Kurt Farrell
Kurt.farrell@mssm.edu

APPOINTMENTS/EMPLOYMENT

1) Dept. of Pathology (Neuropathology)
Icahn School of Medicine
Assistant Professor
April 2022 - Current

2) Dept. of Pathology (Neuropathology)
Icahn School of Medicine
Instructor
Dec 2020 – March 2022

3) Dept of Chemistry
Cuyahoga Community College
Adjunct Faculty
Jan 2012 – Jan 2016

GAPS IN EMPLOYMENT

Not applicable

EDUCATION

Undergraduate
The Ohio State University
Columbus, Ohio
Bachelor of Science, duel degree, chemistry and biology, June 2009

Graduate
Cleveland State University
Cleveland, Ohio
Master of Science, Biomedical Engineering, May 2011
Mentors Drs. Joanne Belovich and Ron Midura

Graduate
Cleveland Clinic, Cleveland State University (joint program)
Cleveland, Ohio
Doctor of Philosophy, Applied Biomedical Engineering, May 2016
Mentor Dr. Chandra Kothapalli

Postdoctoral Training
Icahn School of Medicine at Mount Sinai
New York, New York
Research fellowship, genetics, neuropathology and machine learning.
Mentors Drs. John Crary and Alison Goate

CERTIFICATION

Not applicable

LICENSURE

Not applicable

HONORS/AWARDS

1) Neurodegenerative Scholar
American Association of Neuropathologists
April 2020

2) Graduate student leadership award
Cleveland State University
May 2015

3) First place, research day poster award
Cleveland State University
May 2015

4) Dissertation research award
Cleveland State University
Jan 2014

5) Graduate student travel award
Tissue Engineering and Regenerative Medicine Society
Dec 2014

6) Cellular and molecular medicine specialization
Cleveland Clinic
Sept 2012

PATENTS
Not applicable

OTHER PROFESSIONAL ROLES*
1) Panelist, Chan Zuckerberg Initiative (CZI) Neurodegeneration Challenge Network (NDCN) AI/ML in Neurodegeneration Workshop April 2022
2) Co-Chair, National Alzheimer's Coordinating Center Digital pathology webinar series, May 2024-present.

RESEARCH PROFILE
I have been involved in projects which seek to identify molecular and genetic mechanisms that underlie tauopathy, and how these features influence clinical phenotypes. Specifically, my research has focused on the regulation of the expression of toxic forms of the microtubule-associated protein tau. I have deployed several tools and techniques to understand the mechanisms driving tauopathy including deep learning and machine learning on digitized whole slide post-mortem brain tissue, genome wide association studies, bulk and single cell nuclei RNA sequencing, and functional validation studies in human and non-human model systems. As the first author I was the first to run a genome wide association study in a group of individuals with primary age-related tauopathy and demonstrated that the JADE1 protein plays a protective role in tauopathy. Additionally, I was the first author on the largest genome wide association study of progressive supranuclear palsy, a multi-intuitional collaboration that for the first time identified a neuroinflammatory signal (C4A) and oligodendrocytic involvement in the disorder. Lastly, I was part of a team of scientists which published data showing one of the earliest frameworks for building and evaluating deep learning algorithms using large-scale image data in neuropathology.

The focus of my research program at Mount Sinai is to understand modifiers of the tau protein in elderly individuals across both normal and pathologic aging using computational approaches including machine learning and computer vision. Specifically, I am interested in translating clinical, genetic, and transcriptomic data to understand the molecular mechanisms driving neurodegenerative tauopathies. I have formal training in bioengineering and experimental neuropathology which allows me to translate and validate the results of computational approaches in human tissue and cellular models. I strive to foster for cross-collaborations between different fields of biomedical research.

CLINICAL PROFILE
Not applicable

IMPACT
I have developed a national reputation for my contributions to the understand of the genetic and clinical profile of primary age-related tauopathy and progressive supranuclear palsy. Additionally, I am a pioneer in leveraging

machine learning in digital neuropathology to characterize and better understand neurodegenerative disorders. My work has been written up in alzforum.org on multiple times as well as other news outlets and I have been invited to speak at institutions across the world as a result. I was selected as one of the few PhD scientists to be an American Association of Neuropathologists scholar. Lastly, I have invited to speak at events hosted by the Rainwater Charitable foundation (Tau Consortium), the Chan Zuckerberg Initiative, and CurePSP.

