ALENA MARIE SMITH

Neuroscience Ph.D. student *alenasmi@usc.edu*
University of Southern California www.alenaasmith.com
Neuroscience Graduate Program (310) 863-8108

RESEARCH INTERESTS

1. How temporally regulated gene expression during cortical development specifies neuronal identity, connectivity, and lifelong vulnerability to disease
2. Shared cellular mechanisms across neurodevelopmental and neurodegenerative disorders, with a focus on autism risk genes and selective neuronal vulnerability
3. Integrating computational and molecular approaches (spatial transcriptomics, cell-type taxonomies, and biomarkers) to identify developmental origins of resilience to brain aging

EDUCATION

University of Southern California (USC) Los Angeles, CA
Ph.D. in Neuroscience 2025 – present
B.S. in Neuroscience, with honors 2018 – 2022
Minor in Business Administration

AWARDS AND HONORS

Broad Collaborative Challenge Grant, *USC Stem Cell* 2026
Research Assistantship Award, *Children's Hospital of Los Angeles* 2026
Next BioLeader Award for Leadership, *Sundial Initiative* 2026
Graduate Student Fellowship, *USC* 2025
Lewy Body Dementias Best Student Poster Award, *Alzheimer's Association. Int Conference (AAIC)* 2024
Research Highlight for the Alzheimer's Association's Philanthropic Partners, *AAIC* 2024
Renaissance Scholar, *USC* 2022
Dean's List, *USC* 2019, 2020, 2021, 2022

SELECTED TRAINING AND COMPETITIVE PROGRAMS

Cold Spring Harbor Laboratory Cold Spring Harbor, NY
Mouse Development, Stem Cells & Cancer Course June 2026

- Selected by application for CSHL's intensive 3-week lecture and laboratory course on mouse models of mammalian development, stem cell biology, and cancer.
- Hands-on training in CRISPR/Cas9 allele design, zygote microinjection and electroporation, pre- and post-implantation embryo manipulation, in vivo somatic electroporation for cancer modeling, fluorescent in situ hybridization, and live confocal imaging.

Allen Institute for Brain Science Seattle, WA
Cell Types Workshop: Describe Your Neurons Like the Allen Institute Apr. 2026

- Selected as 1 of 30 early-career scientists (from over 200 applicants of graduate students, post-docs, and faculty) for a competitive, fully-funded 3-day workshop on the Allen Institute's cell type taxonomies and open-access tools for characterizing neuronal cell types.
- Trained in using the Brain Knowledge Platform, ABC Atlas, Cell Type Knowledge Explorer, and MapMyCells, with direct application to cortical development and neurodegenerative disease research.

PUBLICATIONS

For a complete list of publications, including preprints, see also A.M. Smith's Google Scholar profile at https://scholar.google.com/citations?user=4IvyshIAAAAJ&hl=en

PEER-REVIEWED PUBLICATIONS

2026 Lorkiewicz, S.A., Abdelnour, C., Bolen, M., **Smith, A.M.**, Shahid-Besanti, M., Hemachandra, D., Müller-Oehring, E., Siddiqui, N., Montoliu-Gaya, L., Arslan, B., Ashton, N. J., Wilson, E. N., Tian, L., Andreasson, K. I., Mormino, E. C., Henderson, V. W., Zetterberg, H., Poston, K. L. Plasma pTau217 as a Prognostic and Monitoring Biomarker of Clinical Progression in Lewy Body Disease. *Neurology*. 107 (11) e218686. PMID: 43013788

2026 **Smith A.M**., Lorkiewicz S.A., Arslan B., Montoliu-Gaya L., Ashton N.J., Wilson E.M., Alcolea D., Rodríguez-Baz I., Fortea J., Young C.B., Winer J.R., Shahid-Besanti M., Vossler H., Plastini M.J., Pan T., Vera-Campuzano E., Sala I., Mendiola J.H., Ramirez V., Kerchner G.A., Andreasson K.I., Henderson V.W., Montine T.J., Tian L., Mormino E.C., Zetterberg H., Poston K.L.*, Abdelnour C.* (2026). Plasma phosphorylated tau 217 detects amyloid-β in Neuronal Synuclein Disease. *npj Parkinson's Disease*. 12, 161 (2026). PMID: 41963316

2024 Abdelnour C., Young C. B., Shahid-Besanti M., **Smith A.M.**, Wilson E. N., Benitez J.R., Vossler H., Plastini M.J., Winer J.R., Kerchner G., Cholerton B., Andreasson K.I., Yutsis M.V., Henderson V., Montine T.J., Tian L., Mormino E.C., Poston K.L. (2024). Plasma pTau181 reveals a pathological signature that predicts cognitive outcomes in Lewy body disease. *Annals of Neurology*, 96(3), 526-538. PMC11324388

