

Impact of dietary polyphenols on brain functions through the gut-brain axis modulation

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Accumulating evidence suggests that diet and lifestyle can play an important role in delaying the onset or halting the progression of age-related health disorders and to improve cognitive function. A growing number of dietary intervention studies in humans and animals and in particular those using polyphenols, have been proposed to exert a multiplicity of neuroprotective actions within the brain. Recently, tremendous progress has been made in characterising the bidirectional interactions between the central nervous system and the gastrointestinal tract. This concept of a microbiome–gut–brain axis suggests that modulation of the gut microbiota is a tractable approach for developing novel strategies for the regulation of overall brain function. Such findings argue in favour of an approach of modulating the microbiome and indirectly brain functions with dietary interventions containing defined nutrients and food bioactives designed to promote healthier ageing. Amongst those nutrients, polyphenols have been consistently reported to play a protective role against cognitive decline and have the ability to modify the microbiome composition and metabolism.

Thus, the purpose of this presentation is to provide an overview the regulation of cognitive functions by dietary polyphenols and to present some of their molecular mechanisms of action, including a potential to modulate the gut microbiota, to protect neurons against injury induced by neurotoxins, an ability to suppress neuroinflammation. Altogether, these processes act to maintain brain homeostasis and play important roles in neuronal stress adaptation and thus polyphenols might have the potential to prevent the progression of neurodegenerative pathologies.