

## Abstract

Alzheimer's Disease (AD) is a neurodegenerative disease characterized by a gradual decline in memory and cognitive function. The main age category that is affected by AD is the elderly. Currently, AD is treated with cholinesterase inhibitors (CI), N-methyl-D-aspartate (NMDA) antagonists, combination therapy, and neuropsychiatric drugs. However, these treatments are not effective against AD. Environmental enrichment (EE) has the potential to become a novel treatment for AD. EE consist of augmented environment with various sensorimotor, cognitive, and social stimulation. The objective of this study is to find the effect and the possible mechanism of standardized EE treatment on cognitive function and immune response of AD mouse model. 13 males C57BL/6 knock-in mice were assigned into control group (n=7) and EE group (n=6). The EE treatment were conducted for 8 months. Standardized EE demonstrated a beneficial effect on the spatial working memory ability. This study might suggest that Standardized EE could shift the astrocytes and microglia reactivity toward anti-inflammatory and healing phenotype. This activation shift could lead to other beneficial effects against AD, such as clearance of A $\beta$  deposits, secretion of anti-inflammatory cytokines, prevention of neurodegeneration, and protection against toxic A $\beta$  deposits. This study concludes that standardized EE has the potential to be a new effective method of AD treatment.