# Vahan Aslanyan

Los Angeles, CA

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## EDUCATION

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| **University of Southern California** | **Los Angeles, CA** |
| *Biostatistics,* **PhD** | December 2024 |

*Dissertation Topic*: Adaptive Randomization in Randomized Controlled Trials with Applications in Alzheimer's Disease

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| **University of California, Berkeley** | **Berkeley, CA** |
| *Applied Mathematics & Statistics,* **BA** | May 2018 |

## SKILLS

**Statistical Software & Programming Languages**: R, SAS, STATA, STAN, PASS, nQuery, Python, SQL, Julia.
**Statistical Methodology**: Survival Analysis, Longitudinal Analysis, Regression Analyses, Statistical Computing
**Statistical Approaches**: Causal Inference, Bayesian Inference.
**Clinical Study Design**: Power Analysis, Protocol and Statistical Analysis Plan development.
**Neuroimaging**: Freesurfer, SPM, CAT12, AFNI.
**Miscellaneous**: Git and GitHub, Bash, MATLAB, Adobe Illustrator.

## PROFESSIONAL EXPERIENCE

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| **Keck School of Medicine of USC** | **Los Angeles, CA** |
| *Research Assistant* | August 2020–Present |

- Presented research projects to an audience of 1000+ research experts in international conferences.
- Completed 3 independent and 7 collaborative research projects and published in leading scientific journals.
- Designed a new randomization approach to minimize allocation of patients to inferior treatments.
- Led analytical strategies for 10+ research projects to streamline project completion.
- Collaborated with cross-functional teams of 20 to develop study protocols and statistical analysis plans.
- Taught *Data Analysis for Categorical Data* to a class of 25 graduate students for a semester.

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| **Vertex Pharmaceuticals, Inc.** | **Boston, MA** |
| *Biostatistics PhD Intern* | May 2024–August 2024 |

- Explored statistical methodology addressing informative drop-out in longitudinal data.
- Developed R programs for mitigating informative drop-out and assessed the effect of dropout on study findings.
- Performed simulations to compare shared parameter and pattern mixture modeling approaches.

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| **Institute of Neuroimaging and Informatics, Keck School of Medicine of USC** | **Los Angeles, CA** |
| *Project Assistant* | June 2018–August 2020 |

- Integrated data from 4 multisite aging cohort studies, totaling over 30,000 participants.
- Created dashboards in R Shiny for efficient exploratory analysis of cohorts.
- Led monthly R workshops for lab members, helped to migrate research projects to R, and increased lab productivity.

## CLINICAL STUDY EXPERIENCE

**Exercise in Adults With Mild Memory Problems [Phase III] (NCT02814526)**　　　June 2022–Present
- Validated study findings in SAS to ensure accuracy and performed ad hoc analyses for exploratory objectives.
- Spearheaded post hoc analyses to contextualize study findings for general public.
- Produced Tables, Listings, and Figures (TLFs) in R and Adobe Illustrator for publications and submissions.

**Lifestyle Enriching Activities for Research in Neuroscience [Exploratory](NCT02726906)**　July 2018–Present
- Drafted and executed statistical analysis plans for comparing two interventions across various outcomes.
- Lead outcome reporting efforts, created TLFs for publications and presentations.
- Developed pipelines for processing cognitive batteries and extracting activity data from wrist accelerometers.

**Safety and Pharmacokinetics of CS6253 [Phase I] (NCT05965414)**　　　August 2024–October 2024
- Collaborated with clinical investigators and vendors to ensure data integrity and quality.
- Implemented R scripts to execute the statistical analysis plan and advised on post-hoc analyses.
- Generated TLFs for reporting of results, manuscript and grant submissions.

**Safety, Tolerability, PK and PD of Posiphen [Phase Ib](NCT02925650)**  August 2022–May 2024
- Validated primary findings in R to ensure accuracy and evaluated exploratory objectives.
- Generated TLFs for inclusion in publications, conference presentations, and regulatory filings.
- Implemented stable isotop labeling kinetics algorithms in Julia to evaluate protein production rates.

## RESEARCH EXPERIENCE

**Covariate adjustment in Bayesian response adaptive randomization (RAR)**  August 2022–present
- Conducted simulation studies to assess the impact of covariate adjustment on imbalance in RAR.
- Explored whether direct versus stratified adjustment may lead to less covariate imbalance.

**Sample size re-estimation (SSR) for response adaptive randomization**  December 2023–present
- Created a framework for assessing sample sizes in a closed form for known and unknown outcome variances.
- Assessed feasibility of implementing RAR with SSR by applying the framework to real world examples.

