CURRICULUM VITAE

NAME: ARMINE DARBINYAN, M.D.

OFFICE ADDRESS: Assistant Professor
Neuropathology/Cytopathology
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ACADEMIC QUALIFICATION AT DEGREE LEVEL:

M.D. Yerevan State Medical University Mkhitar Heratsi, Armenia, 1985

Career/Academic Appointments:

09/1985-03/1992	**Internal Medicine/Pulmonology Resident** Yerevan State Medical University Mkhitar Heratsi Republican Hospital Center of Pulmonology Yerevan, Armenia
04/1992-08/1999	**Physician,** Department of Internal Medicine Yerevan State Medical University, Republican Hospital Center of Pulmonology Yerevan, Armenia
09/1999-05/2004	**Assistant Scientist**, Temple University, Center for Neurovirology/Cancer Biology, Philadelphia, PA
05/2004-08/2007	**Associate Scientist,** Department of Neuroscience Temple University School of Medicine, Philadelphia, PA
09/2008-09/2009	**Adjunct Assistant Professor**, Department of Biology Temple University School of Medicine, Philadelphia, PA
09/2009-04/2010	**Associate Scientist**, Department of Neuroscience Temple University School of Medicine, Philadelphia, PA
04/2010-06/2012	**Assistant Professor**, Department of Neuroscience Temple University School of Medicine, Philadelphia, PA
07/2012-06/2014	**Resident,** Anatomic Pathology/Neuropathology Department of Pathology, Icahn School of Medicine at Mount Sinai, New York, NY 10029
07/2014-06/2016	**The Joseph Schein Endowed Fellow in Neuropathology, Experimental/Molecular Pathology** Department of Pathology, Icahn School of Medicine at Mount Sinai, New York, NY 10029
07/2016-07/2017	**Cytopathology Fellow**, Department of Pathology and Laboratory Medicine, College of Medicine, Drexel University, Philadelphia, PA, 19102
11/2017 – 08/2017	**Instructor, Pathology** (Neuropathology/Cytopathology/) Department of Pathology, Yale University School of Medicine

09/2019 – Present **Assistant Professor, Pathology** (Neuropathology/Cytopathology)
Department of Pathology, Yale University School of Medicine

Professional Honors & Recognition

School of Medicine

2014: The Joseph Schein, M.D., Endowed Fellowship in Experimental/Molecular Pathology, Neuropathology Department of Pathology Mount Sinai's Lillian and Henry M. Stratton-Hans Popper, New York, NY

1985: Diploma of Excellence, Doctor of Medicine, Yerevan State Medical University, Armenia

International

2004: Hilary Koprowski 2004 ISNV Pioneer in Neurovirology Lectureship Award for Excellence, 6th International Symposium on Neurovirology, Alghero, Italy

Other

1978: Diploma of Excellence, Piano, Tigranian Musical College, Armenia

Academic/Teaching Activities

- Lecture series for residents and fellows at Yale in Neuropathology and Cytopathology
- CME accredited interdisciplinary Neurosurgery/Neuropathology/Neurooncology/Neuroradiology Tumor Boards

Invited Speaking Engagements, Presentations, Symposia & Workshops

International/National

2015: Spinocerebellar ataxia type 3 (SCA3)/ Machado-Joseph disease (MJD) with numerous polyglucosan bodies in HIV+ African-American male with history of head trauma. **Annual Meeting of the American Association of Neuropathologists.** Denver, CO.

2015: Spatio-temporal expression of DING during human fetal brain development. **1st International DING Symposium**: DING Protein Research and its Role of DING in Human Health. September 17-18, 2015, Philadelphia, PA

2012: Polyomavirus JC infection of human oligodendrocyte progenitor cells dysregulates production of chemokines and alters differentiation of oligodendrocytes. **11th International Symposium on NeuroVirology** held jointly with Conference on HIV in the Nervous System. New York, New York.

2010: Role of JCV induced disbalance of chemokines in neuron-glia interaction. **10th International Symposium on NeuroVirology** and 2010 Conference on HIV and the Nervous System. Milan, Italy.

2004: Role of JC virus Agnoprotein in DNA repair. **6th International Symposium on NeuroVirology**; Alghero, Italy.

