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Umbilical cord blood cell therapy in an animal model of Alzheimer's disease

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A novel strategy based on targeted immune suppression using human umbilical cord blood cells may improve the pathology and cognitive decline associated with Alzheimer's disease, based on the results of a study in a mouse model of this currently untreatable neurodegenerative condition, as described in a groundbreaking report in *Stem Cells and Development.*

Following a series of low-dose infusions of human umbilical cord blood cells into mice with Alzheimer's-like disease, the amount of amyloid-ß and ß-amyloid plaques—hallmarks of Alzheimer's pathology in the brain—was markedly reduced. Amyloid-ß induces an inflammatory response in the brain associated with the interaction of CD40 and CD40L, two pro-inflammatory molecules.

Human umbilical cord blood cell therapy was associated with suppression of CD40-CD40L activity, suggesting that this therapeutic approach modulates the activity of the immune system, offering the potential to target the pathogenic inflammatory response that may contribute to a variety of degenerative conditions, including Alzheimer's disease.

Jun Tan, PhD, MD, and colleagues from USF (Tampa), Yale University (New Haven, CT), Cedars-Sinai Medical Center (Los Angeles, CA), Saneron CCEL Therapeutics (Tampa, FL), and Saitama Medical School (Japan), concluded that human umbilical cord blood cell-induced disruption of the CD40-CD40L interaction may alleviate the key

pathologic changes in the brain associated with Alzheimer's disease in a report entitled, "Peripherally administered human umbilical cord blood cells reduce parenchymal and vascular beta-amyloid deposits in Alzheimer mice."

"Previously, challenging observations have reported phenomena suggesting the non-hematologic therapeutic potential of blood stem cells. What is novel about this paper is its application to Alzheimer's disease, and a significant advance in characterizing the ameliorative mechanism of action" says Graham C. Parker, PhD, Editor-in-Chief of Stem Cells and Development, and a research professor in The Carman and Ann Adams Department of Pediatrics, Wayne State University School of Medicine, Children's Hospital of Michigan.

Source: Mary Ann Liebert, Inc./Genetic Engineering News