2024 Young C. B.*, Cholerton B.*, **Smith A.M.**, Shahid-Besanti M., Abdelnour C., Mormino E. C., Hu S.C., Chung K.A., Peterson A., Rosenthal L.S., Pantelyat A., Dawson T.M., Quinn J., Zabetian C.P., Montine T.J., Poston K.L. (2024). The Parkinson's Disease Composite of Executive Functioning: A Measure for Detecting Cognitive Decline in Clinical Trials. *Neurology*, 103(2), e209609. *These authors contributed equally. PMC11244747

PREPRINTS AND SUBMITTED MANUSCRIPTS

2026 Wu S., Christensen A., McGill C.J., Ajouz L., Wenner J.O., **Smith A.M.**, Gerard C., Dion V., Pike C.J. Effects of estretrol on systemic and neural outcomes in female *APOE4* carriers of the EFAD mouse model of Alzheimer's disease.

2026 Hemachandra D., Younes K., Peterson E.T., Winer J.R., Cobbigo Y., Rosen H.J., Young C.B., **Smith A.M.**, Schulte T., Poston K.L., Müller-Oehring E.M. MRI visible perivascular spaces are associated with disease duration and severity in Parkinson's disease.

RESEARCH POSITIONS

USC Neuroscience Graduate Program Los Angeles, CA
Graduate Rotation Student Sept. 2025 – Apr. 2026
PI: Katherine Matho, Ph.D. Feb. – Apr. 2026

- Investigated the prenatal origins of molecular, cellular, and anatomical differences in the cerebral cortex of a *Chd8* haploinsufficiency mouse model (an autism spectrum disorder genetic risk factor) compared to neurotypical controls. Applied sequential fluorescent RNA in situ

hybridization (seqFISH) to characterize embryonic molecular and cellular signatures during corticogenesis.

PI: Constanza J. Cortes, Ph.D. Nov. 2025 – Feb. 2026

- Investigated whether 16-week voluntary wheel running modulates tau pathology, neuroinflammation, and cognitive performance in a sex-dependent manner in MAPT P301S mice. Performed immunofluorescent staining (AT8, GFAP, IBA-1) and ImageJ-based intensity and microglial morphology analyses; analyzed bulk RNA-Seq, behavioral data (Barnes maze, novel object recognition, elevated plus maze), and running performance.

PI: Christian Pike, Ph.D. Sept. – Nov. 2025

- Quantified estrogen-based modulation of adult hippocampal neurogenesis in ovariectomized 5xFAD mice with humanized APOE4 (n=18) using doublecortin free-floating immunohistochemistry, with sensitivity testing and variance decomposition to identify treatment effects masked by interindividual variability in mature neuron counts. Examined parental transgene inheritance effects on amyloid-β burden in a legacy E3FAD/E4FAD cohort.

Poston Laboratory, Stanford University School of Medicine Stanford, CA

Research Data Analyst 2022 – 2025

PI: Kathleen L. Poston, M.D., M.S. | **Postdoctoral Mentor:** Carla Abdelnour, M.D., Ph.D.

- Evaluated plasma biomarkers (pTau217, pTau181, Aβ42/40, GFAP, NfL) for detecting amyloid co-pathology in Neuronal Synuclein Disease and Lewy body disease; established and validated diagnostic cut-points contributing to two first-author publications.
- Developed and applied statistical pipelines (LASSO regression, ROC AUC analysis, Gaussian mixture models, hypothesis testing with multiple comparison corrections) on multi-cohort longitudinal clinical, neuropsychological, and biomarker data using Python and R.
- Designed an online calculator for the Parkinson's Disease Composite of Executive Functioning (PaCEF), a cognitive composite sensitive to executive decline in PD.
- Served as interim lab manager (Aug–Dec 2023): contributed to U01 and R01 grant submissions, managed 15 IRBs, and established financial and operational protocols for a new ADRC-affiliated study.

Stanford Research Institute, International (SRI) Menlo Park, CA

Research Assistant, Human Neuroscience and Sleep Research Program 2023 – 2025

PI: Tilman Schulte, Ph.D. | **Co-I & Mentor:** Eva M. Müller-Oehring, Ph.D.

- Studied cognitive and motor neurofunctional changes in healthy aging, HIV-associated neurodegeneration, and Parkinson's disease, integrating cognition, mood, sleep physiology, and multimodal neuroimaging.
- Performed quality control on automated MRI-based perivascular space clustering using ITK-snap; constructed and harmonized longitudinal participant databases in REDCap and SharePoint.
- Authored the lab's protocol for research administration of the MDS-UPDRS and SARA motor exams to standardize remote scoring.