Regional

2015: BK virus encephalopathy and sclerosing cerebral vasculopathy in a patient with X-linked hypohidrotic ectodermal dysplasia and immune deficiency. Implications for the NF-kappa-B pathway dysregulation. **Neuroplex meeting**, December 16, 2015. Memorial Sloan Kettering Cancer Center. New York, NY

2015: Malignant transformation of a recurrent craniopharyngioma, adamantinomatous type (invasive squamous cell carcinoma). Mutations harbored by craniopharyngiomas of adamantinomatous and papillary types. Memorial Sloan Kettering Cancer Center. **Neuroplex meeting**, January 14, 2015. New York, NY.

2011: Human Neurotropic JC Virus and Demyelinating Disease, Progressive Multifocal Leukoencephalopathy Workshop. Temple University School of Medicine. Philadelphia, PA, 2011.

Pathology-Neurosurgery-Neuroradiology Grand rounds

College of Medicine, Drexel University, Philadelphia, PA.

02-07-2017: Diffuse Gliomas: Summary of the Major Changes in the 2016 WHO Classification of Tumors of the Central Nervous System.

Icahn School of Medicine at Mount Sinai, New York, NY.

07-15-2015: Virally induced lesions in CNS. Progressive multifocal leukoencephalopathy (JCV). BK virus encephalopathy and sclerosing cerebral vasculopathy in a patient with X-linked NEMO deficiency.

03-18-2015: Tuberous sclerosis complex and subependymal giant-cell astrocytomas. (SEGAs). Diffuse large B-cell lymphoma of the CNS.

02-18-2015: Pilocytic astrocytoma, differential diagnosis. Malformations of cortical development: polymicrogyria.

01-21-2015: Ganglioma: differential diagnosis. Ependymoma: molecular genetics. Delineation of two clinically and molecularly distinct subgroups of posterior fossa ependymoma

12-17-2014: Tumors derived from the choroid plexus epithelium: papilloma and choroid plexus carcinoma. Craniopharyngioma, adamantinomatous and papillary types. Malignant transformation of a recurrent craniopharyngioma.

10-15-2014: Histologic variants and grading of astrocytomas.

08-20-2014: Transformation of traditional histological diagnoses of gliomas. Genomic alterations and transcriptional subtypes of glioblastoma.

<u>Gene Bank submissions</u>

1. **Homo sapiens isolate DINGpa5 DING5 gene, partial cds.** 480 bp linear DNA. Accession: HM572271.1 GI: 335335512
2. **Homo sapiens isolate DINGpa4 DING4 gene, partial sequence.** 376 bp linear DNA. Accession: HM572270. G**I:** 335335511

3. **Homo sapiens isolate DINGhNT3 DING3 gene, partial cds.** 480 bp linear DNA. Accession: HM572269.1 GI: 335335509
4. **Homo sapiens isolate DINGhu2 DING2 gene, partial sequence**.105 bp linear DNA. Accession: HM572268.1 GI: 335335508
5. **Homo sapiens isolate DINGhu1 DING1-like mRNA, partial sequence**. 376 bp linear mRNA. Accession: HM572267.1 GI: 335335507
6. **Homo sapiens DING protein p38 gene, complete cds.** 1,095 bp linear DNA. Accession: HM171537.1 GI: 298105658
7. **Hypericum perforatum DING protein (p38SJ) mRNA, complete cds** 1,095 bp linear mRNA. Accession: AY866430.2 GI: 295687389

Professional Societies Memberships:
Full Membership with the Children's Oncology Group (COG), Pathology Discipline, Representative from Yale

Member, College of American Pathologists
Member, American Association of Neuropathologists
Member, American Society of Cytopathology

Public Service:
Temple University School of Medicine (TUSM), Representative Senator 2011-2014
Temple University, Senate Committee on the Status of Women, member 2012- 2014
Temple University, Mentor for graduate students (PhD and MS) and junior scientists 2006 -2012

PUBLICATIONS:

