Intravenous vaccination promotes brain plasticity and prevents memory loss in Alzheimer's disease

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Alzheimer's disease (AD) is an incurable, progressive neurodegenerative disease affecting over five million people worldwide, and is the leading cause of dementia in the elderly. Currently, intravenous human immunoglobulin (IVIG) treatment is being explored in multiple off-label uses other than immunotherapy, including AD. Several clinical studies assessing the tolerability and efficacy of IVIG in Alzheimer's disease subjects are in progress with inconsistent outcomes. Recent studies conducted by Dr. Giulio Maria Pasinetti, Saunders Family Chair and Professor in Neurology and Psychiatry at Mount Sinai School of Medicine in New York, suggests that the divergent outcomes in Alzheimer's disease clinical studies of IVIG may be due to differences in temporal administration and administered dosages.

Dr. Pasinetti and his team of investigators recently found that prolonged administration of human immunoglobulin in models of Alzheimer's disease, using a dose of immunoglobulin ~5-20-fold less than equivalent doses used in Alzheimer's disease patients, is effective at attenuating Alzheimer's disease-type cognitive dysfunction while promoting synaptic plasticity. "This experimental observation provides a rational basis for rectifying the inconsistency of study outcomes in Alzheimer's disease clinical trials with IVIG," said Dr. Pasinetti. Recent evidence from Dr. Pasinetti's laboratory and others suggests that a mechanism by which IVIG may benefit cognition is through the increase of brain contents of certain mediators of natural immunity, such as the complement

component-derived anaphylatoxins C5a and C3a, capable of promoting synaptic plasticity and neuroprotection.

"We now have the much needed information supporting the potential application of slow release of immunoglobulins delivered subcutaneously to delay the onset of Alzheimer's disease, even at pre-symptomatic stages of the disease" said Dr. Pasinetti.

Dr. Pasinetti hypothesizes that the slow release of immuglobulins into the circulation and eventually into the brain for a protracted period of time may delay Alzheimer's disease dementia onset and eventually its progression through epigenetic changes in the downstream gene expression of C5a-mediated pCREB-C/EBP signaling components associated with modulation of synaptic plasticity and eventually learning and memory functions.

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