USC Brain and Creativity Institute Los Angeles, CA

Undergraduate Research Assistant, USC CANDLE 2019 – 2022

PI: Mary-Helen Immordino-Yang, Ph.D. | **Postdoctoral Mentor:** Rodrigo Riveros, Ph.D.

- Studied adolescent development of self-transcendent purpose through an intergenerational storytelling intervention; transcribed and segmented speech recordings (ELAN) and coded human factors indicative of learning and goal-setting (NVivo).

CONFERENCE ABSTRACTS

ORAL PRESENTATIONS

2025 Mar. **Smith A.M.**, Plastini M.J., Ashton N.J., Montoliu-Gaya L., Wilson E.N., Arslan B., Young C.B., Winer J.R., Shahid-Besanti M., Vossler H., Kerchner G., Cholerton B., Andreasson K.I., Yutsis M.V., Henderson V.W., Montine T.J., Tian L., Mormino E.C., Zetterberg H., Poston K.L., Abdelnour C. Determining the diagnostic accuracy of plasma pTau181, pTau217, Aβ42/40, GFAP, and NFL for detecting amyloidosis in α-synucleinopathies. *9th International Conference on Alzheimer's & Parkinson's Diseases* (Vienna, Austria).

2024 May **Smith A.M**., Plastini M.J., Ashton N.J., Montoliu-Gaya L., Wilson E.N., Arslan B., Young C.B., Winer J.R., Shahid-Besanti M., Vossler H., Kerchner G., Cholerton B., Andreasson K.I., Yutsis M.V., Henderson V.W., Montine T.J., Tian L., Mormino E.C., Zetterberg H., Poston K.L., Abdelnour C. Diagnostic accuracy of plasma biomarkers pTau181 and pTau217 in detecting amyloid co-pathology in Lewy body disease. *Stanford School of Medicine 11th Annual Neuroscience Forum* (Stanford, CA).

2024 May **Smith A.M.**, Plastini M.J., Ashton N.J., Montoliu-Gaya L., Wilson E.N., Arslan B., Young C.B., Winer J.R., Shahid-Besanti M., Vossler H., Kerchner G., Cholerton B., Andreasson K.I., Yutsis M.V., Henderson V.W., Montine T.J., Tian L., Mormino E.C., Zetterberg H., Poston K.L., Abdelnour C. (2024). Plasma pTau181 and pTau217 as biomarkers of Alzheimer's disease co-pathology in Lewy Body Disease. *International NextGen Dementia with Lewy Bodies virtual webinar*.

2024 Apr. **Smith A.M.**, Plastini M.J., Ashton N.J., Montoliu-Gaya L., Wilson E.N., Arslan B., Young C.B., Winer J.R., Shahid-Besanti M., Vossler H., Kerchner G., Cholerton B., Andreasson K.I., Yutsis M.V., Henderson V.W., Montine T.J., Tian L., Mormino E.C., Zetterberg H., Poston K.L., Abdelnour C. Diagnostic accuracy of plasma biomarkers pTau181 and pTau217 in detecting Alzheimer's disease co-pathology in Lewy Body disease. *Alzheimer's Association International Congress Neuroscience Next* (San Francisco, CA).

POSTER PRESENTATIONS

2025 July **Smith A.M.**, Lorkiewicz S.A., Plastini M.J., Ashton N.J., Montoliu-Gaya L., Wilson E.N., Arslan B., Young C.B., Winer J.R., Shahid-Besanti M., Vossler H., Ramirez V., Kerchner G., Andreasson K.I., Henderson V.W., Montine T.J., Tian L., Mormino E.C., Zetterberg H., Poston K.L., Abdelnour C. Diagnostic performance of plasma biomarkers for detecting amyloid co-pathology in Neuronal α-Synuclein Disease. *Alzheimer's Association International Conference* (Toronto, Canada).

2024 Oct. **Smith A.M.**, Plastini M.J., Ashton N.J., Montoliu-Gaya L., Wilson E.N., Arslan B., Young C.B., Winer J.R., Shahid-Besanti M., Vossler H., Kerchner G., Cholerton B., Andreasson K.I., Yutsis M.V., Henderson V.W., Montine T.J., Tian L., Mormino E.C., Zetterberg H., Poston K.L., Abdelnour C. Plasma pTau181 and pTau217 Detect Amyloid Co-pathology and Have Specific Cut-offs in Lewy Body Disease. *International Congress of Parkinson's Disease and Movement Disorders* (Philadelphia, PA).