Original Peer-reviewed Articles

1. Safak M, Barrucco R, **Darbinyan A**, Okada Y, Nagashima K, Khalili K.. Interaction of JC virus Agnoprotein with T antigen modulates transcription and replication of the viral genome in glial cells: J Virol.. 2001 Feb; 75(3): 1476-1486.
2. **Darbinyan A**, Darbinian N, Safak M, Radhakrishnan S, Giordano A, Khalili K.. Evidence for dysregulation of cell cycle by human polyomavirus, JCV, late auxiliary protein. Oncogene: 2002 Aug; 21(36): 5574-5581.
3. **Darbinyan A**, Siddiqui KM, Slonina D, Darbinian N, Amini S, White MK, Khalili K.. Role of JC virus Agnoprotein in DNA repair: J Virol.. 2004 Aug; 78(16): 8593-8600
4. Trojanek J, Croul S, Ho T, Wang JY, **Darbinyan A**, Nowicki M, Del Valle L, Skorski T, Khalili K, Reiss K.. T-antigen of the human polyomavirus JC attenuates faithful DNA repair by forcing nuclear interaction between IRS-1 and Rad51. J Cell Physiol.: 2006 Jan; 206(1): 35-46.
5. Darbinian-Sarkissian N, **Darbinyan A**, Otte J, Radhakrishnan S, Sawaya BE, Arzumanyan A, Chipitsyna G, Popov Y, Rappaport J, Amini S, Khalili K. p27(SJ), a novel protein in St John's Wort, that suppresses expression of HIV-1 genome.: Gene Ther.. 2006 Feb; 13(4): 288-295.
6. Kaniowska D, Kaminski R, Amini S, Radhakrishnan S, Rappaport J, Johnson E, Khalili K, Del Valle L, **Darbinyan A**: Cross-Interaction between JC Virus Agnoprotein and Human Immunodeficiency Virus Type 1 (HIV-1) Tat Modulates Transcription of the HIV-1 Long Terminal Repeat in Glial Cells. J Virol. 2006 Sep; 80(18): 9288-9299.

7. **Darbinyan A**, White MK, Akan S, Radhakrishnan S, Del Valle L, Amini S, Khalili K. . Alterations of DNA damage repair pathways resulting from JCV infection: Virology. 2007 Jul; 364(1): 73-86.
8. Merabova N, Kaniowska D, Kaminski R, Deshmane SL, White MK, Amini S, **Darbinyan A**, Khalili K. JC virus Agnoprotein inhibits in vitro differentiation of oligodendrocytes and promotes apoptosis.: J Virol.. 2008 Feb; 82(3): 1558-1569.
9. Kaminski R, Darbinian N, Sawaya BE, Slonina D, Amini S, Johnson EM, Rappaport J, Khalili K, **Darbinyan A.** Pura as a cellular co-factor of Rev/RRE-mediated expression of HIV-1 intron-containing mRNA.. J Cell Biochem.: 2008 Mar; 103(4): 1231-1245.
10. Darbinian N, **Darbinyan A**, Czernik M, Peruzzi F, Khalili K, Reiss K, Gordon J, Amini S.. HIV-1 Tat inhibits NGF-Induced Egr-1 transcriptional activity and consequent p35 expression in neural cells. J Cell Physiol.: 2008 Jul; 216(1): 128-134.
11. Kaminski R, **Darbinyan A**, Merabova N, Deshmane SL, White MK, Khalili K. Protective role of Puralpha to cisplatin.. Cancer Biol Ther.: 2008 Dec; 7(12): 1926-1935.
12. Darbinyan N., Czernik M., **Darbinyan A**., Elias M., Chabriere E., Bonasu S, Khalili K., Amini S. Evidence for phosphatase activity of p27SJ and its impact on the cell cycle: J Cell Biochem. 2009 Jun; 107(3): 400-407.
13. Rom I, **Darbinyan A**, White MK, Rappaport J, Sawaya B, Amini S, Khalili K. Activation of HIV-1 LTR by Rad51 in microglial cells. Cell Cycle: 2010 Sep;9(18):3715-22.
14. Kaminski R, Cheeseboro L, Amini S, Johnson EM, White MK, Khalili K, **Darbinyan A**: Role of Pura in the cellular response to ultraviolet-C radiation. Cell Cycle. 2010 Oct 15;9(20):4164-73..
15. Merabova N, Kaminski R, Krynska B, Amini S, Khalili K, **Darbinyan A**: JCV agnoprotein-induced reduction in CXCL5/LIX secretion by oligodendrocytes is associated with activation of apoptotic signaling in neurons. J Cell Physiol. 2012 Aug;227(8):3119-27.
16. **Darbinyan A,** Kaminski R, White MK, Darbinian-Sarkissian N, Khalili K. Polyomavirus JC infection inhibits differentiation of oligodendrocyte progenitor cells: J Neurosci Res. 2013 Jan;91(1):116-27.
17. Wang JY, **Darbinyan** A, White MK, Darbinian N, Reiss K, Amini S: Involvement of IRS-1 Interaction With ADAM10 in the Regulation of Neurite Extension. J Cell Physiol. 2014 Aug; 229(8):1039-46.
18. Pozniak P, **Darbinyan A**, Khalili K: TNF-Alpha/TNFR2 Regulatory Axis Stimulates EphB2-Mediated Neuroregeneration Via Activation of NF-KappaB. J Cell Physiol. 2016 Jun;231(6):1237-48.
19. Padmini M, Partovi E, Lo, Y-C, **Darbinyan A,** Pinto M, Kowalski D, Raad R Abi, Adeniran A, Wilson P, Harigopal M. Discordance in Hormone Receptor Status of Primary Versus Metastatic Breast Carcinoma. Journal of the American Society of Cytopathology. Published September 1, 2018. Volume 7, Issue 5. Pages S4-S5.

