Matrices Promote the Neuronal Differentiation of Human Embryonic Stem Cell-Derived Neural Precursors In Vitro. *Tissue Eng Part A.* 2010 Dec 18. PMID: PMC3043983
30. **Machairaki V**, Xu L, Farah MH, Hatfield G, Kizzana E, Marban E and Koliatsos VE. Targeted knock down of neuronal nitric oxide synthase expression in basal forebrain with RNA interference, *J Neurosci Methods* 2009 May 15;179(2):292-7. Epub 2009 Feb 28 PMID: PMC2701643 [Available on 2010/05/15].
31. Warr, E., Aguilar, R., Dong, Y., **Machairaki, V.** and Dimopoulos, G. Spatial and sex-specific dissection of the *Anopheles gambiae* midgut transcriptome. *BMC Genomics.* 2007 Jan 29;8(1):37.
32. Moita, L.F., Blandin, S., Moita, C.F., **Machairaki, V.**, Louis, C., Levashina, E.A., Kafatos, F.C. Integrins of *Anopheles gambiae* and a putative role of a new β integrin, BINT2, in phagocytosis of E.coli. *Insect Biochem Mol Biol.* 2006 Apr;36(4):282-90.
33. **Machairaki V**, Lycett G, Siden-Kiamos I, Sinden RE, Louis C. Close association of invading *Plasmodium berghei* and beta integrin in the *Anopheles gambiae* midgut. *Arch Insect Biochem Physiol.* 2005 Sep;60(1):13-9.
34. Aguilar R, Jedlicka AE, Mintz M, **Machairaki V**, Scott AL, Dimopoulos G. Global gene expression analysis of *Anopheles gambiae* responses to microbial challenge. *Insect Biochem Mol Biol.* 2005 Jul;35(7):709-19.
35. Arrighi RB, Lycett G, **Machairaki V**, Siden-Kiamos I, Louis C Laminin and the malaria parasite's journey through the mosquito midgut. *J Exp Biol.* 2005 Jul;208(Pt 13):2497-502.
36. **Machairaki V**, Voyatzi T, Siden-Kiamos I, Louis C. The *Anopheles gambiae* gamma1 laminin directly binds the *Plasmodium berghei* circumsporozoite- and TRAP-related protein (CTRP). *Mol Biochem Parasitol.* 2005 Mar;140(1):119-21.
37. Dessens JT, Siden-Kiamos I, Mendoza J, **Machairaki V**, Khater E, Vlachou D, Xu XJ, Kafatos FC, Louis C, Dimopoulos G, Sinden RE. SOAP, a novel malaria ookinete protein involved in mosquito midgut invasion and oocyst development. *Mol Microbiol.* 2003 Jul;49(2):319-29.
38. **Machairaki V**, Lycett G, Blass C, Louis C. Beta-integrin of *Anopheles gambiae*: mRNA cloning and analysis of structure and expression. *Insect Mol Biol.* 2001 Jun;10(3):217-23.

I. National and International Conferences

Machairaki V : Keynote speaker Genedis 2020

- **Machairaki V** : "Scientific Wisdom Webinar on Dementia & Dementia Care", September 24, 2021 (Invited speaker).
- **Machairaki V** : "2nd International Conference on Neurology & Neuro Disorders", Hilton Garden Inn Zurich Limmattal, Zurich, Switzerland, November 15 – 17, 2021 (Invited speaker).
- **Machairaki V** : "International Conference on Cell and Experimental Biology (CEB-2020)", December 9-11, 2020; Boston, USA (Invited speaker).
- **Machairaki V** : Global Virtual Summit on Psychiatry and Mental Health; virtual; September 24-25, 2021 (Invited speaker).
- **Machairaki V** : Human pluripotent stem cells as invitro models for Alzheimer's disease. 2nd Annual Global Conference on Neuroscience and Neurology, Montreal, August 2020 (Invited speaker).
- Ara T, Huang Y , **Machairaki V**, Troncoso JC, Olga Pletniková, Witwer KW. **Separation of microglial EVs from human brain-derived EVs**. International Society for Extracellular Vesicles, May 2020, Philadelphia.
- **Morales Pantoja IE**, Smith MD, Rajbhandari L, Cheng L., Gao Y, **Machairaki V**, Venkatesan A, Calabresi PA, Fitzgerald KC, Whartenby KA. iPSC-derived Oligodendrocytes from people with MS reveal chronic exposure to IFN γ derails differentiation and redirects lineage, ACTRIMS Young Scientist Summit in Clinical Neuroimmunology February 2020, West Palm Beach, FL .
- **Morales Pantoja IE**, Smith MD, Rajbhandari L, Cheng L., Gao Y, **Machairaki V**, Venkatesan A, Calabresi PA, Fitzgerald KC, Whartenby KA. iPSC-derived Oligodendrocytes from people with MS reveal chronic exposure to IFN γ derails differentiation and redirects lineage, ACTRIMS Young Scientist Summit in Clinical Neuroimmunology January 2020, Austin TX.
- **Morales Pantoja IE, Machairaki V**, Chamling X, Zack DJ, Calabresi PA, Whartenby KA. Induced pluripotent stem cell-derived retinal ganglion cell model system to study neurodegeneration in progressive multiple sclerosis, TEDCO 2017 Baltimore, MD.
- **Machairaki V** : Human pluripotent stem cells as invitro models for neurodegenerative diseases. GeNeDis 2018 , Toronto , Canada, October 2018 (Invited speaker).
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