

TITLE: A Novel Rodent Model of Motor-Cognition Dual-Task Performance Deficits in Advanced Age

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RESEARCH PROJECT DESCRIPTION

The loss of independence in the elderly can manifest from impairments physical or cognitive function. Moreover, in old age, latent motor deficits can be unmasked when subjects perform a “*dual-task*”, which requires walking while using working memory. This presents a *significant problem*, as instrumental activities of daily living often necessitate simultaneous motor and cognitive functioning. Critically, a fundamental gap exists regarding the biological mechanisms that are responsible for the strong association between physical performance and cognition and why the aged brain has insufficient resources for supporting dual-task performance. While studies have examined the association between motor and cognitive systems, they have all been conducted in humans rendering invasive measures of biological mechanisms untenable. Thus, there is an *urgent need* to develop an animal model of motor-cognitive dual-task performance. The *long-term goal* of the proposed research plan is to determine the interactive mechanisms of declining physical function and cognition in order to develop therapeutic strategies that promote successful aging. This proposal will test the *central hypothesis* that a dual-task requiring animals to ambulate while performing a working memory task will produce gait anomalies in aged rats with otherwise normal gait, and that this can be ameliorated by a ketogenic diet. The *significance* of this project is that the development of an animal model of cognitive-motor interactions will vertically advance aging research by enabling investigations into the *mechanisms* of this association to promote the identification of translationally relevant interventions. This research is funded by the Claude D. Pepper Older Americans Independence Center.