BioSpectrum the business of Bio & Health Sciences

Holy grail of the future

07 March 2012 | News

Image not found or type unknown

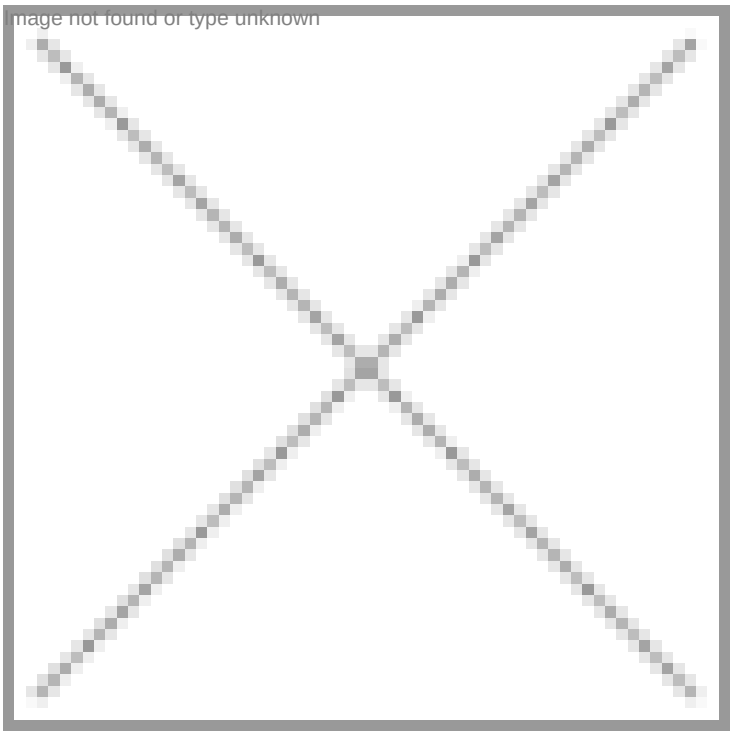


Image not found or type unknown
Cord blood cells

Manipulating the cord blood cells that have been collected during birth in order to increase their numbers is viewed by the scientific community as the way forward for the future

Genesis

In 2010, scientists at the Fred Hutchinson Cancer Research Center cleared a major technical hurdle in making umbilical cord blood transplants, a more widely-used method for treating leukemia and other blood cancers. The successful laboratory method for expanding the number of stem and progenitor cells from a single unit of cord blood resulted in an average 164-fold increase in the number of CD34+ cells, a type of hematopoietic stem cell. Such cells are multi potent and give rise to all types of blood cells.

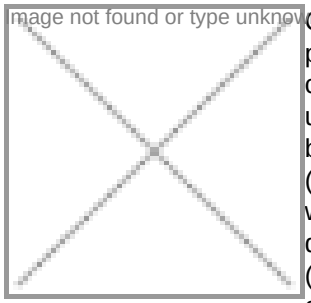
The Technology

Human cord blood stem cells that are collected and stored during birth are limited in quantity due to which patients in their lifetime can utilize these cells for limited number of times. Cord blood cell expansion technologies open up the scope for multiple use of these cells for a variety of treatments and increases the capacity of transplantation both in adults and adolescents.

The Impact

Manipulating cord blood stem cells in order to increase their numbers, will result in treatment using the patient's cord blood cells for a wide variety of diseases. Moreover, it reduces the risk of early deaths when patients opt to get treated through cord blood cell transplantation. It would also allow those families who have privately banked their cord blood stem cells to use them for multiple treatments and even potentially donate a portion of their cord blood sample to patients who are in need.

The technology of human cord blood cell expansion, wherein stem cells can divide, multiply and increase in numbers, is slated by scientists across the world as an important treatment tool of the future. Using this technology, patients can use their cord blood cells a multiple number of times for more than one treatment during their lifetime, thus improving treatment outcomes. It



Cord blood cells are stored both in public and private stem cell banks. While private banks store cord blood cells such that in the future it can be used by the same person, public banks store it based on the same human leukocyte antigens (HLA), which could be used by any needy person with the correct HLA match. Dr Samuel Abraham, director, Nichi-In Center for Regenerative Medicine (NCRM), Chennai, says, â€œIf someone needs a cord blood transfusion for some disease, the patient will have to look for a fully matching cord blood unit available with a public cord blood bank and in that case if there are 30,000 samples already stored in that particular bank, the chances of getting one fully matching unit is good.â€? Even if a matching unit is available, the quantity may be or may not be sufficient and the same unit may be needed for one or more people. Cord blood, which has 300-to-600 million cells, will be adequate for a patient with a body weight of 10-to-20 kgs. Beyond that, more than one cord blood unit of the same HLA typing is necessary. This is when expansion of a patient's cord blood cells becomes vital, especially in the Indian context.

Companies in pursuit

Globally, many research and clinical studies are underway focusing on cord blood cell expansion techniques, which is indicative of the significance this technology will hold in the future. Chennai-based Indo-Japan joint venture Nichi-In Center for Regenerative Medicine is presently conducting extensive research on the technology through in-vitro methodologies.

National Center for Cell Science, Pune, is also making progress in studies and research towards expansion of cord blood stem cells. Researchers here have used anti-apoptotic agents as supplements in media for in vitro expansion and cryo preservation of expanded CD34+ cells and see that they reduce apoptosis and enhance expansion. It is predicted that this technology will open new doors for diseases such as leukemia.

Nayantara Som in Mumbai