71°

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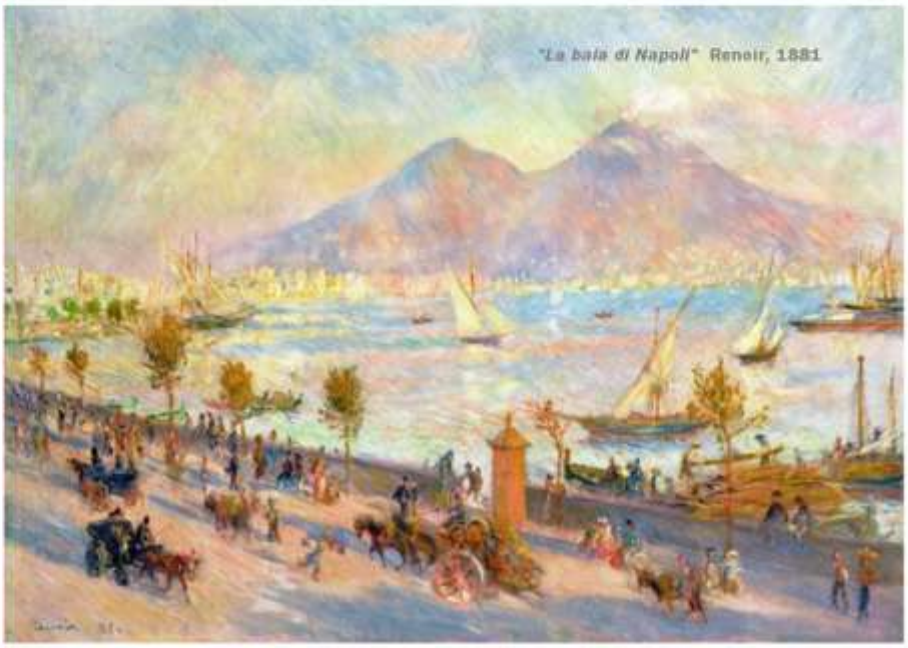

XVII Convegno SICV

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REDUCTION OF ALZHEIMER'S DISEASE BETA-AMYLOID PATHOLOGY BY MODULATING THE GUT MICROBIOTA IN A TRIPLE TRANSGENIC MOUSE MODEL

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Gut microbiota has a proven role in modulation of some neurodegenerative diseases progression suggesting the use of probiotics in preventive or therapeutic procedures (Bhattacharjee and Lukiw (2013); Wang and Kasper (2014)). In the present study, a novel probiotic formulation (SLAB51) was administered to a triple-transgenic mouse model of Alzheimer's disease (AD), named 3xTg-AD, and their respective wild types (WD). The main aims of this research were to get a better knowledge about modulation of the gut-brain axis upon administration of SLAB51 and to investigate the potential beneficial effects on memory deficits, amyloid plaques deposition, and neuronal apoptotic index. Eight weeks old male mice (n=60) were organized in a treated group (administered for 4 months with SLAB51 in water) and a control group (administered with water). Animals were tested for behavioural tests: The open field (OF), The novel object recognition (NOR) tests, The passive avoidance and The elevated plus maze test (EPM). Afterwards, animals were sacrificed and brains collected, weighted and macroscopically evaluated. Brain samples were treated for histological investigation, then stained to analyze Aβ peptides deposits using Congo red assay and immunohistochemical methods (anti Aβ1-42 peptide antibody). Behavioral tests revealed that SLAB51 exerted a beneficial effect on memory deficit in AD mice. Interestingly, the brain weight of probiotic-treated mice showed no changes whereas in control animals it was significantly decreased. Macroscopic evaluation showed a decline in the cortical thickness of untreated mice that was instead significantly reduced in treated group. In addition, ventricular dilatation observed in untreated animals, showed a decreasing upon the probiotic administration. Histological investigation revealed that SLAB51 contributes to a consistent reduction in the amount of brain Aβ. Congo red staining evidenced a significant reduction in extracellular amyloid deposits, associated with low staining of somata and processes of hippocampal pyramidal cells from Ammon's horn, or in granule cells from dentate gyrus, especially in the AD mice treated samples. Moreover, data were validated by the immunohistochemical results that showed higher amounts of amyloid deposits in the untreated mice than in control ones. This study suggests the beneficial effect of SLAB51 in counteracting brain damages typical of Alzheimer's disease.

Bhattacharjee S. and Lukiw WJ. (2013). Alzheimer's disease and the microbiome. Frontiers in cellular neuroscience 7, 153. Wang Y. and Kasper LH. (2014). The role of microbiome in central nervous system disorders. Brain, behavior and immunity 38, 1-12.