2024 July **Smith A.M.**, Plastini M.J., Ashton N.J., Montoliu-Gaya L., Wilson E.N., Arslan B., Young C.B., Winer J.R., Shahid-Besanti M., Vossler H., Kerchner G., Cholerton B., Andreasson K.I., Yutsis M.V., Henderson V.W., Montine T.J., Tian L., Mormino E.C., Zetterberg H., Poston K.L., Abdelnour C. Diagnostic accuracy of plasma biomarkers pTau181 and pTau217 in detecting amyloid co-pathology in Lewy body disease. *Alzheimer's Association International Conference* (Philadelphia, PA). ***Recipient of the Lewy Body Dementias Professional Interest Area (LBD PIA) Best Student Poster Award and selected by the Alzheimer's Association to give a poster presentation to philanthropic partners, as a highlight of the type of science discussed at AAIC.**

2024 May **Smith A.M.**, Plastini M.J., Ashton N.J., Montoliu-Gaya L., Wilson E.N., Arslan B., Young C.B., Winer J.R., Shahid-Besanti M., Vossler H., Kerchner G., Cholerton B., Andreasson K.I., Yutsis M.V., Henderson V.W., Montine T.J., Tian L., Mormino E.C., Zetterberg H., Poston K.L., Abdelnour C. Diagnostic performance of plasma pTau181 and pTau217 as biomarkers of Alzheimer's disease co-pathology in Lewy Body disease. *Planning for Prevention of Parkinson's* (Boston, MA).

RESEARCH SKILLS

Computational & Statistical Analysis R, Python, REDCap; statistical analysis of cross-sectional and longitudinal biomarker data (including LASSO regression, ROC AUC analysis, Gaussian mixture models, normality and variance testing, and hypothesis testing with multiple comparison corrections).

Wet Lab & Histology Transcardial perfusion, brain tissue cryosectioning, immunohistochemistry, immunofluorescence, confocal microscopy, PCR genotyping, gel electrophoresis.

Imaging Analysis Confocal microscopy (acquisition and analysis), ImageJ/FIJI (intensity quantification, microglial morphology analysis), ITK-snap (MRI grey/white matter contrast QC).

Clinical Research MDS-UPDRS and SARA motor exam administration; IRB protocol development and management; DUA/MTA compliance.

TEACHING AND MENTORSHIP

Next BioLeader Stanford, CA
Director 2025 – present
Fellow 2024 – 2025

- Expanded a single PhD application workshop series into four series (PhD Application, Physician-Scientist/MD-PhD, Research & Career, Prof-To-Be): 26 workshops to date, averaging 20–25 attendees each.

- Design series themes and schedules, recruit and host speakers (40+ from 19 institutions, including NIH program officers), moderate sessions, secure sponsorship from 12+ industry partners, and build and manage the program website.
- Led workshops on the graduate school application process from a first-gen student perspective, and how articulate one's personal approach to science; review personal statements and advise applicants on interviews one-on-one.
- 9 undergraduate and postbaccalaureate trainees entered graduate programs last cycle (including Harvard, Yale, MIT, and NYU); alumni now return as speakers.

USC First-Generation Student Association Los Angeles, CA
Incoming Freshman Mentor 2021 – 2022

- Mentored fellow first-generation students in their first semester at the University of Southern California; coached mentees as they reached academic and social goals throughout the semester.
- Guided mentees through campus resources such as scholarships, clubs, internships, and undergraduate research opportunities.

LEADERSHIP AND OUTREACH

Alzheimer's Association 2026 – present
ISTAART Ambassador London, UK

- Competitively selected as an International Society to Advance Alzheimer's Research and Treatment (ISTAART) Ambassador to represent the Alzheimer's Association's International Society to Advance Alzheimer's Research and Treatment at AAIC and other Association-hosted conferences.
- Volunteer at AAIC by monitoring session rooms, engaging with session chairs and speakers, and supporting Alzheimer's Association programming both in-person and virtually.
- Participate in monthly meetings with journal editors, grant managers, advisory board members, and other leaders in the Alzheimer's research field.
- Promote ISTAART activities, membership benefits, and research initiatives at USC and across regional networks through presentations and social media outreach.
- Participate in AAIC Neuroscience Next and attend ISTAART webinars to stay current on emerging Alzheimer's research and professional development opportunities.