Chapters, Books, and Reviews

20. White MK, Gordon J, Reiss K, Del Valle L, Croul S, Giordano A, **Darbinyan A**, Khalili K.. Human polyomaviruses and brain tumors: Brain Res Brain Res Rev. 2005 Dec; 50(1): 69-85.
21. **Darbinyan A**, Kaminski R, White MK, Darbinyan N, Khalili K: Isolation and propagation of primary human and rodent embryonic neural progenitor cells and cortical neurons. **Chapter 5 in Neuronal Cell Culture. Methods Mol Biol. Springer Protocols. 2013;1078:45-54**. PMID:23975820

22. **Darbinyan A**, Pozniak P, Darbinyan N, White MK, Khalili K: Compartmentalized neuronal cultures. **Chapter 13 in Neuronal Cell Culture. Methods Mol Biol. Springer Protocols. 2013;1078:147-52.** PMID:23975828
23. Tsankova N, **Darbinyan A**, Fowkes ME: Histological and Molecular Diagnosis of Glioblastoma multiforme. 2015. **Chapter 3,** pp. 31-44, in **Glioblastoma Multiforme: Symptoms, Diagnosis, Therapeutic Management and Outcome** (ed. Germano IM). NovaSciencePublishers. ISBN: 978-1-63483-273

Case Reports

24. Sherman JL, **Darbinyan A,** Magid MS, Ong P, Weissman B, Benkov K, Aaron M. Lipskar AM. Pediatric colonic inflammatory myofibroblastic tumor presenting as colo-colonic intussusception: A case report and review of the literature. J Ped Surg Case Reports 3 (2015) 392 – 396.
25. Pain M, **Darbinyan A**, Fowkes M, Shrivastava R. Multiple Meningiomas in a Patient with Cowden Syndrome. J Neurol Surg Rep. 2016 Jul;77(3):e128-33.
26. **Darbinyan A**, Major EO, Morgello S, Holland S, Ryschkewitsch C, Monaco MC, Naidich TP, Bederson **J**, Ye F, Malaczynska, J Gordon R, Cunningham-Rundles C, Fowkes M, Tsankova NM: BK Virus Encephalopathy and Sclerosing Vasculopathy in a Patient with Hypohidrotic Ectodermal Dysplasia and Immunodeficiency**.** Acta Neuropathol Commun. 2016 Jul 13;4(1):73.
27. Fomchenko EI, Erson-Omay EZ, Kundishora AJ, Hong CS, Daniel AA, Allocco A, Duy PQ, **Darbinyan A,** Marks AM, DiLuna ML, Kahle KT, Huttner A. Genomic alterations underlying spinal metastases in pediatric H3K27M-mutant pineal parenchymal tumor of intermediate differentiation: case report. J Neurosurg Pediatr. 2019 Oct 25:1-10. doi: 10.3171/2019.8. PEDS18664.