GRANTS, CONTRACTS, FOUNDATION SUPPORT

PAST GRANTS

Name and organization	Role in Project	Dates	Direct Costs	Supplemental Info
Cleveland State University, Cellular and molecular medicine fellowship	Selected Recipient of funding	2012-2015	18,000	N/A
Cleveland State University, Cleveland State dissertation research award	Selected Recipient of funding	2014-2015	5,000	N/A
National Institute of Health, Post-doctoral fellowship in the mechanisms of age-related tauopathy (F32 AG056098)	PI	2017-2020	62,500 per year (3 years)	N/A
National Institute of Health, Loan Repayment Grant	PI	2019-2021	14,201	N/A
National Institute of Health, Mount Sinai Alzheimer's disease research center educational fellowship (P30 AG066514)	Selected Recipient of funding	2020-2022	61,500 per year, (2 years)	N/A

CURRENT GRANTS

National Institute of Health, Novel artificial intelligence-based approaches to understand the pathological and genetic drivers of primary tauopathies (K01 AG070326-01A1)	PI	2022-2026	116,750 per year (4 years)	N/A
CurePSP pathway grant (685-2023-06-Pathway)	PI	2023-2025	100,000	N/A
National Institute of Health, Loan Repayment Grant	PI	2024-2026	14,441	N/A
Rainwater Charitable foundation (Tau Consortium)	PI	2024-2026	200,000	N/A

PENDING GRANTS

Name and organization	Role in Project	Dates	Direct Costs	Supplemental Info
National Institute of Health, Understanding the genetic and transcriptomic risk factors of progressive supranuclear palsy (R01)	PI	2025-2029	450,000 per year (4 years)	Fall submission 2024

CLINICAL TRIALS PARTICIPATION

Not applicable

TRAINEES

Name	Level of Trainee	Role in Training	Training Venue	Trainees' Current Status
Megan Iida	Research assistant	Mentor (2016-2019)	Laboratory, molecular biology	Medical tudent, University of Michigan
Alicia Casella	Research assistant	Mentor (2017-2019)	Laboratory, molecular biology	Ophthalmology resident, Tufts Medical Center
Natalia Han	Master's student	Mentor (2018-2020)	Computational	Consultant RTI - HS
Kofi Vordzorgbe,	Master's student	Mentor (2017-2019)	Laboratory, biochemistry	Medical student, Emory
Michael Smith	Master's student	Mentor (2018-2020)	Laboratory, biochemistry	Natural medicine practitioner
Alex Von Riesemann	College intern	Mentor (2018-2019)	Laboratory, biochemistry	Consultant, Simon-Kucher & Partners
Gabe Marx	Master's student	Mentor (2020-2022)	Computational	Resident, neurology, Mount Sinai
Hadley Walsh	Research assistant	Mentor (2019-2021)	Computational	Medical student, Wake Forest
Hannah Monack	High school intern	Mentor (2019-2020)	Computational	Undergraduate student, Union College
Justin Kauffman	Master's student	Mentor (2020-2022)	Computational	Data scientist, Mount Sinai
Marissa Farinas	Master's student	Mentor (2021-2023)	Computational	Consultant
Malcolm Furman	High school intern	Mentor (2021-2022)	Computational	Undergraduate student, Brown University
Diana Dangoor	Research assistant	Mentor (2021-2023)	Computational	Medical student, University of Illinois Chicago
Ricky Ditzel	Research assistant	Mentor (2022-2023)	Computational	Medical student, Rush University Chicago
Thomas Christie	Research assistant	Mentor (2022-2023)	Computational	Medical Student, SUNY downstate
Meredith Jenkins	College intern	Mentor (2022-2023)	Computational	Undergraduate student, Brown University
Bergan Babrowicz	Master's student	Mentor (2022-2024)	Computational	PhD student, Cornell

TEACHING ACTIVITIES

Teaching Activity/Topic	Level	Role	Indicate Level and Number of Learners Taught, and Venue	Number of hours week/month/yr	Evaluation Summary	Years Taught
General Chemistry	Undergraduate Course	Lecturer and laboratory instructor	Students (25 per class, 100 total)	16 hours per week	N/A	2012-2015
Organic Chemistry	Undergraduate Course	Lecturer and laboratory instructor	Students (25 per class, 100 total)	16 hours per week	N/A	2012-2015

Engineering Standard Curriculum 152, Introduction to MATLAB	Undergraduate Course	Teaching Assistant	Students (35)	3 months per year	N/A	2016
Biostatistics	Graduate Course	Teaching Assistant	Graduate Students (120)	3 months per year	N/A	2018
Neuroanatomy, second year medical lecture	Medical Students	Guest lecture	Medical Students (15)	4 hrs (single lecture)	N/A	2020-present

ADMINISTRATIVE LEADERSHIP APPOINTMENTS

INTERNAL:

General Administration: Digital pathology infrastructure committee at Mount Sinai, Jan 2021

EXTERNAL:

1. American Association of Neuropathologists, Member, Jan 2017-current
2. The Alzheimer's Association International Society to Advance Alzheimer's Research and Treatment (ISTAART) Member, Jan 2017-current

