Uncovering How Bone Marrow Stomal Cells Can Potentially Regenerate Brain Tissue

Despite the title of their article it is good science performed with nuclear methods.

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Japanese researchers have found a piece of the "missing link" about how bone marrow stromal cells restore lost neurologic function when transplanted into animals exhibiting central nervous system disorders, according to a study in the March issue of the Journal of Nuclear Medicine.

"Our study showed that cell transplantation therapy may improve brain receptor function in patients who suffered from cerebral stroke, improving their neurological symptoms," said Satoshi Kuroda, M.D., Ph.D., who is with the department of neurosurgery at Hokkaido University School of Medicine in Sapporo, Japan. "How the transplanted bone marrow stromal cells restore the lost neurologic function is not clear," added the co-author of **"Improved Expression of Ã£-Aminobutyric Acid Receptor in Mice With Cerebral Infarct and Transplanted Bone Marrow Stromal Cells: An Autoradiographic and Histologic Analysis." !!!**

What researchers do know is that cells found in an adult's bone marrow--stromal cells--may provide a safe, ethical source for replacing brain cells lost to neurological disorders such as Alzheimer's and Parkinson's diseases. Studies have shown that cells taken from adult human bone marrow may possibly be converted into neural cells--cells with the ability to convert to any type of cell found in the body--that could then be transplanted into the brain.

Using autoradiography (a technique that uses X-ray film to visualize radioactively labeled molecules) and fluorescence immunohistochemistry (the testing of sections of tissue for specific proteins by attaching them with specific antibodies), the researchers examined the binding of a radioactive molecule with a specific receptor protein in animals with cerebral infarcts or strokes. Their findings "clearly showed" that bone marrow stromal cells "may contribute to neural tissue regeneration by migrating toward the periinfarct area and acquiring the neuron-specific receptor function," reports the JNM article.

The authors emphasized that "it is essential to clarify the underlying mechanism before undertaking clinical trials with stem cellâ€“based approaches for patients with cerebral stoke." Their results "may help fill in a piece of the 'missing link' between histologic findings and functional recovery in animal experiments and may be useful for further stem cell research." More research needs to be done "to fully clarify the mechanism of cell transplantation therapy for neurological disorders," said Kuroda. He added, "When the efficacy, mechanism and safety of cell transplantation therapy are established, we will be able to apply it to clinical situations."

Molecular imaging and nuclear medicine are useful tools that allow the visualization of different kinds of neuronal functions to evaluate cell transplantation therapy in both experimental and clinical situations, said Kuroda. "It is very difficult to visualize neuronal functions; therefore, we chose receptor imaging to assess the effects of cell transplantation therapy on cerebral stroke," he explained.