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### GLUCOSE DEFICIT TRIGGERS TAU NEUROPATHOLOGY AND COGNITIVE IMPAIRMENTS: IMPLICATION FOR BRAIN AGING AND ALZHEIMER'S DISEASE

Several clinical investigations have highlighted a biological link between reduced brain glucose metabolism and subsequent energy deficits with dementia and Alzheimer's disease (AD) pathogenesis. Previous studies have shown that brain glucose deficits can influence amyloid beta levels in vivo but no data are available on the effect that this condition might have on tau protein and the development of tau neurofibrillary tangles, the second most important lesions in AD brains. In this paper, we investigate the effect of chronic brain glucose deficits and energy dysregulation on memory and learning, synaptic function as well as the development of tau neuropathology in a model of tauopathy. Compared with controls, glucose deprived tau transgenic mice show significant memory deficits, impaired long-term potentiation, increased tau phosphorylation and neuronal apoptosis. Our studies demonstrate that reduced glucose availability in the central nervous system promotes directly the development of memory impairments, tau neuropathology, synaptic dysfunction, and neuronal cell death. Since restoring brain glucose levels and metabolism could afford the opportunity to positively influence the entire AD phenotype, it should be considered as a viable therapeutic approach for this disease and related dementias.

#### Biography

Domenico Pratico graduated from the University of Rome "La Sapienza", School of Medicine as Medical Doctor, where he had completed a residency program in Internal Medicine. Later on he continued his post-graduation training at the University College Dublin, Ireland. Internationally known for his work on Alzheimer's disease, Pratico is a Professor of Pharmacology, Microbiology and Immunology at Temple University, School of Medicine. He has authored over 230 original articles, and has received many awards for his research accomplishments, including the Irvine H. Page Award, Neurosciences Education and Research Award, the Zenith Award from the Alzheimer's Association and the Dorothy Dillon Eweson Lectureship.

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