Year 2003 - Seven Issue. Mita (P) 119/11/2002 • A Newsletter from CordLife

# THE GUARDIAN

## CordLife CEO Receives Spirit of Enterprise Award


CordLife's CEO, Steven Fang, is a recipient of the Spirit of Enterprise Award. The award was presented by Mr. Raymond Lim, Minister of State for Trade & Industry and Foreign Affairs, in a ceremony at the Asian Civilisations Museum on 10th September. This is the inaugural year for this award.

Altogether, 152 of the country's up and coming entrepreneurs were selected. The companies must be expanding small- and medium-sized enterprises, and must not have the government as their principal shareholder. These entrepreneurs were then interviewed and their stories posted on the SOE Organisation's website. 38 nominees were selected by public vote to receive the award. Over 36,000 votes were recorded.

"The award is recognition of the great work of the CordLife team," said Mr. Fang. "In just over two short years, this team of very dedicated, very talented, and very hardworking people, has built a company that is fast becoming a recognized player in the global stem cell biotechnology industry. This award is accepted with great gratitude, on behalf of the people who have made this company what it is."

# Jeremy Speaks...

It has been an interesting and challenging few months for CordLife. To meet the needs of this growing company, I am happy to inform you that CordLife has taking up residence at a new location. Parkview Square now houses CordLife's corporate functions such as finance, business development, and the people involved in bringing the company global. Do come and visit us at #12-09/10!

Our existing facilities at Camden Medical Centre will contain an expanded laboratory team and counseling rooms to better meet the needs of expectant parents. In the near future, we are looking to expanding our processing and storage facilities, possibly at Camden as well.

I am also very pleased to announce that CordLife has entered into a partnership with Thomson Medical Centre. As one of the leading medical centres specialising in pediatric care, our partnership is a natural one, enabling us to aid to each other's efforts in providing add value to our customers. Using our relationship with TMC as one model, in time, we will extend partnerships to other hospitals and medical centers, both in Singapore and across the region.

The number of public talks has increased in the past few months. Apart from our regular sessions at Camden Medical Centre on the first Saturday and the third Wednesday of every month, we have holding similar talks at other venues. Our goal is to ensure every expectant parent knows about stem cells, and that the option of cord blood banking is one that is available to them.

As we move forward into 2004, the CordLife team looks forward to being of continued service to you.

*Jeremy Yee*
*Chief Operating Officer*

# Banking On Cells –

## An Introduction to Stem Cells

Due to the increasing interest in stem cells and umbilical cord blood banking, CordLife has increased the frequency of its educational talks. During these talks, trained scientists will explain more on stem cells, their applications and the latest developments in this promising area.

Do contact Grace to let us know you'll be joining us. Call us at 6238 0808, or email us at gchan@cordlife.com

The schedule of upcoming talks is:

| | Saturdays | Wednesdays |
|---|---|---|
| Date | 6 Dec<br>10 Jan<br>7 Feb<br>6 Mar | 17 Dec<br>-<br>18 Feb<br>17 Mar |
| Time | 10.30am – 12 noon | 6.30pm – 8 pm |

If you have a friend who maybe interested in CordLife services, we would be more than happy to see them, please contact us at referafriend@cordlife.com

Should you wish to be removed from The Guardian mail distribution list, or to inform us of any change in contact address, please contact Grace (gchan@cordlife.com).

# Stem Cells: Body, Heal Thyself

Stem cells are special cells that can be found in different parts of the human body. When an injury occurs, these cells spring into action, dividing to become new cells to replace damaged cells. The more scientists understand these cells and what they can do, the more we are discovering that these cells can play a large part in a wide range of medical therapies.

The "traditional" sources of stem cells today are from the bone marrow and peripheral or circulating blood. Newer sources such as stem cells collected from the umbilical cord of babies immediately after birth, are increasingly being utilized. These stem cells are haematopoietic or blood stem cells (HSCs). These HSCs generate all the cells of the blood and immune system – the white blood cells (fight infection), the red blood cells (carry oxygen), and the platelets (clot wounds). A lot of research and clinical effort around the world are concentrated on HSCs.

HSCs are used in transplant medicine to regenerate a patient's bone marrow and hence they have the ability to generate red blood cells, platelets and immune cells. A HSC transplant may be necessary when a patient's bone marrow has been damaged by disease or by a high dose of chemotherapy.

