

EGCG AND VOLUNTARY EXERCISE: AN EXAMINATION OF TREATMENT EFFECTS USING THE TgCRND8 MOUSE MODEL OF ALZHEIMER'S DISEASE

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ABSTRACT

Previous work with the TgCRND8 mouse model of Alzheimer's disease has shown that voluntary exercise implemented for long time periods (5-months) and starting at very young ages (1-month), prior to the development of disease pathology, reduces cognitive impairments; however, approximately 1-month of exercise started at 80-days failed to provide cognitive improvements for male mice. Additionally, research has shown that EGCG, a botanical polyphenol, can reduce amyloid-beta levels, mitigate oxidative stress and reduce some of the cognitive impairments associated with Alzheimer's disease in the Tg2576 murine model; however, oral administration of EGCG had not been yet evaluated in the TgCRND8 strain. The present study investigated the effects of 4-months of exercise treatment, implemented at the beginning of pathology development (2-months of age), in conjunction with the effects of EGCG treatment on: 1) behavioral measures: learning and memory performance in the Barnes maze, nest building, the open-field, anxiety in the light-dark box, and 2) soluble, amyloid-beta levels in the cortex and hippocampus. Untreated Tg mice showed deficits in nest building behaviors, as well as poor spatial learning in the Barnes maze. Four-months of EGCG and exercise treatment reversed nest building and spatial learning deficits, and lowered soluble, A β 1-42 levels in the cortex and hippocampus of Tg animals. This research was supported by NIH grant funding (2P01 AG18357).