Peptides Targeted to the CNS for Clearance of Protein Aggregates in Alzheimer's Disease

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OTHER INFORMATION

KEYWORDS

Alzheimers disease, anti-amyloid, beta-amyloid, peptide

CATEGORIZED AS

- **Medical**
  - Disease: Central Nervous System

RELATED CASES

2009-058-0

BACKGROUND

The majority of therapeutic programs aimed at preventing or treating neurodegenerative diseases such as Alzheimer's are focused on preventing the formation of the plaques typically composed of beta-amyloid tau-protein tangles. Although progress has been made to advance knowledge about the course of Alzheimer's disease (AD) and its etiology, treatments have yet to be developed that significantly slow or stop the disease process. Unfortunately, clinical trial failures continue to outnumber successes. While beta-amyloid aggregation remains an essential target for AD research, most work has focused on new compounds to block synthesis of beta-amyloid proteins, but unfortunately many of these promising blocking compounds have difficulty penetrating the brain-blood barrier.

TECHNOLOGY DESCRIPTION

Recognizing that beta-amyloid aggregation may be the outcome of an imbalance among the processes of protein synthesis, aggregation, and clearance, researchers at UC San Diego have developed a novel anti-amyloid therapy for AD that overcomes the limited penetration through the blood-brain barrier. Specifically, the new strategy addresses the accumulation of beta-amyloid in AD by targeting compounds to the central nervous system (CNS) that effect amyloid protein clearance. This technology offers an additional treatment option for a range of neurodegenerative diseases that are caused by an imbalance or impairment of these processes.

Specific hybrid polypeptides have been developed that can be targeted to amyloid protein in the brain. Although various types of polypeptides have been known to increase beta-amyloid clearance by a variety of mechanisms (degradation, autophagy, enzyme-based, etc.) all of these mechanisms require therapeutic delivery via direct injection into the CNS and are limited to relatively inefficient activity. Results of initial testing with the newly synthesized anti-amyloid polypeptide (cell culture and mouse model) suggest enhanced penetration of the blood-brain barrier while retaining significant activity. Additional polypeptides have been designed for synthesis and subsequent testing.

ADVANTAGES

- Direct therapeutic intervention, not immuno-therapy based.
- Highly efficient fusion polypeptide shown to reduce associated pathology.
- Peptides may be delivered peripherally; direct intra-cranial delivery is not necessary.
- Complimentary to other therapeutic strategy for Alzheimer's disease.

Left: control cells (no peptide treatment)
Right: cells treated with peptide

Left: beta-amyloid aggregates in control cells
Right: beta-amyloid aggregates after peptide treatment

INTELLECTUAL PROPERTY INFO

See published patent application, 2010/037135.

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	8,946,165	02/03/2015	2009-058

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Structure Based Design of Anti-Parkinson's Disease Compounds Targeting Synuclein Oligomerization

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