PUBLICATIONS

A. Refereed Original Article in Journal

1. **Farrell K.,** Humphrey J., Chang T., Zhao Y., Leung Y., Kuksa P.P., Patil V., Lee W., Kuzma A.B., Valladares O., Cantwell L.B., Wang H., Ravi A., De Sanctis C., Han N., Christie T.D., Kandoi S., Afzal, R., Whitney K., Krassner M.M., Walsh H., Kim S., Dangoor D., Iida M.A., Casella A., Walker R.H., Nirenberg M.J., Renton A.E., Babrowicz B., Coppola G., Raj T., Höglinger G.U., Golbe L.I., Morris H.R, Hardy J., Revesz T., Warner T.T., Jaunmuktane Z., Mok K.Y., Rademakers R., Dickson D.W., Ross O.A., Wang L., Goate A., Schellenberg G., Geschwind D.H., PSP genetics study group, Crary J.F.*, Naj A.* Genetic, transcriptomic, histological, and biochemical analysis of progressive supranuclear palsy implicates glial activation and novel risk genes (accepted in principal, nature communications)
2. Maldonado-Díaz C., Hiya S., Yokoda R.T., **Farrell K**., Marx G.A., Kauffman J., Daoud E.V., Gonzales M.M., Parker A.S., Canbeldek L., Mahadevan L.S.K., Crary J.F., White III C.L., Walker J.M., Richardson T.E. Disentangling and quantifying the relative cognitive impact of concurrent mixed neurodegenerative pathologies. Acta Neuropathol 147, 58 (2024). https://doi.org/10.1007/s00401-024-02716-y
3. Walker J.M., Orr M.E., Orr T.C., Thorn E.L., Christie T.D., Yokoda R.T., Vij M., Ehrenberg A.J., Marx G.A., McKenzie A.T., Kauffman J., Selmanovic E., Wisniewski T., Drummond E., White III C.L., Crary J.F., **Farrell K.,** Kautz T.F., Daoud E.V., Richardson T.E. Spatial proteomics of hippocampal subfield-specific pathology in Alzheimer's disease and primary age-related tauopathy. Alzheimer's Dement. 2024; 20: 783–797. https://doi.org/10.1002/alz.13484
4. Wang Q., Wang M., Choi I., Sarrafha L., Liang M., Ho L., Farrell K., Beaumont K.G., Sebra R., De Sanctis C., Crary J.F., Ahfeldt T., Blanchard J., Neavin D., Powell J., Davis D.A., Sun X., Zhang B., Yue A., Molecular profiling of human substantia nigra identifies diverse neuron types associated with vulnerability in Parkinson's disease.Sci. Adv.10,eadi8287(2024).DOI:10.1126/sciadv.adi8287
5. McKenzie AT, Nnadi O, Slagell KD, Thorn EL, **Farrell K**, Crary JF. Fluid preservation in brain banking: a review. Free Neuropathol. 2024 Apr 23;5:5-10. doi: 10.17879/freeneuropathology-2024-5373. PMID: 38690035
6. Vizcarra J.C., Pearce T.M., Dugger B.N., Keiser M.J., Gearing M., Crary J.F., Kiely E.J., Morris M., White B., Glass J.D., **Farrell K.,** Gutman D.A., Toward a generalizable machine learning workflow for neurodegenerative disease staging with focus on neurofibrillary tangles. acta neuropathol commun 11, 202 (2023). https://doi.org/10.1186/s40478-023-01691-x
7. Marx, G.A., Kauffman, J., McKenzie, A.T.. Koenigsberg, D.G., McMillan C.T., Morgello S., Karlovich E., Insausti R., Richardson T.E., Walker J.M., White C.L. 3rd, Babrowicz B.M., Shen L., McKee A.C., Stein T.D., The PART Working Group, **Farrell K*.,** John F. Crary* Histopathologic brain age estimation via multiple instance learning. Acta Neuropathol (2023). https://doi.org/10.1007/s00401-023-02636-3
8. Miltenberger-Miltenyi G., Jones A., Tetlow M.A., Conceição V.A., Crary J.F., Ditzel Jr R.M., Farrell K., Nandakumar R., Barton B., Karp B.I., Kirby A., Lett D.J., Mente K., Morgello S., Simon D.K., Walker R.H. Sphingolipid and Phospholipid Levels Are Altered in Human Brain in Chorea-Acanthocytosis Mov. Dis. https://doi.org/10.1002/mds.29445
9. Krassner M., Kauffman J., Sowa A., Cialowicz K., Walsh S., **Farrell K.,** Crary J.F., McKenzie A. Postmortem changes in brain cell structure: a review Free Neuropathology 4-10 PMID: 37384330
10. Zhou X., Cao J., Zhu L., **Farrell K.,** Wang M., Guo L., Yang J., McKenzie A., Crary J.F., Cai D., Tu Z., Zhang B. Molecular differences in brain regional vulnerability to aging between males and females Front. Aging Neurosci. 15-2023 PMID: 37284017