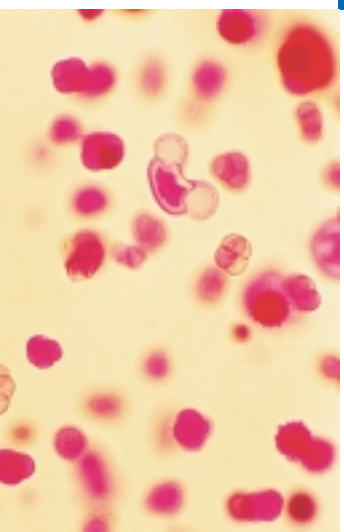
The National Marrow Donor Program of the US is considered one of the leading organizations in the world in facilitating such transplants. It lists 72 diseases that can today be treated by such transplants, such as leukemia, some forms of anemia, myeloma, and Hodgkin's Disease. In the future, some scientists believe stem cells can be used to help treat heart disease, diabetes, Alzheimer's Disease and Parkinson's Disease.

In recent years, the collection and use of umbilical cord blood for HSC transplants has been gaining popularity:

- Collecting umbilical cord blood (UCB) poses no risk to mother or child, whereas a bone marrow donor must undergo anesthesia and is exposed to a possible risk of infection.
- Collecting bone marrow is a painful and invasive process. Collecting UCB is painless to mother and child, involves only inserting a needle into the umbilical cord, and is usually over in a few minutes.
- UCB can be stored in cryogenic freezers, ready for use as soon as it is needed. Bone marrow is collected only when needed, it may take many weeks or even months to find a suitable and willing donor.
- In the case of an autologous (donor and recipient are the same person) transplant, there is of course a perfect match.
- As the stem cells in cord blood are more primitive than those in bone marrow, they carry much lower incidence of Graft versus Host Disease (GvHD), or when the graft fights the body. There's also a lower chance of the body rejecting the transplant. This makes it possible to perform transplants with less than a perfect match. UCB may therefore be used more readily.
- It is believed the "clock is stopped" for UCB in cryogenic storage, ie, protected from damage due to environmental factors, age and viral or bacterial attack. Bone marrow would be as "aged" and "damaged" as the donor.

The path ahead is a new one. Instead of using massive courses of drugs, stem cell-based therapies hold out the promise of treatments for a wide range of ailments, by using the bounty contained within the human body. Body – with a little help from medical science – heal thyself.

# Peripheral
## Blood Stem Cells



In February, CordLife received Ministry of Health approval to provide banking for peripheral blood stem cells (PBSC). Peripheral blood refers to the blood that is circulating within the body. But why take stem cells from peripheral blood? PBSC is a relatively new technique. For older people, the only other source of collecting stem cells is from the bone marrow, a very painful and invasive process.

For certain types of cancers, a high dose of chemotherapy or radiation therapy is an appropriate treatment and potentially a cure. This high dose will however severely damage or destroy the cells in the patient's bone marrow. Without these cells, the patient will be unable to carry oxygen within his body, defend against infection, or prevent bleeding. Creating these cells is the job of blood stem cells.

The amount of stem cells in peripheral blood is usually very low. To make collecting stem cells effective, the patient first needs to be injected with a special drug. The patient is then monitored to make sure that enough stem cells are present in his blood. About four to five days' later, the patient is ready for the next step, called apheresis. Blood is drawn from the patient in a similar fashion to a blood donation. A machine separates the needed cells from the blood, and returns the remainder back into the patient. An anticoagulant is also slowly added to prevent the blood from clotting. Each collection usually takes between two to five hours.

CordLife has begun working with some doctors to offer this service to cancer patients in remission. For these patients, where treatment of their cancer will require a replacement of the stem cells in their bone marrow, there is now another way of getting the stem cells they need.

# CordLife Goes to Washington

The Biotechnology Industry Organization Exhibition 2003 took place from 22nd to 25th June in Washington, achieving record attendance and international media coverage. The keynote speech was delivered by US President Bush, and an unprecedented number of government leaders also attended.

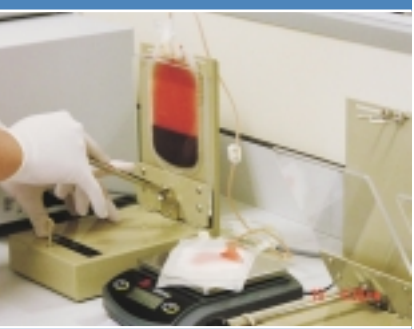
More than 16,000 attendees from 55 countries took part in the four-day conference, which included more than 1,000 speakers discussing business development, science and regulatory affairs, global health, bioethics and patient advocacy. The exhibit hall featured more than 1,000 exhibits from 55 countries.

