

Mount Sinai inside



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Missing Link Connects Diabetes and Alzheimer's Disease

A gene called PGC-1 α is associated with the onset of Type 2 diabetes, but it has shown to decrease in Alzheimer's disease dementia cases. The gene is a potential target for regulating glucose, according to new research led by Giulio Maria Pasinetti, MD, PhD, the Aidekman Family Professor in Neurology, and Professor of Psychiatry and Geriatrics and Adult Development. The study was recently published in *Archives of Neurology*.

Previous studies suggest that Type 2 diabetes is a risk factor for Alzheimer's disease. The relationship between the two conditions is "a fascinating new area of research," says Dr. Pasinetti.

"For the first time, we may be able to link a gene whose alteration may lead to diabetes to a mechanism that would promote conditions associated with Alzheimer's disease," he adds.

Dr. Pasinetti and his colleagues found that PGC-1 α decreased in the brains of patients with Alzheimer's disease. That decrease was associated with dementia and an accumulation in the brain of an abnormal protein known as β -amyloid. This abnormal protein causes plaque buildup in the brain, which is linked to cognitive deterioration in Alzheimer's disease.

The PGC-1 α gene, which plays an important role in regulating glucose metabolism, is considered a potential target for treating Type 2 diabetes.

Using a mouse model of Alzheimer's disease, Dr. Pasinetti and his team also found that promoting PGC-1 α content in brain cells reduces the hyperglycemic-mediated production of β -amyloid.

The findings could help researchers identify potential pharmacological treatments that might promote PGC-1 α expression in the brain cells of Alzheimer's patients. "We need to discover new therapeutic approaches for Alzheimer's disease by looking at conditions that are unfavorable for the generation of β -amyloid," says Dr. Pasinetti.

"PGC-1 α can be easily regulated in the brain in response to caloric restriction," he adds. "Our goal is to identify potential drugs that may have an effect like caloric restriction, which can control glucose regulation and maybe reduce food intake and might help prevent cognitive deterioration."

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— GIULIO MARIA PASINETTI, MD, PHD