**Stopping criteria for RAR trials with sample size re-estimation**  March 2024–present
- Combined efficacy and futility criteria under frequentist framework with RAR design with sample size re-estimation.
- Compared the characteristics of the proposed design with group-sequential design.

## PUBLICATIONS

### PUBLISHED

1. **Aslanyan V.**, Mack W.J., Ortega N.E., Nasrallah I.M, Pajewski N.M., Williamson J.D., Pa, J., Cerebrovascular reactivity in Alzheimer's disease signature regions is associated with mild cognitive impairment in adults with hypertension. *Alzheimer's Dement. (2024)*, doi:10.1002/alz.13572.

2. **Aslanyan V.**, Ortega N.E., Fenton L., Harrison T.M., Raman R., Mack W.J., Pa J., Protective effects of sleep duration and physical activity on cognitive performance are influenced by -amyloid and brain volume but not tau burden among cognitively unimpaired older adults. *NeuroImage: Clinical (2023)*, doi:10.1016/j.nicl.2023.103460.

3. **Aslanyan V.**, Pa J., Hodis H.N., St. John J., Kono N., Henderson V., Mack W. J., Generalizability of cognitive results from clinical trial participants to an older adult population: addressing external validity.*Alzheimer's and Dementia: Diagnosis, Assessment Disease Monitoring (2023)*, doi:10.1002/dad2.12417.

4. Ortega N.E., **Aslanyan V.**, Pa J., Sex influences whether hippocampal volumes mediate the relationship between depression and cognition in non-demented older adults: A UK Biobank study.*Brain Imaging and Behavior (2024)*, doi:10.1007/s11682-024-00930-6.

5. Contreras J. A., **Aslanyan V.**, Albrecht D.S, Mack W. J., Pa J. Higher baseline levels of CSF inflammation increase risk of incident mild cognitive impairment and Alzheimer's disease dementia. *Alzheimer's and Dementia: Diagnosis, Assessment Disease Monitoring (2022)*, doi:10.1002/dad2.12346.

6. Pa J., **Aslanyan V.**, Casalleto K., Renteria M.A., Harrati A., Tom S.E, Armstrong N.M, Rajan K.B., Avila-Rieger J., Gu Y., Manly J.J, Brickman A.M., Zahodne L.B., Sex and APOE4 interactions modify the associations between lifestyle activities and cognitive reserve. *Neurology (2022)*, doi:10.1212/WNL.0000000000200675.

7. Contreras J. A., **Aslanyan V.**, Sweeney M., Sanders L., Sagare A., Zlokovic B., Toga A., Han S.D., Morris J., Fagan A., Massoumzadeh P., Benzinger T., & Pa J., Functional connectivity among brain regions affected in Alzheimer's Disease is associated with CSF TNF-$\alpha$ in APOE4 carriers. *Neurobiology of Aging (2020)*, doi:10.1016/j.neurobiolaging.2019.10.013.

8. Fenton L., Isenberg L., **Aslanyan V.**, Albrecht D., Contreras J., Stradford J., Monreal T., & Pa J., Variability in objective sleep is associated with Alzheimer's pathology and cognition. *Brain Communications (2023)*, doi:10.1093/braincomms/fcad031.

9. Casaletto K., Nichols E., **Aslanyan V.**, Simone S., Rabin J., LaJoie R., Brickman A.M., Dams-O'Connor K.,Palta P., Kumar R.G., George K.M., Satizabal C.L., Schneider J., & Pa J., Sex-specific effects of microglial activation on Alzheimer's disease proteinopathy in older adults. *Brain (2022)*, doi:10.1093/brain/awac257.

10. Galasko D., Farlow M., Lucey B., Honig L., Moghekar A., Elbert D., Bateman R., Momper J., Thomas R., Rissman R., Pa J., **Aslanyan V.**, Balasubramanian A., Maccecchini M., Feldman H., A multicenter, randomized, double-blind, placebo-controlled ascending dose study to evaluate the safety, tolerability, pharmacokinetics (PK) and pharmacodynamic (PD) effects of Posiphen® in subjects with Early Alzheimer's Disease.*Alzheimer's Research Therapy (2024)*, doi: 10.1186/s13195-024-01490-z

