

### Training and Education

Ph.D, Bioinformatics, UCSF  
B.A, Biology, Vassar College

2021-present  
2014

### Awards and Fellowships

NSF GRFP Honorable Mention

2022

Vassar College Undergraduate Summer Research Institute Fellowship

2013

### Teaching

Teaching assistant, BMI 203 (Algorithms)

2023

### Publications

#### **Papers:**

1. Pasquini, Lorenzo, Gianina Toller, Adam Staffaroni, Jesse A. Brown, Jersey Deng, **Alex Lee**, Katarzyna Kurcyus, et al. "State and Trait Characteristics of Anterior Insula Time-Varying Functional Connectivity." *NeuroImage* 208 (March 1, 2020): 116425. <https://doi.org/10.1016/j.neuroimage.2019.116425>.
2. Mantyh, William G., Salvatore Spina, **Alex Lee**, Leonardo Iaccarino, David Soleimani-Meigooni, Elena Tsoy, Taylor J. Mellinger, et al. "Tau Positron Emission Tomographic Findings in a Former US Football Player With Pathologically Confirmed Chronic Traumatic Encephalopathy." *JAMA Neurology* 77, no. 4 (April 1, 2020): 517–21. <https://doi.org/10.1001/jamaneurol.2019.4509>.
3. Pasquini, Lorenzo, Susanna L. Fryer, Stuart J. Eisendrath, Zindel V. Segal, **Alex J. Lee**, Jesse A. Brown, Manish Saggar, and Daniel H. Mathalon. "Dysfunctional Cortical Gradient Topography in Treatment Resistant Major Depression." *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging* 0, no. 0 (October 31, 2022). <https://doi.org/10.1016/j.bpsc.2022.10.009>.
4. Brown, Jesse A., **Alex J. Lee**, Lorenzo Pasquini, and William W. Seeley. "A Dynamic Gradient Architecture Generates Brain Activity States." *NeuroImage* 261 (November 1, 2022): 119526. <https://doi.org/10.1016/j.neuroimage.2022.119526>.
5. Pasquini, Lorenzo, Fatemeh Noohi, Christina R. Veziris, Eena L. Kosik, Sarah R. Holley, **Alex Lee**, Jesse A. Brown, et al. "Dynamic Autonomic Nervous System States Arise during Emotions and Manifest in Basal Physiology." *Psychophysiology* n/a, no. n/a (November 13, 2022): e14218. <https://doi.org/10.1111/psyp.14218>.
6. Chow, Tiffany E., Christina R. Veziris, Renaud La Joie, **Alex J. Lee**, Jesse A. Brown, Jennifer S. Yokoyama, Katherine P. Rankin, et al. "Increasing Empathic Concern Relates to Salience Network Hyperconnectivity in Cognitively Healthy Older Adults with Elevated Amyloid- $\beta$  Burden." *NeuroImage: Clinical* 37 (2023): 103282. <https://doi.org/10.1016/j.nicl.2022.103282>.
7. Cahill, Robert, Yu Wang, **Alex Lee**, Hongkui Zeng, Bin Yu, Bosiljka Tasic, and Reza Abbasi-Asl. "Unsupervised Pattern Discovery in Spatial Gene Expression Atlas Reveals Mouse Brain Regions beyond Established Ontology." *bioRxiv*, March 12, 2023. <https://doi.org/10.1101/2023.03.10.531984>. (in review)

#### **Preprints:**

1. **Lee, Alex J.**, Robert Cahill, and Reza Abbasi-Asl. "Machine Learning for Uncovering Biological Insights in Spatial Transcriptomics Data." *arXiv*, March 29, 2023. <https://doi.org/10.48550/arXiv.2303.16725>. (in review)

2. **Lee, A. J.**, Spina, S., Vatsavaiyai, S., Li-Nana, A., Hwang, J. H., Gaus, S., Meyer, D., Seeley, W. W. Expert-level segmentation of postmortem human brain tissue for neurodegenerative disease research. (*in preparation*)

#### **Conference abstracts:**

1. Zhang, Liwen, Taru M. Flagan, Stephanie A. Chu, Suvi Häkkinen, Jesse A. Brown, **Alex Jihun Lee**, Lorenzo Pasquini, et al. "Presymptomatic and Symptomatic MAPT Mutation Carriers Feature Functional Connectivity Alterations." *Alzheimer's & Dementia* 17, no. S4 (2021): e054128. <https://doi.org/10.1002/alz.054128>.
2. Flagan, Taru M., Stephanie A. Chu, Suvi Häkkinen, David McFall, Carolin Heller, Jonathan D Rohrer, Jesse A. Brown, et al. "Complement and NfL Associations with Brain Structure and Functional Connectivity Alterations in Presymptomatic and Symptomatic GRN Mutation Carriers." *Alzheimer's & Dementia* 17, no. S4 (2021): e050737. <https://doi.org/10.1002/alz.050737>.
3. Brown, Jesse A., **Alex Jihun Lee**, Lorenzo Pasquini, Adit Friedberg, Gil D. Rabinovici, Joel H Kramer, Maria Luisa Gorno Tempini, Howard J. Rosen, Bruce L. Miller, and William W. Seeley. "Local Neurodegeneration and Global Connectivity Adaptation across the FTD-AD Spectrum." *Alzheimer's & Dementia* 17, no. S6 (2021): e055308. <https://doi.org/10.1002/alz.055308>.

#### Research Experience

**Graduate Research Assistant**, Abbasi Lab, UCSF 2022-present  
I work on development of interpretable machine learning methods for projects in neuroscience and molecular biology. My thesis project investigates usage of multimodal data integration techniques to characterize novel cell circuits in the mouse brain.

**Research associate II**, Seeley lab, UCSF 2018-2021  
I developed several computational pipelines to process very large datasets of MRI and other large imaging modalities to study the human brain both in health and disease. I specialized in studying brain network activity changes in dementia patients and in automated image analysis for human brain pathology slide characterization.

**Research associate II**, Nano Precision Medical now Vivani Medical 2015-2018  
I worked on methods to implement proof-of-concept and in vivo testing of a novel implantable drug delivery device based on nanomaterial engineering. I developed new test methods to study both the nanofabrication process and the interactions of nanostructured materials with drug products. I helped develop novel formulations for very long term (6+ months) stabilization of peptide therapeutics and for sterile preparation of the device prior to implantation in in vivo tests.

**Volunteer research assistant**, Berkeley Biolabs 06/2013-12/2013  
I worked on a project using basic molecular biology techniques for cloning of proteins (VEGF, FGF2) in a low resource setting, also helping to coordinate classes for community members interested in molecular biology and visiting co-op students from Laney College.

**Research assistant**, Straus lab, Vassar College

2013-2014

I conducted a thesis project studying *Tetrahymena thermophila* as a model for phagocytotic activity using fluorescent microscopy and basic molecular biology techniques, quantifying preferential uptake of different substrates in response to disruption of actin or microtubule structure.

**Research assistant**, Smart lab, Vassar College

05/2013-09/2013

I worked as a summer research assistant developing a novel carbon nanotube synthesis reactor and using mass spectrometry to quantify the nanotube production process. We also prototyped a novel toxic gas sensor by using nanotube arrays as field-effect transistors.