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Therapeutic potential of human umbilical cord blood mesenchymal stem cell for Alzheimer's disease

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Human umbilical cord blood-derived msenchymal stem cell (hUCB-MSC) has been regarded as a fascinating candidate of stem cell therapy in neurodegenerative disorders such as alzheimer's disease (AD). Recently, many groups reported that mesenchymal stem cell is a robust source, not only of regeneration but also of secretion of various soluble factors for damaged or lost host cells. Since we also have been observed paracrine action of hUCB-MSC under a certain pathological condition, we tested whether hUCB-MSC provides therapeutic action against amyloid β (Aβ) neurotoxicity in vitro and in vivo. hUCB-MSC removed Aβ42 significantly through induction of neprilysin expression, Aβ degrading enzyme in microglia cells via paracrine action. We also identified paracrine factors which were secreted from hUCB-MSC to induce neprilysin in microglia. Moreover, the same result was confirmed in a transgenic mice model of AD. Based on these findings, we received a clearance from Korea Food and Drug Administration (KFDA) and are performing Phase I clinical trial in Korea. In this presentation, I will briefly introduce our efforts to develop hUCB-MSC therapeutics for AD from the bench to clinical trial.

Biography

Jong Wook Chang has completed his Ph.D in 2005 from Gwangju-Institute of Science & Technology and postdoctoral studies from Korea-Institute of Science & Technology. He is the NEUROSTEM team leader of Biomedical Research Institute in MEDIPOST Co.,Ltd, a leading group of cord blood MSC therapeutics in South Korea. He also has been worked as a project manager for phase I clinical trial for AD using hUCB-MSC. He has published more than 13 papers after 2008 in reputed journals regarding stem cells and serving as an editorial board member of World Journal of Stem cells.