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Extracellular ASC Level as a Potential Biomarker for Alzheimer’s Disease
Qi "Phoebe" Dong¹, Shanya Jiang¹, Kathryn Sanchez², Gary Rosenberg³ and Kiran Bhaskar¹
Departments of ¹Molecular Genetics and Microbiology, ²Neurology and Center for Memory and Aging

Background
There is mounting evidence of a link between pathological tau (p-tau) and neuroinflammation in a group of neurodegenerative diseases named tauopathies including Alzheimer’s Disease (AD). ¹,² In our previous studies, we found that p-tau can induce neuroinflammation through activating inflammasomes, a multi-protein complex that can recognize a variety of danger signals such as bacterial toxins like lipopolysaccharide (LPS), nigericin and endogenous danger signals such as extracellular ATP and p-tau. ³ We aim to obtain quantitative measurements of activated inflammasomes, specifically the levels of ASC (apoptosis-associated speck-like protein containing a CARD) specks, a key adaptor protein of inflammasomes, in the Cerebrospinal Fluid (CSF) samples of AD patients.

Methods

Results
ASC specks released by immortalized mouse macrophages that constitutively express ASC conjugated to the fluorescent protein cerulean

Conclusions
Our results indicate Amnis can be used for detecting extracellular ASC specks. We also found there are more extracellular ASC specks in AD CSF samples compared to healthy controls. These results suggest that differential levels of ASC specks in extracellular environments including CSF may correlate with the disease severity and serve as a biomarker for AD and related dementia, which needs further investigation.

Future Directions
Experiments involving various negative controls will be performed to standardize accurate ASC level measurements. Correlation between ASC levels and disease progression will be further investigated.

References

Acknowledgements
University of New Mexico School of Medicine – MD Program
University of New Mexico Department of Molecular Genetics and Microbiology
UNM AIM CoBRE Core facility and special thanks for Dr. Sharina P. Desai
Funding: NIN/NINDS - RF1NS083704-05A1