

SEA-AD: What's New, July 2026

New data

- **Multi-region data set:** Single-nucleus RNA-seq, ATAC-seq, and Multiome from ~7 million nuclei across ten neo- and allocortical regions spanning the full arc of AD staging in the same 84-donor cohort.
- **Expanded cell type taxonomy:** A unified taxonomy of 207 cell types, including regionally specialized populations and new cell types added through the multi-region study.
- **Caudate nucleus:** Raw and processed single-nucleus data plus processed spatial transcriptomics for the caudate nucleus.
- **Quantitative neuropathology:** Image-based pathology quantifications now span nearly all brain regions with -omics data, extending SEA-AD's ability to connect molecular changes with neuropathological burden.

New science

- **Multi-region paper:** Cellular vulnerability is remarkably consistent across the brain, with the same ~30% of cell types changing across regions. The study identifies a stereotyped sequence of cellular changes, unexpected vulnerability of primary visual cortex neurons, and neuronal hyperexcitability as a potential convergent mechanism of vulnerability.
- **Caudate paper:** The first SEA-AD characterization of a major subcortical structure, revealing cell-type composition and Alzheimer's disease-associated changes in the caudate nucleus.
- **B-BIND:** Publication of the statistical framework underlying SEA-AD's continuous ordering of donors by pathological burden and disease progression.
- **scVIP:** An AI framework that learns personalized disease trajectories from single-cell data and pathology measurements, enabling improved neuropathology prediction, cross-cohort integration, and identification of disease-associated cell populations.
- **Methods advances:** Additional computational tools and the SEA-AD DREAM Challenge continue to expand the analytical ecosystem built around SEA-AD data.

New on SEA-AD.org

- **New data in interactive tools:** Data from the two new studies now (or soon) available in the ABC Atlas resources, with the multi-region taxonomy available for mapping in MapMyCells.
- **ABC Atlas Access:** Jupyter notebook-based access for downloading and exploring SEA-AD datasets, including expanding support for caudate and multi-region resources.
- **New 'Our Code' website:** A centralized collection of SEA-AD software repositories, analysis pipelines, notebooks, and publication companion code.
- **Updated data and documentation:** Expanded data files, change logs, and documentation reflecting new data and updated analytic methods.
- **Refreshed SEA-AD.org:** Website updated to reflect all changes above along with the expanded SEA-AD team.

New funding has extended the SEA-AD team to more than a dozen sites, and will lead to a larger, more heterogeneous cohort, spanning additional brain regions and data modalities, while continuing to build open resources for the community.