11. McKee A.C., Stein T.D, Huber B.R., Crary J.F., Bieniek K., Dickson D., Alvarez V.E., Cherry J.D., **Farrell K.,** Butler M., Uretsky M., Abdolmohammadi B., Alosco M.L., Tripodis Y., Mez J., Daneshvar D.H. Chronic traumatic encephalopathy (CTE): criteria for neuropathological diagnosis and relationship to repetitive head impacts Acta Neuropath. 145-4 PMID: 36759368
12. Ghanem A., Berry D.S., **Farrell K.,** Cosentino S., Crary J.F., Louis E.D., Cognitive Performance as a Function of MAPT Haplotype: A Prospective Longitudinal Study of an Essential Tremor Cohort. Tremor Other Hyperkinet Mov (N Y) 2023; 13: 19. PMID: 37214541
13. Walker J.M, Goette W., **Farrell K.,** Iida M.A., Karlovich E., PART Working Group, White III C.L., Crary J.F., Richardson T.E., The relationship between hippocampal amyloid beta burden and spatial distribution of neurofibrillary degeneration Alzheimer's Dement. 2023; 1- 13 PMID: 36738450
14. Walker J.M., Gonzales M.M., Goette W., **Farrell K.,** White III C.L., Crary J.F., Richardson T.E., Cognitive and Neuropsychological Profiles in Alzheimer's Disease and Primary Age-Related Tauopathy and the Influence of Comorbid Neuropathologies J Alz Disease. 2023 : 1037 – 1049. PMID: 36847012
15. Marx GA, Koenigsberg DG, McKenzie AT, Kauffman J, Hanson RW, Whitney K, Signaevsky M, Prastawa M, Iida MA, White CL 3rd, Walker JM, Richardson TE, Koll J, Fernandez G, Zeineh J, Cordon-Cardo C, Crary JF, **Farrell K.,** Artificial intelligence-derived neurofibrillary tangle burden is associated with antemortem cognitive impairment Acta Neuropathol Commun. 2022 Oct 31;10(1):157. doi: 10.1186/s40478-022-01457-x. PMID: 36316708
16. Cherry J.D., Baucom Z.H., Eppich K.G., Kirsch D., Dixon E.R., Tripodis Y., Bieniek K.F., **Farrell K.,** Whitney K., Uretsky M., Crary J.F., Dickson D., McKee A.C. Neuroimmune proteins can differentiate between tauopathies. J Neuroinflammation. 2022 Nov 19;19(1):278. doi: 10.1186/s12974-022-02640-6. PMID: 36403052
17. McKenzie, A.T., Marx, G.A., Koenigsberg, D., Sawyer M., Iida M.A., Walker J.M., Richardson T.E., Campanella G., Attems J., McKee A.C., Stein T.D., Fuchs T.J., White III C.L., The PART working group, **Farrell K*.,** Crary J.F*., Interpretable deep learning of myelin histopathology in age-related cognitive impairment. acta neuropathol commun 10, 131 (2022). https://doi.org/10.1186/s40478-022-01425-5
18. **Farrell K.,** Iida M.A., Cherry J.D., Casella A., Stein T.D., Bieniek K.F., Walker J.M., Richardson T.E., White III C.L., Alvarez V.E., Huber B.R., Dickson D.W., Insausti R., Dams-O'Connor K., McKee A.C., Crary J.F., Differential Vulnerability of Hippocampal Subfields in Primary Age-Related Tauopathy and Chronic Traumatic Encephalopathy Neuropathol. Exp. Neurol. 81 (10), October 2022, 781–789 , https://doi.org/10.1093/jnen/nlac066
