Dysfunction of G-Protein-Coupled Receptor Kinases in Alzheimer's Disease
(VA Reference No. 02-079)

Novel method of detecting and preventing Alzheimer's disease, particularly at prodromal and early stages

Technology
The Department of Veterans Affairs has developed a method of detecting and potentially preventing Alzheimer's disease, particularly at prodromal and early stages. The method entails detecting a disruption or alteration in normal sub-cellular distribution of G-protein receptor kinases (GRKs), particularly GRK2 and GRK5. The disruption is caused by abnormal accumulation of soluble beta-amyloid. The prevention or suppression of the disease progression at prodromal or early stages includes correction of GRK dysfunction.

Description
Prominent pathological features of Alzheimer's involve the abnormal accumulation of a small peptide, beta-amyloid (Aβ). However, the pathogenesis mechanisms associated with this abnormal accumulation remain unclear. This has significantly hampered understanding of the prognosis, prophylaxis and therapeutic regimen for AD patients. However, the VA has discovered that decreasing expression level of G-protein-coupled receptor kinases, particularly GRK5, correlate with increasing accumulation of soluble beta-amyloid. This has led to a method for detecting Alzheimer's pathogenesis that comprises measuring the content of G-protein receptor kinase 5 (GRK5) in membrane fractions from the brain of a patient and comparing the content to that of an unaffected control, wherein a decrease in membrane content of GRK5 indicates Alzheimer's pathogenesis.

Competitive Advantage
The novel technology developed opens potential new ground for the early diagnosis, prophylaxis, and therapy of AD.

This invention:

- May lead to a confirmatory diagnosis without confirmation on postmortem examination.
- May represent one of earliest pathogenic events associated with soluble Aβ.

Status
The Department of Veterans Affairs is looking for a partner for further development and commercialization of this technology through a license, and the VA inventors are available to collaborate with interested companies through a Cooperative Research and Development Agreement (CRADA).