

## **Banking on Cord Blood in Asia**

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It is well known that stem cell research has sparked numerous debates because of the ethical issues surrounding one particular type of stem cells, the embryonic stem cells, which are found naturally in the early stages of embryonic development. Since stem cells from cord blood are non-controversial and do not involve using cells from aborted fetuses, this has surfaced as an attractive source of stem cells for research and clinical applications.

Cord blood, sometimes called placenta blood or umbilical cord blood, is the blood that remains in the umbilical cord and placenta following birth. The umbilical cord and placenta are normally discarded after birth, as medical waste before researchers discovered that stem cells present in them might be a key component in regenerative medicine. Like embryos, cord blood contains primitive stem cells that give rise to the blood and immune system, and are also capable of differentiating into other tissues.

### **Cord Blood Banks Blossom in Asia**

Recent research into the potential of cord blood stem cells for regenerative therapies has encouraged the mushrooming of cord blood banks in the Asian region. Besides developed countries like Japan and Singapore, other countries such as China, Vietnam, South Korea, Malaysia, India and Taiwan also boast their own cord blood banks. Though most of these programs are government-funded, there are also a number of private cord blood banks present, such as CordLife Private Limited in Singapore. Established in the year 2000, CordLife is Singapore's own homegrown start-up company, conducting research in regenerative medicine and stem cell technology, with autologous (self-use) private cord blood banking services. Among other notable institutions, there is also the Reliance Life Sciences Private Limited, India, which was incorporated in January 2001, and has established a cell biology research center in Mumbai. This center is the first of its kind in Asia. It has been listed by the National Institute of Health, U.S.A., as one of the ten companies and research institutions working in the area of embryonic stem cells and eligible for federal research funds under the new U.S. presidential guidelines. The cell biology center is focused on research and development in stem cells and tissue engineering. They are also creating one of the largest cord blood repositories in the world, as part of the cell biology center. The repository would cryopreserve stem cell-enriched cord blood at -196 degrees centigrade in a computer-controlled robotics-based bioarchive system. They also plan to offer services in expansion and storage of stem cells from peripheral blood stem cells for patients who are to undergo aggressive chemotherapy.

### **Potential**

Currently, cord blood transplants are being used for treatment of diseases including leukemia, breast and other cancers, blood disorders, metabolic disorders, immuno-deficiency ailments, and auto-immune diseases. With the current pace of technology advancement, new treatment options are being made available. There is even scientific evidence that suggests that an individual's own hematopoietic stem cells from cord blood could be used when he or she reaches middle age, with the intent to boost the immune system and prevent potentially life-threatening diseases in the future.

### **Restraints**

Though the collection of umbilical cord blood is painless, fast, and risk-free for both the mother and baby, the cost for autologous private banking can be quite high. In Singapore, for instance, the collection and processing charges, which are a one time fee, can range between \$1,400 to \$2,500 in addition to the recurring storage charges, which can be around \$150 annually. These include services such as testing for infectious diseases, contamination, and typing. Public banks have the benefit of no collection or storage charge, however, the cord blood would be owned by and its availability would be dependent on the bank. Since the

Government funds the banks, the amount of cord blood that can be stored at any one time depends on the funds available. Because of the far-reaching potential for future treatments using cord blood, especially for families (with a history of leukemia and other diseases) that may have higher chances of requiring cord blood, the Government should consider providing insurance reimbursements to such people to use private banking.

### **Success Stories to Come**

Last August, in what is believed to be the world's first, doctors at the Singapore General Hospital successfully transplanted cells from a baby's umbilical cord to a young boy suffering from a chronic blood disorder, thalassemia - a disease that causes chronic anemia and kills most sufferers before they reach primary school and affects thousands of children in Southeast Asia. The operation was done using bone marrow cells taken from a new-born baby's umbilical cord collected three years ago and found to be a good match for the patient. This negates the need for siblings to donate bone marrow, as has happened in the past. This gives new hope to sufferers of thalassemia who can't find a donor match with close relatives.

### **Just the Beginning**

As Asians become more aware of the benefits of preserving their cord blood for future treatment purposes, the demand for cord blood banking will definitely increase. With public banks being constrained by fund issues, this poses a great opportunity for growth of private banking services, which when coupled research institutions involved in regenerative medicines and other potential applications, could provide an avenue for further research and development of stem cell technology in Asia.

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