19. Atherton K., Han X., Chung J., Cherry J.D., Baucom, Z., Saltiel N., Nair E., Abdolmohammadi B., Uretsky M., Khan M.M., Shea C., Durape S., Martin B.M., Palmisano J.N., **Farrell K.,** Nowinski C.J., Alvarez V.E., Dwyer B., Daneshvar D.H., Katz D.I., Goldstein L.E., Cantu R.C., Kowall N.W., Alosco M.L., Huber B.R., Tripodis Y., Crary J.F., Farrer L., Stern R.A., Stein T.D., McKee A.C., Mez J., Association of APOE Genotypes and Chronic Traumatic Encephalopathy JAMA Neurol. 2022;79(8):787–796. doi:10.1001/jamaneurol.2022.1634
20. Bowles K.R., Pugh D.A., Oja L.M., Jadow B.M., **Farrell K.,** Whitney K., Sharma A., Cherry J.D., Raj T., Pereira A.C., Crary J.F., Goate A.M., Dysregulated coordination of MAPT exon 2 and exon 10 splicing underlies different tau pathologies in PSP and AD. Acta Neuropathol 143, 225–243 (2022). https://doi.org/10.1007/s00401-021-02392-2 (Study design, data acquisition, manuscript preparation)
21. Walker J.M., Richardson T.E., **Farrell K.,** White C.L.III, Crary, J.F., The Frequency of Cerebral Amyloid Angiopathy in Primary Age-Related Tauopathy, J Neuropathol. Exp. Neurol. 81 (3) Mar 2022, 246–248, https://doi.org/10.1093/jnen/nlab131 (Data acquisition, manuscript preparation)
22. **Farrell K.,** Kim S.H., Han N., Iida M.A., Gonzalez E., Otero-Garcia M.,Walker J., Richardson T., Renton A.E., Andrews S.J., Fulton-Howard B., Humphrey J., Vialle R.A., Bowles K.R., Whitney K., Dangoor D.K., Marcora E., Hefti M.M., Casella A., Sissoko C., Kapoor M., Novikova G., Udine E., Wong G.,Tang W., Bhangale T., Hunkapiller J., Ayalon G., Graham R., Cherry J.D., Cortes E., Borukov V., McKee A.C, Stein T.D., Vonsattel J.P., Teich A.F., Gearing M., Glass J., Troncoso J.C., Frosch M.P., Hyman B.T., Dickson D.W., Murray M.E., Attems J., Flanagan M.E., Mao Q., Mesulam M.M., Weintraub S., Woltjer R., Pham T., Kofler J., Schneider J.A., Yu L., Purohit D.P., Haroutunian V.,. Hof P.R., Gandy A.,Sano M., Beach T.G, Poon W., Kawas C., Corrada M., Rissman R.A., Metcalf J., Shuldberg S., Salehi B., Nelson P.T., Trojanowski J.Q., Lee E.B., Wolk, D.A., McMillan C.T., Keene D.C., Montine T.J., Kovacs G.G., Lutz M.I., Fischer P., Perrin R.J, Cairns N., Franklin E.E., Cohen H.T., Cobos M.I., Frost B., Raj T., Goate A., White III C.L,, Crary, J.F., Genome-wide association study and functional validation implicates JADE1 in tauopathy. Acta Neuropathol 143, 33–53 (2022). https://doi.org/10.1007/s00401-021-02379-z
23. Walker J.M., White C.L., **Farrell K.,** Crary, J.F., Richardson T.E., Neocortical Neurofibrillary Degeneration in Primary Age-Related Tauopathy J Neuropathol. Exp. Neurol. 2021 Oct. 2021 81 (2), 146-148 https://doi.org/10.1093/jnen/nlab113 (Data acquisition, manuscript preparation)
24. Navarro E., Udine E., Lopes K.P., Parks M., Riboldi G., Schilder B.M., Humphrey J., Snijders G.J.L, Vialle R.A., Zhuang M., Sikder T., Argyrou C., Allan A., Chao M.J., **Farrell K.,** Henderson B., Simon S., Raymond D., Elango S., Ortega R.A., Shanker V., Swan M., Zhu C.W., Ramdhani R., Walker R.H., Tse W., Sano M., Pereira A.C., Ahfeldt T., Goate A.M., Bressman S., Crary J.F., Lotje D.W., Frucht S., Saunders-Pullman R.,