Accepted for publication (in press):

28. **Darbinyan A**, Kaminski R, White MK, Darbinyan N: Isolation and propagation of primary human and rodent embryonic neural progenitor cells and cortical neurons. Chapter # in Neuronal Cell Culture. Methods Mol Biol. Springer Protocols. 2nd edition, 2019.
29. **Darbinyan A,** Pozniak P, Darbinyan N, White MK: Compartmentalized neuronal cultures. Chapter # in Neuronal Cell Culture. Methods Mol Biol. Springer Protocols. 2nd edition, 2019.

Submitted for publication:

30. Nune Darbinian, **Armine Darbinyan**, Nana Merabova, Ahsun Bajwa, Gabriel Tatevosian, Diana Martirosyan, Michael E. Selzer, Laura Goetzl. Ethanol-Mediated Alterations in Oligodendrocyte Differentiation in Developing Brain. Neurobiology of Disease, 2019
31. Nune Darbinian, **Armine Darbinyan**, Michael E. Selzer, Shohreh Amini. Cloning of Novel Human DING genes and cDNA library. JoVE, 2019
32. Nune Darbinian, **Armine Darbinyan**, Kamel Khalili, Shohreh Amini. Fetal Brain Injury Models of Fetal Alcohol Syndrome: Examination of Neuronal Morphologic Condition Using Sholl Assay. Methods in Molecular Biology – Neuronal Cell Culture. CHAPTER 18, 2019
33. **Armine Darbinyan**, Raffaella Morotti, Guoping Cai, Manju Lata Prasad, Emily Christison Lagay, Catherine Dinauer, Adebowale J. Adeniran. CYTOMORPHOLOGIC FEATURES OF THYROID

DISEASE IN PATIENTS WITH DICER1 MUTATIONS: A REPORT OF SEVEN PATIENTS Cancer Cytopathology, 05/03/2020 (under review)

Platform/poster presentations (most recent)

1. ***DICER1 Mutation in Follicular Neoplasm of the Thyroid***. **Darbinyan A,** Morotti R, Prasad ML, Christison-LagayE, DinauerC, Cai G, Adeniran A. Abstract number #2728, to the United States & Canadian Academy of Pathology's 108th Annual Meeting in National Harbor, Maryland, March 16-21, 2019.
2. Darbinian N, **Darbinyan A**, Merabova N, Tatevosian G, Shohreh A, Morrison M, Selzer M. Effects of in utero EtOH exposure on biomarkers of depression and anxiety: pDING and the serotonin-dopamine pathway. University of Pennsylvania Mahoney Institute for Neurosciences 35th Annual Symposium "Year of Neurodegenerative Research", April 3, 2019. Philadelphia PA.
3. Nune Darbinian, Nana Merabova, Praveen Samuel, Amer Samdani, **Armine Darbinyan**, Michael Selzer. Lipid Metabolism Biomarkers in Cerebral Palsy and Scoliosis. Fifth Annual Shriners-Temple Symposium on Neural Repair - June 14th. Philadelphia PA
4. Darbinian N, **Darbinyan A**, Merabova N, Bajwa A, Tatevosian G, Martirosyan D, Selzer ME, Goetzl L. Ethanol-Mediated Alterations in Oligodendrocyte Differentiation in Developing Brain. 4th Annual Shriners/Temple Symposium on Neural Repair, June 8, 2018 Philadelphia PA.
5. Darbinian N, Merabova N, Vasiiou V, **Darbinyan A**, Samuel AP, Selzer ME. Noninvasive Lipid Metabolism Biomarkers in Human Congenital Demyelinating Disorders: Developing of a Human Biobank. 4th Annual Shriners/Temple Symposium on Neural Repair, June 8, 2018 Philadelphia PA.
6. Darbinian N, **A. Darbinyan**, N. Merabova G. Tatevosian, S. Amini, M. F. Morrison, L. Goetzl, M. E. Selzer. Effects of *in utero* EtOH exposure on biomarkers of depression and anxiety: pDING and the serotonin-dopamine pathway. The Society of Neuroscience (SfN) annual meeting 2019, October 19-23, Chicago, Il, USA
7. M. Selzer, E. Sparks, **A. Darbinyan**, N. Merabova, G. Tatevosian, M. Morrison, L. Goetzl, N. Darbinian. IN UTERO ALCOHOL EXPOSURE, MATERNAL DEPRESSION, AND MATERNAL OBESITY INHIBIT OLIGODENDROCYTE DIFFERENTIATION IN THE DEVELOPING BRAIN. RSA/ISBRA-2020. 43rd Annual RSA (Research Society on Alcoholism) Scientific Meeting / ISBRA Congress, June 20-24, 2020, New Orleans, Luisiana
8. N. Darbinian, **A. Darbinyan,** N. Merabova, E. Sparks, G. Tatevosian, S. Amini, L. Goetzl, M. Selzer. PRENATAL ALCOHOL EXPOSURE INHIBITS TRANSIENT EXPRESSION OF SYNAPTIC AND AUTOPHAGY PROTEINS IN DEVELOPING BRAIN. RSA/ISBRA-2020. 43rd Annual RSA Scientific Meeting / ISBRA Congress, June 20-24, 2020, New Orleans, Luisiana
9. N. Darbinian, **A. Darbinyan,** N. Merabova, S. Amini, L. Goetzl, M. Selzer. IN UTERO ETHANOL EXPOSURE INDUCES MITOCHONDRIAL DNA DAMAGE AND INHIBITS mtDNA REPAIR IN DEVELOPING BRAIN. RSA/ISBRA-2020. 43rd Annual RSA Scientific Meeting / ISBRA Congress, June 20-24, 2020, New Orleans, Luisiana
10. Sandra Abi Fadel, Zeynep Erson Omay, **Armine Darbinyan**, Asher Marks, Richard Bronen, Robert Fulbright, Amit Mahajan, Mariam Aboian. Imaging characteristics of pilomyxoid astrocytomas with quantitative description of diffusion characteristics and genetic signature. ASPNR (American society of Pediatric Neuroradiology), Miami, 01/2020, FL