**UNDER REVIEW**

1. **Aslanyan V.**, Pickering T., Nuño M., Renfro L.A., Pa J., Mack W.J., Bayesian response adaptive randomization for randomized clinical trials with continuous outcomes: the role of covariate adjustment.
2. **Aslanyan V.**, Nuño M., Pickering T., Renfro L.A., Pa J., Mack W.J., Sample Sizes for Randomized Controlled Trials Utilizing Bayesian Response Adaptive Randomization for Continuous Outcomes.
3. **Aslanyan V.**, Renfro L.A.,Nuño M., Pickering T., Pa J., Mack W.J., Considerations for Decision-making in Bayesian Response Adaptive Randomized Trials with Sample Size Re-estimation.
4. Nichols E., **Aslanyan V.**, Adrien T.V., Andrews R. M, Fardo D. W., Gavett B.E., Paterson T.S.E., Turney I.C., Young C.B., Uanhoro J.O., Gross A.L. for the Alzheimer's Disease Neuroimaging Initiative, Measurement error and methodologic issues in analyses of the proportion of variance explained in cognition.
5. Shadyab A.H., **Aslanyan V.**, Jacobs D.M., Salmon D.P., Morrison R., Katula J.A., Jin S., Thomas R.G., LaCroix A.Z., Pa J., Cotman C.W., Feldman H.H., Baker L.D. for the ADCS EXERT Study Group, Effects of exercise vs. usual care on amnestic mild cognitive impairment: EXERT vs. ADNI.
6. Fenton L., **Aslanyan V.**, Jacobs D.M., Salmon D.P., Brewer J.B., Rissman R.A., Shadyab A.H., Harrison T.M., LaCroix A.Z., Feldman H.H., Baker L.D. & , Pa J. for the EXERT Study Group, Relationships between fine memory discrimination and tau burden in two independent cohorts of older adults.
7. Digma L.A., **Aslanyan V.**,Brewer J.B.,Bevins E.A., Katula J.A., Chmelo E., Hodge H., LaCroix A.Z., Shadyab A.H., Jacobs D.M., Salmon D.P., Howard Feldman H.,Pa J. amp; Baker L.D., for the EXERT Study Group.
8. Baker L.D., Pa J., Katula J.A., **Aslanyan V.**, Salmon D.P., Jacobs D.M., Chmelo A.E., Hodge H., Morrison R., Matthews G., Brewer J., Jung Y., Rissman R.A., Taylor C., Leger G., Messer K., Evans A.C., Okonkwo O., Shadyab A.H., Zou J., Jin S., Thomas R., Zhang J., La Croix A., Cotman C., Feldman H., for the EXERT Study Group, Effects of Exercise on Cognition and Alzheimer Biomarkers in a Randomized Controlled Trial of Adults with Mild Cognitive Impairment: The EXERT Study.
9. Eckhardt J.L., Isenberg A.L., **Aslanyan V.**, Stradford J., Fenton L., Contreras J.A., Mack W., Pa J., Circadian rhythm timing and fragmentation are associated with Alzheimer's disease biomarkers and poorer cognition in older adults.

# PRESENTATIONS

### INVITED TALKS

1. August 2024. *Direct versus stratified covariate adjustment in continuous outcome adaptive randomization for randomized controlled trials.* Contributed Paper: Joint Statistical Meetings, Portland, OR.
2. July 2023. *Protective effects of sleep duration and physical activity on cognitive performance are influenced by $\beta$-amyloid and brain volume but not tau burden among cognitively unimpaired older adults.* Invited talk: Alzheimer's Association's International Conference, Amsterdam, Netherlands.
3. April 2022. *Protective effects of sleep duration and physical activity on cognitive performance are influenced by $\beta$-amyloid and brain volume.* Invited talk: Alzheimer's Therapeutic Research Institute, USC, San Diego, CA.

### POSTER PRESENTATIONS

1. **Aslanyan V.**, Ortega N.E., Mack W. J., Pa J., 2024. Joint modeling of longitudinal AD cognitive markers and incident MCI/dementia quantifies the longitudinal cognitive—AD risk relationship. Presented at Alzheimer's Association's International Conference, Philadelphia, PA.
2. **Aslanyan V.**, Hodis H.N., St. John J., Kono N., Henderson V., & Mack W. J., 2022. Generalizability of cognitive results from clinical trial participants to older adult population: addressing external validity. Presented at Clinical Trials on Alzheimer's Disease Conference, San Francisco, CA.
3. **Aslanyan V.**, Mack W.J., Ortega N.E., Williamson J.D., Pa J., 2022. Baseline hippocampal vascular reactivity predicts conversion to mild cognitive impairment: an analysis of the SPRINT-MIND study. Presented at Alzheimer's Association's International Conference, San Diego, CA.
4. **Aslanyan V.**, Ortega N.E., Mack W.J., Pa J., 2021. Sex differences in the association between smoking status and increased incidence of Alzheimer's dementia.Presented at Alzheimer's Association's International Conference, Virtual.