Raj T.,Dysregulation of mitochondrial and proteolysosomal genes in Parkinson's disease myeloid cells Nat Aging 1, 850–863 (2021). https://doi.org/10.1038/s43587-021-00110-x (data acquisition)

25. Iida M.A*, **Farrell K*.,** Walker J.M., Richardson T.E., Marx G., Bryce C.H., Purohit D., Ayalon G., Beach T.G, Bigio B.H, Cortes E., Gearing M., Haroutunian V., McMillan C.T., Lee E.B., Dickson D., McKee A.C., Stein T.D., Trojanowski J.Q., Woltjer R.L., Kovacs G.G., Kofler J.K., Kaye J., White C.L., Crary J.F., Predictors of cognitive impairment in primary age-related tauopathy: an autopsy study Acta Neuropathol Commun 2021 Aug 5;9(1):134. doi: 10.1186/s40478-021-01233-3. *indicates co-first authors
26. Kim S.H., **Farrell K.,** Cosentino S., Vonsattel J.P.G., Faust P,L.,Cortes E.P., Bennet D.A., Louis E.D., Crary J.F.,Tau Isoform Profile in Essential Tremor Diverges From Other Tauopathies J Neuropathol. Exp. Neurol. 2021 https://doi.org/10.1093/jnen/nlab073 (Study design, Data acquisition, manuscript preparation)
27. Richardson T.E., Walker J.M., **Farrell K.,** PART Working Group. Asymmetry of Hippocampal Tau Pathology in Primary Age-Related Tauopathy and Alzheimer Disease J Neuropathol. Exp. Neurol. 2021 80 (5), 436-445 https://doi.org/10.1093/jnen/nlab032 (Data acquisition, manuscript preparation)
28. Walker J.M., Richardson T.E., **Farrell K.,** Iida M.A., Foong C., Shang P., White C.L. III, Crary J.F., PART Working Group Neuropathologists Selective vulnerability of the CA2 hippocampal subfield in primary age-related tauopathy. J Neuropathol. Exp. Neurol. 2021 80 (2), 102-111 https://doi.org/10.1093/jnen/nlaa153 (Study design, data acquisition, manuscript preparation)
29. Kothapalli C.R., Mahajan G, **Farrell K.,** Substrate stiffness induced mechanotransduction regulates temporal evolution of human fetal neural progenitor cell phenotype, differentiation, and biomechanics. Biomater. Sci., 2020,8, 5452-5464. doi.org/10.1039/D0BM01349H (Data acquisition, manuscript preparation)
30. Cherry J.D., Kim S., Stein T.D., Pothast M.J, Huber B.R., Mez J., Malosco M., **Farrell K.,** Alvarez V.E, McKee A.C., Crary J.F., Evolution of neuronal and glial tau isoforms in chronic traumatic encephalopathy. Brain Pathology 30 (5), 913-925 DOI:10.1111/bpa.12867 (Study design, manuscript preparation)
31. **Farrell K.,** Simmers P., Mahajan G., Boytard L., Camardo A., Joshi J., Ramamurthi A., Pinet F, Kothapalli C.R., Alterations in phenotype and gene expression of adult human aneurysmal smooth muscle cells by exogenous nitric oxide. Exp Cell Res 2020 384 (1), 111589
32. Hefti M.H., .Kim S., Belle A.J., Betters A.K., Fiock K.L., Iida M.A., Smalley M., **Farrell K.,** Fowkes M.E., Crary J.F. Tau Phosphorylation and Aggregation in the Developing Human Brain. J Neuropathol Exp Neurol July 2019 (Study design, data acquisition, manuscript preparation)
33. Signaevski M, Prastawa M, **Farrell K,** Tabish N, Baldwin E, Han N, Iida M, Koll J, Bryce C, Purohit D, Haroutunian V, McKee A. C, Stein T, White C.L., Walker J, Richardson T. E, Hanson R, Donovan M, Cordon-Cardo C, Zeineh J, Fernandez G, Crary J.F, Artificial intelligence in neuropathology: deep learning-based assessment of tauopathy. Laboratory Investigation Feb 15 PMID: 30770886 (Study design, data acquisition, manuscript preparation)
34. **Farrell K,** Cosentino S, Iida MA, Chapman S, Bennett DA, Faust PL, Louis ED, Crary JF., Quantitative Assessment of Pathological Tau Burden in Essential Tremor: A Postmortem Study. J Neuropathol Exp Neurol 2019 Jan 78(1); 31–37
35. Hefti MM, **Farrell K,** Kim S, Bowles KR, Fowkes ME, et al., High-resolution temporal and regional mapping of MAPT expression and splicing in human brain development. PLoS One. 2018 Apr 10;13(4) PMID:29634760
36. **Farrell K,** Mahajan G, Srinivasan P, Lee MY, Kothapalli CR, Pediatric glioblastoma cells inhibit neurogenesis and promote astrogenesis, phenotypic transformation and migration of human neural progenitor cells within cocultures, Exp Cell Res. 2018 Jan 1;362(1):159-171. PMID: 29129566
37. **Farrell K,** Joshi J, Kothapalli CR. Injectable uncrosslinked biomimetic hydrogels as candidate scaffolds for neural stem cell delivery.J Biomed Mater Res A. 2016 Oct 31. PMID: 27798959
38. **Farrell K,** Borazjani A, Damaser M, Kothapalli CR. Differential regulation of NSC phenotype and genotype by chronically activated microglia within cocultures. Integr Biol (Camb). 2016 Nov 7;8(11):1145-1157. PMID: 27722366
39. Tasneem S, **Farrell K,** Lee MY, Kothapalli CR. Sensitivity of neural stem cell survival, differentiation and neurite outgrowth within 3D hydrogels to environmental heavy metals. Toxicol Lett. 2016 Feb 3;242:9-22. PMID: 26621541
40. Gishto A, **Farrell K,** Kothapalli CR. Tuning composition and architecture of biomimetic scaffolds for enhanced matrix synthesis by murine cardiomyocytes. J Biomed Mater Res A. 2015 Feb;103(2):693-708.PMID: 24798055 (Study design, data acquisition, manuscript preparation)
41. **Farrell K,** O'Conor D, Gonzalez M, Androjna C, Midura RJ, Tewari SN, Belovich J. Substrate concentration influences effective radial diffusion coefficient in canine cortical bone. Ann Biomed Eng. 2014 Dec;42(12):2577-88.PMID: 25234132

B. Books, Monographs and Chapters

1. **Farrell K,** Joshi P., Roth A., Kothapalli CR., and Lee MY., High-throughput Screening of Toxic Chemicals on Neural Stem Cells. Human Stem Cell Toxicology, 2016, 31-63 DOI:10.1039/9781782626787-00031
2. **Farrell K** and Kothapalli CR. Biomimetic Materials: Polymeric Substrates for Axonal Regeneration Encyclopedia of Biomedical Polymers and Polymeric Biomaterials. Apr 2015, 913 -931

C. Other Articles (Reviews, Editorials, etc.) In Journals; Chapters; Books; other Professional Communications

1. **Farrell K,** Kothapalli CR. Tissue Engineering Approaches for Motor Neuron Pathway Regeneration. Journal of Regenerative Medicine . 2012 October 20; 1(2).