11. Nalin Leelatian, Deepika Kumar, **Armine Darbinyan.** Cryptococcal myositis mimicking deep venous thrombosis. American Association of Neuropathologists's (AANP) 96th Annual Meeting, 06/11-14/2020

Grant History

Past Grants:

Agency: Icahn School of Medicine at Mount Siinai, New York, NY 10029
ID: The Joseph Schein, M.D., Endowed Fellowship in Neuropathology/ Experimental/Molecular Pathology
Title: Training in Neuropathology/Experimental/Molecular Pathology
Program Director: Mary Fowkes, M.D., Ph.D.
Percent effort: 100%
Total costs for project period:
Project period: 07/01/2014-06/30/2016

Agency: NIH/NINDS
ID #: 1P01 NS43980-06
Title: "Signaling pathways modulating HIV-1 induced injury in CNS"
Program Director: Shohreh Amini, Ph.D
Project 2: "IGF-1 signaling pathway in HIV-1 CNS disorders"
Co-Investigator: Armine Darbinyan.
The major goals of Project 2 are to identify the role of IGF-1 signaling pathway in HIV-1 associated neuronal injury in the brain
Percent effort: 70%
Total costs for project period: $1,147,331
Project period: 09/01/2002-06/30/2014

Agency: NIH/NINDS
ID #: 1RO1MH093271-01
Title: "Regulation of HIV-1 by Rad51 in CNS cells"
Program Director: Kamel Khalili, Ph.D
The major goal of this project is to investigate function of rad51 in HIV-1 infected CNS cells.
Percent effort: 25%
Total costs for project period: $382,500
Project period: 12/01/2010 – 11/30/2015

Agency: OSI Assistance Foundation (OSIAF), Yerevan, Armenia
Title: Lung diseases, including TB, among residents of nursing homes in Yerevan
Study Director: Armine Darbinyan
Percent effort: 25%
Total costs for project period: $10,000
Project period: 01/1999-07/1999

Research interests: Cancer biology (molecular pathways involved in the development of pediatric and adult brain tumors, DNA repair (including MMR) in the development of brain tumor and tumor resistance to treatment, role of DICER1 in cancerogenesis; virology and neurovirology.