Yanying Liu

Qingdao Huanghai University
China

Extracellular vesicles containing proteasomes from neural stem cells affect certain pathological and physiological processes in the body

Abstract:

Although the etiology of Alzheimer's disease (AD) is unclear until now, the fact that proteasome dysfunction is general in the pathogenesis of AD has attracted increasing attention from researchers in recent years. Much emerging evidence suggests that proteasomes exist both within cells and in extracellular vesicles (EVs) in body fluids. To better understand the role and significance of proteasome-containing EVs, in this study, we isolated and cultured neural stem cells (NSCs) from the brain of wild-type (WT) or APPswe/PS1dE9 AD mice and then collected EVs for structural and functional analysis. The results demonstrate significant differences in the morphology, structure, and function of NSCs and their secreted EVs derived from two different types of mice. Moreover, the proteasome activity in EVs isolated from AD NSCs culture medium was significantly lower than in WT NSCs culture medium. Consistently, when incubated MEF cells separately, compared with WT EVs, the AD EVs decreased the function of proteasomes and exacerbated cell death induced by oxidative stress. In addition, studies from animal research have also shown that mice injected with WT EVs showed improved proteasome function and increased animal survival rate following brain injury, while mice treated with AD EVs showed the opposite results. These research findings suggest that proteasome-containing EVs may reflect the physiological and pathological status of secretory cells and regulate some disease pathological processes, which will provide new insights into the pathogenesis of AD

Biography

Yanying Liu is a professor currently teaching Medical Pathogenic Microbiology and Parasitology, Immunology, and Biochemistry at the Qingdao Huanghai University in China. She received her Ph.D. in Neurobiology from the Capital Medical University (China) in 2006. In the past decade or so, she has worked as a postdoc or research staff scientist engaged in scientific research related to neuroscience at SUNY Upstate Medical University or the University of South Dakota in the USA. Dr. Liu's research is related to several areas: Alzheimer's disease, Huntington's disease, stroke, and stem cells. Her current research interests are the mechanism of the aging process, brain hypoxia, and stroke