INVITED LECTURES/PRESENTATIONS

1. Understanding common genetic variants influencing PSP risk. Neuro 2024:The PSP and CBD intranational research symposium., Toronto Canada, October 25, 2024
2. Developing a progressive supranuclear palsy genetics to drug discovery pipeline. Tau Consortuim Investigators meeting, September 10, 2024
3. Understanding common genetic variants influencing PSP risk. Demon network speaker series, London England, May 9 2023
4. Integrative genetic, transcriptomic, histological, and biochemical analysis of progressive supranuclear palsy implicates glial activation and new risk genes. Neuro 2023:The PSP and CBD intranational research symposium. London, England Oct 19-20 2023
5. Computer Vision & Machine Learning in Digital Neuropathology 9th Digital Pathology & AI Congress: June 22, 2023
6. Digital Pathology and Machine Learning: Advice from the Engineering Side. 99th Annual Meeting of the American Association of Neuropathologists (AANP). June 7, 2023
7. Session Chair, Next generation of deep learning for healthcare. The new wave of AI in healthcare May 23-24 2023, New York City
8. Investigation of the genetics of Progressive Supranuclear Palsy. Neuro2022: The CurePSP International Research Symposium. Oct 24, 2022
9. Computer Vision & Machine Learning in Digital Neuropathology Fall ADRC meeting Oct 21 2022
10. Investigation of the Clinicopathological and Genetic Signatures of Primary Age-Related Tauopathy. University of Pittsburgh Alzheimer Disease Research Center. Invited by Dr. Julia Kopfler. March 23, 2021
11. Leveraging Machine Learning for Pathogenetic Studies in Age-Related Neurodegeneration. Icahn School of Medicine at Mount Sinai Pathology Grand Rounds. Invited by Carlos Cordon-Cardo. November 18 2021
12. Computer Vision & Machine Learning in Digital Neuropathology Boston University. Science talk Seminars. Invited by Dr. Ann McKee November 30 2021
13. Chronic traumatic encephalopathy and age-related tauopathy, how different are they? Boston University. Science talk Seminars. Invited by Dr. Ann McKee October 20, 2020

VOLUNTARY PRESENTATIONS

1. Farrell K., Iida M.A., Cherry J.D, Stein T.D, Bieniek K.F, Walker J.M., Richardson T.E., Foong C., White III C.L., Casella A., Alvarez V.E., Huber B.R., Dickson D., Crary J.F., McKee A.C. Regional vulnerability to tau pathology in hippocampus differentiates chronic traumatic encephalopathy from primary age-related tauopathy. American Association of Neuropathologist Annual Meeting June 11-14 2020 Virtual Conference.
2. Farrell K., Han N., Renton A., Casella A., Iida M., Cortez E., Bowles K., Raj T., Goate A., Crary JF. Genome-wide association study of progressive supranuclear palsy. Poster Presentation. The tau consortium investigators meeting August 18-21. San Diego California.
3. Farrell K., Han N., Renton A., Casella A., Iida M., Cortez E., Bowles K., Raj T., Goate A., Crary JF. Genome-wide association study of progressive supranuclear palsy. Poster Presentation. The Alzheimer's Association International Conference. July 14-18. Los Angeles California.
4. Farrell K., Han N., Iida M., Walker J., Richardson T., White C., Crary J.F. Clinicopathological correlations in primary age-related tauopathy. Poster Presentation. The Alzheimer's Association International Conference. July 14-18. Los Angeles California.
5. Fudym Y., Farrell K., Crary J.F., White C., Walker J., Richardson T., Asymmetry Between Right and Left Hippocampal Pathology in Primary Age-Related Tauopathy (PART) Podium presentation. American Association of Neuropathologist Annual Meeting June 6-9 2019 Atlanta Georgia.
6. Farrell K., Han N., Iida M., Walker J., Richardson T., Bhangale T., White C., Crary J.F. Identification of common variants influencing risk of primary age-related tauopathy. Poster presentation. American Association of Neuropathologist Annual Meeting June 6-9 2019 Atlanta Georgia.
7. Vordzorgbe J., Kim H.S., Farrell K., Iida M., Walker J., Richardson T., White C., Crary J.F. Enhanced non-amyloidogenic amyloid precursor protein processing is a protective feature of brain aging. Podium presentation. American Association of Neuropathologist Annual Meeting June 6-9 2019 Atlanta Georgia.
8. Farrell K., Han N., Iida M., White C., Walker J., Richardson T., Bhangale T., Crary J.F., Analysis of a post-mortem cohort reveals distinct neuropathological and genetic signatures in primary age-related

tauopathy (PART). Poster Presentation. AD/PD 2019, The International Conference on Alzheimer's and Parkinson's Diseases and related neurological disorders. March 19-26 2019 Lisbon Portugal.