Connecting Through Art (American Parkinson's Disease Association) Stanford, CA
California Program Director 2024 – 2025
Bay Area Chapter Founder and Director 2023 – 2025

- Founded and directed the Bay Area chapter of the APDA's art therapy program for people with Parkinson's disease, building on my undergraduate thesis; it became the longest-running series in CTA history (22 monthly workshops by the time I handed off leadership to a successor).
- Co-designed original monthly projects with a board-certified art therapist and movement disorders specialists, adapting tools for different stages of disease progression.
- Built partnerships among APDA, Stanford, local senior centers, and patient-caretaker communities, including securing a free, dedicated venue at The Forum in Los Altos.
- Handed off program leadership to a successor before starting graduate school, so the program would continue.

Spanish-Speaking Parkinson's Support Group Stanford, CA
Bay Area Coordinator 2023 – 2025

- Coordinated monthly Parkinson's disease support group meetings for the underrepresented and underserved Hispanic community in the Bay Area.
- Conducted bi-monthly discussions with the APDA and the Stanford Information & Referral Center to build outreach networks that improve resource accessibility and extend outreach to underserved groups.
- Liaised between the group leader, the group's participants, and research recruitment teams.
- Elevated research participation in local Hispanic communities through outreach.

PROFESSIONAL ACTIVITIES

Invited Talks and Presentations

2026 Nov. Mind Meets Masterpiece ft. Neuroscience PhD Student Alena Smith, *Nazfia's Network (podcast episode)*
2026 Aug. Demystifying the Bioscience PhD – How to determine good research program fit in the graduate admissions processes, *Next BioLeader PhD Application Series (Stanford, CA)*
2026 May Plasma Biomarkers for Detecting Alzheimer's Disease Co-Pathology in Lewy Body Disease, *MJFF Parkinson's Precision Medicine Initiative (virtual invited presentation)*
2026 Mar. The Outsider's Advantage: Lessons from Olympic Athletes and Nobel Laureates, *USC Neuroscience Graduate Forum Annual Symposium (Los Angeles, CA)*
2025 June Reflections on the PhD Application Journey and Practical Advice for Applicants, *Next BioLeader PhD Application Series (Stanford, CA)*
2024 Nov. Lewy Body Dementias ISTAART Professional Interest Area Journal Club, co-hosted with Salomón Salazar-Londoño *(virtual webinar)*

Invited and Elected Positions

2026 Sept. USC Neuroscience Graduate Forum Newsletter Editor-in-Chief (year-long position)
2026 Apr. International Youth Neuroscience Association (INYA) Ideathon Finalist Judge (virtual)
2025 July Lewy Body Dementias PIA Alzheimer's Association International Conference 2025 Poster Judge (Toronto, CA)
2024 May What About Co-Pathologies? (workshop moderator), Planning for Prevention of Parkinson's Conference (Boston, MA)

Scientific Communications (non-peer reviewed)

2026 Oct. USC Neuroscience Graduate Forum Monthly Newsletter (October). USC Neuroscience Graduate Program.
2025 Jan. 2024-2025 Poston Lab Annual Research Report. Stanford University School of Medicine.
2024 Jan. 2023-2024 Poston Lab Annual Research Report. Stanford University School of Medicine.
2021 June The Artistic Spark and Therapeutic Power of Self-Expression in Parkinson's Disease (Undergraduate thesis). University of Southern California.

Reviewer for: *npj Parkinson's Disease*, *Journal of Alzheimer's Disease*, *BMJ Neurology Open*

ADDITIONAL EXPERIENCE

Menlo Park Strength Studio (MPX) Menlo Park, CA

Certified Personal Trainer and Group Fitness Instructor 2023 – 2025

- Lead group strength classes (> 600 classes) on the X-Former machine

Stanford Movement Disorders Clinic Stanford, CA

Shadow under Kathleen L. Poston, MD, MS (Chief of Movement Disorders) 2023 – 2024

- Shadowed the MDS-United Parkinson's Disease Rating Scale (MDS-UPDRS) and the Scale for Assessment and Rating of Ataxia (SARA), gained proficiency in administering the MDS-UPDRS and SARA motor exams to research participants.
- Created the lab's protocol on administering the MDS-UPDRS and SARA for research purposes, to guide video collection for remote exam scoring and data analysis.

Cedars Sinai Emergency Department Los Angeles, CA

Volunteer in Patient Bedside Care May – Nov. 2021

- First point of contact for incoming patients, facilitated incoming patient management: directed patients to appropriate waiting areas based on respiratory symptoms and guided families to visitor waiting areas.
- Provided patient bedside care in the Emergency Department: prepared beds, served food and water, and directed family to proper rooms.
- Supported triage nurses in promoting COVID-19 preventative measures such as mask-wearing and social distance enforcement in Emergency Department waiting areas.