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Enhancing dentate gyrus function with dietary flavanols improves cognition in older adults.

Brickman AM[1], Khan UA[1], Provenzano FA[1], Yeung LK[1], Suzuki W[2], Schroeter H[3], Wall M[4], Sloan RP[4], Small SA[5].

Author information

Abstract

The dentate gyrus (DG) is a region in the hippocampal formation whose function declines in association with human aging and is therefore considered to be a possible source of age-related memory decline. Causal evidence is needed, however, to show that DG-associated memory decline in otherwise healthy elders can be improved by interventions that enhance DG function. We addressed this issue by first using a high-resolution variant of functional magnetic resonance imaging (fMRI) to map the precise site of age-related DG dysfunction and to develop a cognitive task whose function localized to this anatomical site. Then, in a controlled randomized trial, we applied these tools to study healthy 50-69-year-old subjects who consumed either a high or low cocoa flavanol-containing diet for 3 months. A high-flavanol intervention was found to enhance DG function, as measured by fMRI and by cognitive testing. Our findings establish that DG dysfunction is a driver of age-related cognitive decline and suggest non-pharmacological means for its amelioration.