

## **Test Tube Mummies**

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Are cryogenics and test tube human really just ideas for Hollywood blockbusters? Not to some mothers who are turning to Life Sciences to give their children and the families an extra gift of life. Tracy Lee reports.

What are modern mums talking about these days? Montessori versus PAP kindergartens? Whether infant massage ensures better sleep for kids, and therefore, the parents too? Which educational CD-Roms to buy? The benefits of playing Mozart to your pregnant stomachs?

### **Nah, That's Old Hat**

Welcome to the changing face of motherhood, where the act of bringing up baby has become almost anything but a natural process. These days, is there anything the rigorous disciplines of Science and Technology cannot achieve in terms of ensuring healthy offspring, as compared to the often erratic and unpredictable forces of Mama Nature?

Forget about waiting impatiently for nine long months for baby to be born in order to check if he has all 10 of his cute little fingers and toes, or to argue over whether he looks more like dad or mum – just drop in to Raffles Hospital.

For \$100 a pop, an ultra-sophisticated ultrasound machine will take a 3-D, full color snapshot of unsuspecting baby floating innocently in his own little world. Hopefully he's smiling and the umbilical cord isn't blocking his face. In fact, public sector hospitals like Singapore General Hospital, National University Hospital and Kandang Kerbau Hospital also have these \$200,000 machines which are used in routine scanning to check for hare lips and other deformities. And you get to keep the pictures for free.

Soon, you'll even be able to see Junior live in action, doing somersaults, kicking Mummy in the stomach or sucking his thumb, when some hospitals here introduce ultrasound video machines.

But snapshots for the family album of baby in-utero are just the more 'frivolous' side of things.

Now, it seems, the ability to give the gift of life is good, but the ability to provide your progeny with a second lease of life in the face of a fatal illness, is even better.

### **Birthday Cord**

A woman is in the hospital delivery room, about to give birth.

The ob-gyn and the nurses are all in place, ready to perform their well-rehearsed parts in operating theatre. A new cast member stands unobtrusively in the wing. Outside, a courier awaits.

Soon, the cry of a newborn infant fills the air.

While the hospital crew busy themselves making sure the umbilical cord is cut and baby is washed and wrapped and placed in mummy's arm, and while mummy coos a welcome to this new being, this new cast member, a phlebotomist (an expert who specializes in drawing of blood) whips out a syringes and extracts a vial of blood from the still pulsating umbilical cord and placenta that have been the baby's lifeline for the past nine months. Within minutes, he passed it to the courier waiting outside, who then rushes off to the airport.

Even before Mummy begins breastfeeding baby for the first time, the blood sample has already boarded the next flight out to a lab in the United States, where it will be labeled, tested for infectious diseases and contamination, process, treated with anti-freeze, and stored in liquid nitrogen.

While all this might sound like the stuff of the latest James Bond or even Austin Powers movie, it is not. It is for real, and looks set to change the face of medicine and parenting for good.

### **Science non-fiction**

What's the big fuss over the "afterbirth", as the placenta and umbilical cord are called, which has, traditionally, been treated as medical waste and disposed of in sealed biohazard containers?

Well, the blood drawn from the umbilical cord contains what's pretty much the buzzword of the moment: stem cells.

Like the "Joker" in a deck of cards (Jokers can be used to represent any card that you need in order to win the game), stem cells are "master cells" that can transform themselves into any of the 200-odd different types of cells found in the human body – anything from brain to skin to muscle to bone marrow to heart tissue.

Hailed as the newest "Holy Grail" of medicine, they're touted to be the cure-all for a wide range of afflictions, as they can potentially be used to replace human cells that have been damaged by injury or disease.

"Most recently, trials using stem cells as a follow-up treatment for chemotherapy have been conducted (for breast, kidney and ovarian cancer). In addition, researchers are now putting great emphasis on converting these stem cells into liver cells, heart cells, insulin-producing cells (to treat diabetes) and neuro cells (to treat Alzheimer's, Parkinson's and similar neuro-degenerative diseases)," confirms Soren Basted, a biotechnologist who works in the private sector.

Stem Cells have also shown promise in treating other conditions like leukaemia, arthritis, burns, spinal cord injuries...the possibilities, at this point, seem endless.

Furthermore, the advantage of using stem cells for therapeutic purposes is that they appear to have an "Access All Areas" pass that someone else's donated heart or bone marrow doesn't, so there is lower risk of complications or death arising from the host body rejecting a "foreign" organ or tissue after the transplant has taken place.

Add to that the fact that a baby's blood has never been exposed to any horrible environmental pollutants, bacteria or viruses that some anonymous donor might have, is of course an added advantage.

### **The New Health "Insurance"**

Before you rush out asking "Great, where can I buy some of those stem cells for my darlings?", the answer is, you cannot, because they are not for sale.

There is a public cord blood bank in Singapore at the Center for Transfusion Medicine which stores cord blood samples obtained through the signed consent of new mothers who've delivered at participating hospitals like Thomson Medical Center, Mount Elizabeth Hospital and National University Hospital.

