Caffeine and Coffee as Therapeutics Against Alzheimer’s Disease

G.W. ARENDASH

The Florida Alzheimer’s Disease Research Center, Tampa,
FL USA 33613 & Department of Cell Biology, Microbiology, and Molecular Biology,
University of South Florida, Tampa, FL USA 33620

SUMMARY

These studies utilized a transgenic mouse model for Alzheimer’s Disease (AD) in well-controlled studies to determine if caffeine and/or coffee have beneficial actions to protect against or reverse AD-like cognitive impairment and AD pathology. AD mice given caffeine in their drinking water from young adulthood into older age showed protection against memory impairment and lower brain levels of the abnormal protein (β-amyloid; Aβ) thought to cause the disease. Moreover, “aged” cognitively-impaired AD mice exhibited memory restoration and lower brain β-amyloid levels following only 1-2 months of treatment. In acute studies, one oral caffeine treatment significantly reduced plasma Aβ levels. “Caffeinated” coffee provided this same beneficial effect, but not “decaffeinated” coffee, suggesting caffeine is critical to the reduction in Aβ levels. Caffeine appears to provide its disease-modifying effects through multiple mechanisms, including a direct suppression of Aβ production. These results indicate a surprising ability of moderate caffeine intake (the human equivalent of 500 mg caffeine or 5 cups of coffee per day) to protect against or treat AD in a mouse model for the disease. On the basis of these promising results, clinical trials involving caffeine and caffeinated coffee administration are in progress.