9. Farrell K., Iida M., White C., Walker J., Richardson T., Graham R., Bhangale T., Crary J.F., PART working group. A pilot genetic study reveals candidate risk alleles for primary age-related tauopathy (PART). Poster Presentation. The Alzheimer's Association International Conference July 20-26 2018, Chicago IL.
10. Walker J, Richardson T, Farrell K., Crary JF, Bigio E, Lee E, Foong C, Shang P, White C. Quantification and distribution of neuropathologic changes in primary age-related tauopathy. Podium presentation. American Association of Neuropathologist Annual Meeting. June 7-10 2018, Louisville, KY.
11. Farrell K., Iida M, Crary J.F., PART working group Quantitative assessments of pathology in primary age-related tauopathy. Poster Presentation. Friedman Brain Institute 10th Annual Retreat. April 27 2018, New York, NY.
13. Simmers S., Farrell K., and Kothapalli C.R. Benefits of Nitric Oxide Delivery to Elastogenesis by Adult Human Aneurysm-derived Smooth Muscle Cells. Poster Presentation. Biomedical Engineering Annual Conference October 11–14, 2017 Phoenix, AZ.
14. Farrell K, Srinivasan P., Lee M.Y., and Kothapalli CR. Experimental and Modeling Approaches to Quantify Migration Dynamics of Pediatric Glioblastoma Cells and Human Neural Progenitor Cells within Cocultures. Poster Presentation. Biomedical Engineering Annual Conference October 11–14, 2017 Phoenix, AZ.
15. Farrell K., Louis E., Gutierrez J., Iida M., Cortes E., Faust P., Cosentino S., Vonsattel J.P., Crary J.F., Cognitive impairment in essential tremor is correlated with temporal lobe tauopathy burden. Poster Presentation. Friedman Brain Institute 9th Annual Retreat. April 28 2017 New York, NY.
16. Heft M., Farrell K., Bowles K., Fowkes M., Raj T., Crary J.F., Developmental Changes in Tau Protein Expression and Splicing. Poster Presentation. Friedman Brain Institute 9th Annual Retreat. April 28 2017 New York NY.
17. Farrell K., Lee M.Y., Kothapalli C.R., Pediatric Glioblastoma Cells Modulate Human Neural Progenitor Cell Phenotype and Migration within Cocultures Podium Presentation. Biomedical Engineering Annual Conference, October 5–8 2016 Minneapolis MN
18. Farrell K., Kothapalli C.R., Acutely-activated Microglia Differentially Regulates Neural Stem Cell Phenotype and Genotyp. Podium Presentation. Biomedical Engineering Annual Conference, October 5–8 2016 Minneapolis MN
19. Farrell K., Tasneem S., Lee MY, Kothapalli C.R., Neural Stem Cell Sensitivity to Environmental Heavy Metals. Poster Presentation. Biomedical Engineering Society Annual Conference, Oct 7-10 2015 Tampa FL
20. Farrell K., Kothapalli C.R., Uncrosslinked ECM based Hydrogels Promote NSC Survival and Differentiation within Inflammatory Microenvironment. Podium Presentation, TERMIS Annual Conference, Dec 14 2014 Washington DC
21. A. Gishto, Farrell K., Kothapalli C. R.Tuning Composition and Architecture of Biomimetic Scaffolds for Enhanced Matrix Synthesis by Murine Cardiomyocytes. Poster Presentation, TERMIS annual conference, Dec 14 2014 Washington DC
22. A. Powell, Farrell K., Kothapalli C. R., Mechanisms of Glioma Cell Migration within 3D Biomimetic Microenvironment Poster Presentation. TERMIS annual conference Dec 14 2014 Washington DC
23. Farrell K., Kothapalli C.R.,Matrix microenvironment regulates neural stem cell differentiation into neural and glial lineages Poster presentation. Society For Biomaterials 2014 Annual Meeting and Exposition Apr 17 2014 Denver Colorado
24. Farrell K., Kothapalli C.R., Matrix Microenvironment Regulates Human Mesenchymal Stem Cell (HuMSC) Differentiation into Neural Lineages Poster Presentation. TERMIS annual conference Nov 12 2013 Atlanta GA
25. Farrell K., Baron E., Panel discussion and open forum on math and chemistry education remediation Podium Forum. Cleveland State University and Cengage Learning present Spring 2012 General Chemistry Symposium. Mar 16 2012 Cleveland OH
26. Farrell K., Bonchak J., Davis P., Hipp J., Clark T.,The effect of wetlands on nitrate concentrations Poster Presentation. CERMACS, Central Regional meeting of the American Chemical Society, June 13 2008 Columbus Ohio

MEDIA RESOURCE EDUCATIONAL MATERIALS

Not Applicable