Jointly set up by the Singapore General Hospital's Department of Haematology, the World Health Organisation Collaboration Center in Immunology at the NUS, and the Bone Marrow Donor Program in 1997, the public bank has cord blood samples available for searches conducted by any physicians for the purpose of finding a suitable match for stem cell transplants.

"After all, cord blood should be made available to everyone who needs it, regardless of his or her financial needs," reads the press statement from the SGH Department of Haematology.

So far, a total of eight transplants have been performed using the bank's reserves.

On 19 February this year, the papers reported that Singapore doctors had scored a world first by curing a 43-year-old man of cancer using cord blood from two babies - one sample came from Singapore (cost: \$1500) and the other had to be flown in from the U.S. (that one cost \$36,500!). "SGH had to turn to the US because the cord-blood bank here, which has only 1,000 samples, could only find one close match." reported The Straits Times.

### **Private Time**

Given that around 50,000 babies are delivered in Singapore each year but only 1,000 new mothers have donated their babies' cord blood since the public cord blood bank opened in 1997, what that means for you, a member of the public, is that you may not be able to get what you want, when you want it. Not a good thing when it's a matter of life or death.

That brings us to the issue of private cord blood banking - if you're having a baby anytime soon and have an extra few thousand dollars to spare (S\$2,500 for the processing plus an additional \$250 a year for storage), you can make use of the services of a private cord blood bank to extract your baby's stem cells from its umbilical cord and then store it for the exclusive use of your family members.

Should the need for some kind of stem cell transplant arise sometime in future, then "Junior's cord blood, vintage 2002" can be thawed out in a hurry, at your disposal.

After all, blood is thicker than water, so why not freeze first, worry later?

So far, there is only one private cord blood bank in Singapore, set up April 2001. But the stringent regulations against any form of advertising by the medical industry here have not prevented more than 60 clients from engaging its services within the first year of operation.

"Typical clients tend to be more educated, who can appreciate how storing cord blood stem cells could one day save their child's or another family member's life," says Steven Fang, CEO and founder of CordLife.

The 36-year-old father of three had been working in the pharmaceutical, medical and healthcare industry for 14 years, but decided to set up the private cord blood bank after a close friend in the US discovered that his first child had leukaemia, which required a bone marrow transplant. Unfortunately, the chances of finding a bone marrow match are one in 20,000.

"They tried to seek help from bone marrow transplant banks but were told that the search was likely to take over a year. Then they heard also about how umbilical cord blood could also be used, and also undertook a search with a public cord blood bank.

"After six months, it seemed the only option left was to explore the possibility of using the cord blood from their second baby (since his wife was pregnant at the same time), and within days of the birth of their second child, their first child received a cord blood transplantation and is today, alive and well.

"It all felt too close to home and I decided to start a venture that would not just help my children, but all concerned parents in Asia," Steven concludes. For the record, he recently had his third child, and had its cord blood frozen and stored at his own facility in a medical center along Orchard Road.

### **Family Ties**

Amy Chow and her husband, both 30-something professionals, are a good example of these concerned parents.

Their roomy house off Upper Bukit Timah Road has a meticulously trimmed front with lawn

with a swing that fits four, and a fish pond that makes soothing gurgles. In the driveway is parked a silver MPV which is a little big for the couple, the two tiny tots and their maid right now. But one day, it will be a perfect fit when the two other children they plan to have come along.

In the living room are framed pictures of family vacations, and the wall near the kids' toy corner and crib are decorated with huge Winnie The Pooh stickers.

But beneath this postcard-perfect portrait of family bliss lies an undercurrent of worry. Thirty-three-year old Amy, who just gave birth to her second son Zethus last December (older boy Aeacus turns three this month), has a family history of cancer and blood-related disorders.

"My mum passed away from multiple myeloma (something to do with insufficient red blood cells), and another close relative died of lymphoma. What's more, several of my older relatives are now battling one form or other of cancer. That means that my kids might be at risk for all this," says the IT specialist.

In Zethu's case, the cord that kept him alive during the nine months he spent in his mother's womb might turn out to be his lifeline the second time round, years down the road. Who knows, it might even save his brother Aeacu's life, or even his parents'.

Does Amy think she's being, in typical Singaporean manner, plain kiasu?

"I'll do whatever it takes, and this brings me peace of mind," she states emphatically.

In fact, she even goes as far as to say that should the day come when it's possible to use genetic manipulation to have a "designer baby", she would be first in line. "But only as far as it involves ensuring my kids are healthy and not prone to disease," she says.

"I won't go to the extent of choosing what they look like or whether they'll be good athletes or ballet dancers or whatever," she qualifies. "Growing up should be a process of learning, of acquiring skills, of developing personality and character traits. There's something that's been said about snails or tortoises...you can't break them out of their shells, you must wait for them to come out on their own. The same, I believe, applies to the human child and its potential to develop into an adult. You must still have to leave some things to Mother Nature."

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