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A tau antibody for detecting and treating Alzheimer's disease

An antibody for detecting, screening, and inhibiting Tau products critical in Alzheimer’s disease

IP Status: US Patents Issued; Patent Numbers 9,200,068 and 9,605,042

Applications

- Screening Alzheimer’s treatments
- Treatment of Alzheimer’s disease
- Detection of Tauopathy or Alzheimer’s disease

Key Benefits & Differentiators

- **Targets underlying cause of Alzheimer’s:** Targets an enzyme in the pathway of a product associated with cognitive dysfunction and Alzheimer’s

Technology Overview

Alzheimer's disease (AZ) is a common cause of morbidity and mortality in older adults. In the US over 6.9 million people over the age of 65 are affected by AZ. AZ is characterized by the accumulation of amyloid plaques, composed of Aβ proteins, and neurofibrillary tangles, composed of tau proteins. Formation of a pathogenic form of Aβ, but not tau, initiates Alzheimer's disease, however, Aβ proteins require tau proteins to impair memory function. Tau is therefore an Aβ effector molecule. The clinical observation that amyloid plaques deposit before abnormal increases in spinal fluid tau is consistent with this idea. Currently, the majority of Alzheimer’s treatments focus on symptomatically treating the disease or reducing amyloid plaque break-up but none successfully treat the underlying cause of the disease.

Researchers at the University of Minnesota have developed an antibody that targets tau proteins that could be used for AZ therapeutic and diagnostic purposes. Specifically, these antibodies bind to Δtau314, a product of caspase-2 cleaving tau at Asp314, that is necessary and sufficient for tau to infiltrate dendritic spines. This Δtau314 fragment reversibly impairs memory function in mice. In an article published in Nature Medicine, it was shown that the expression of tau mutants that resisted caspase-2 cleavage prevented tau from infiltrating spines, dislocating glutamate receptors, and impairing synaptic function in cultured neurons, and it prevented memory deficits and neurodegeneration in mice. These results demonstrate the potential for antibodies that target tau products can play a critical role in drug discovery and treatment for Alzheimer’s disease.

Phase of Development

TRL: 2-3
Designed and synthesized new peptide inhibitors of caspase-2 as well as a novel assay for identifying additional inhibitors of caspase-2 tau cleavage.

Desired Partnerships

Technology ID
20130020

Category
All Technologies
Life Sciences/Biomarkers
Life Sciences/Biochemicals & Small Molecules
Life Sciences/Diagnostics & Imaging
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Press Releases

Science Translational Medicine 2 Nov 2016

Researchers

- **Karen Ashe, MD, PhD** Professor, Department of Neurology
- **Michael A. Walters, PhD** Research Associate Professor, Department of Medicinal Chemistry

References

1. Xiaohui Zhao, Linda A Kotilinek, Benjamin Smith, Chris Hlynialuk, Kathleen Zahs, Martin Ramsden, James Cleary & Karen H Ashe(2016) , https://www.nature.com/articles/nm.4199, Nature Medicine, 22, 1268-1276