

New technology enhances therapeutic potential of cord blood stem cells

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A CD26 Inhibitor increases the efficiency and responsiveness of umbilical cord blood for bone marrow transplants and may improve care for blood cancer patients according to research from Rush University Medical Center being presented at the 6th Annual International Umbilical Cord Blood Transplantation Symposium, June 6-7 in Los Angeles.

Kent W. Christopherson II, PhD, assistant professor of medicine and researcher in the Sections of Hematology and Stem Cell Transplantation at Rush, is researching a CD26 Inhibitor, a small molecule enzyme inhibitor that enhances directional homing of stem cells to the bone marrow by increasing the responsiveness of donor stem cells to a natural homing signal. Homing is the process by which the donor stem cells find their way to the bone marrow. It is the first and essential step in stem cell transplantation.

Cord blood is increasingly being used by transplant centers as an alternative source of stem cells for the treatment of blood cancers, including myeloma, lymphoma and leukemia. The cells, which are collected from the umbilical cord after the baby is delivered and separated from the cord, are most commonly used for bone marrow transplantation when a donor from a patient's family or an unrelated donor does not produce an appropriate bone marrow match.

The current drawback to the usage of cord blood cells is that due to the limited volume and cell number, there are generally only enough cells

available from a single cord blood collection for children or very small adults. Cord blood cells also usually take longer to engraft, leaving the patient at a high risk for infection longer than donor matched transplanted marrow or peripheral blood stem cells. The goal of Christopherson's research is to increase the transplant efficiency of umbilical cord blood and ultimately make transplant safer and available to all patients who require this treatment.

In his discussion on "Strategies to Improve Homing," Christopherson states that results from his and other laboratories suggest "the beneficial effects of the CD26 Inhibitor usage and the potential of this technology to change hematopoietic stem cell transplantation."

Christopherson will co-chair the session and review some of his Leukemia & Lymphoma Society funded work at the symposium in a session entitled "Basic Science and Clinical Studies Addressing Obstacles to Successful Umbilical Cord Blood Transplants (UCBT)". He will be joined by Dr. Patrick Zweidler-McKay of the University of Texas MD Anderson Cancer Center. Zweidler-McKay will discuss his team's work in the same session on Engraftin™, a human recombinant enzyme technology that increases the efficiency of engraftment and reduces graft failure in transplantation of cord blood derived stem cells.

Research results in animal models by Christopherson and Zweidler-McKay show that both Engraftin and CD26 Inhibitor can enhance homing and rate of engraftment, which will result in reduced patient morbidity and mortality in bone marrow transplants. American Stem Cell, Inc., the developer of both technologies, plans to begin human trials in the next few months.

There are over 250,000 new cancer patients per year who require or would benefit from stem cell transplantation and as many as 20% are unable to find a blood or marrow match.

Source: Rush University Medical Center

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