Among these was CordLife, with its presence both in the national pavilions of Singapore and Switzerland, probably the only two-year old company to be represented at two booths from two continents. Industry professionals, investors and media representatives visiting CordLife's booth were particularly impressed by the enlarged portfolio of cellular banking services and the Cytomatrix three-dimensional cell growth platform.

BIO 2003 saw the preliminary introduction of a new line of ready-to-use, polystyrene, single-use spinner systems – a first in the market, which stimulated great interest among researchers and industry manufacturers. The range of spinner systems comprises of the Starwheel System which uses the Cytomatrix platform for high density adherent cell growth and the Paddle System. The systems will be sold through appointed distributors and partners in Asia-Pacific, Europe and the US when it officially launches in the 4th quarter of 2003.

# Umbilical Cord Blood Collection and Processing

When an umbilical cord blood (UCB) unit is used in a transplant, it is very important for the patient's survival that the blood be free of bacteria and fungi. It is therefore critical that the risk of contamination during the blood's collection and processing be minimized.



## Collection of UCB

Today UCB is collected using either a blood bag or needle and syringe. Both of these methods have vastly different contamination rates. In the largest study to date, collection by needle and syringe was found to result in a contamination rate of 12.5%, whereas collection by blood bag reduced the risk of contamination to 3.3%[1]. Contamination rates in blood bag collection can be further reduced to below 1% through adequate training of collection staff[2]. Furthermore, Bertolini et al showed that no significant difference in UCB volume could be observed when open and closed system were used, respectively[1].

To prevent coagulation of the UCB, an anti-coagulant must be added at the point of collection. Collection by needle and syringe requires the use of the bovine (cow) or porcine (pig) mucous derived anti-coagulant, Heparin.

Generally, using heparin as an anticoagulant is not advised[3].

The higher volume available in blood bag collection allows for the use of a salt / sugar solution. The risks associated with using animal-derived products can therefore be omitted by using blood bags.

[1] *Bertolini et al; "Comparative study of different procedures for the collection and banking of umbilical cord blood"; J Hematother, 1995 Feb; 4(1); 29-36.*
[2] *Armitage, S; in "Cord Blood Characteristics"; Cohan, SBA et al, Martin Dunitz Ltd, 2000.*
[3] *Beutler et al; "Interference of heparin with the polymerase chain reaction"; Biotechniques; 1990; 9; 166-71.*

## Processing of UCB

It is recommended to transport UCB units to the laboratory for processing immediately after collection, to prevent sample mix-up and to avoid potential exposure to adverse environmental conditions. Processing of UCB generally includes the removal of red blood cells (RBC) and plasma. This RBC depletion can be carried out either in an open system, or a closed system. The open system involves open transfer of the UCB cells between processing tubes, and final transfer to cryogenic vials. In contrast, the closed triple-bag system, developed by the New York Cord Blood Bank, allows processing and transfer of the UCB from the collection bag to the storage pouch in a fully closed system, hereby greatly reducing the risk of contamination and mix-up of samples.

## Administration of UCB

A UCB transplant requires that the UCB stem cells be thawed from its storage at -196°C and transfused into the vein of the recipient. In the case of open system processing and storage, the procedure involves thawing and extraction of stem cells from multiple cryogenic vials. This represents a third avenue for introduction of contamination. In contrast, stem cells stored in the cryogenic pouch of the triple-bag system can be extracted and administered using the closed Cell Wash / Infusion set.

The triple bag system enables a completely closed path (effectively from a vein in the umbilical cord to a vein in the patient), from collection, through processing and storage, to its final use in transplant.

# Public Outreach


CordLife has been busy getting the word out on what are stem cells and cord blood banking. We've spoken to students, parents, and doctors.

As part of our new partnership with Thomson Medical Centre, CordLife has become a regular participant in TMC's antenatal talks, held at Singapore Chinese Girls' School. In collaboration with East Shore Hospital, we have also held a talk there at the end of August. Nearly 40 couples came for the session.

In July, Thailand held its First National Forum of Continuing Medical Education. One of the companies invited to update doctors on the latest medical developments was CordLife. Back in Singapore, CordLife presented to oncologists, at the National University Hospital in June.

In August, CordLife spoke to the students at Hwa Chong Junior College. In September, CordLife was invited to take part in Biotech Fair 2003, at the Singapore Science Centre. CordLife made a presentation to the budding scientists, and took part in a two day exhibition for the public.

# Choosing the Right Formula for Your Baby

As recommended by the American Academy of Pediatrics and the World Health Organization breast milk remains the ideal form of infant nutrition. However, today's formulas provide a good alternative with sufficient nutrients (vitamins and minerals) and food energy (calories) for the growth of your baby.

In an attempt to develop a fat blend that works more like breast milk, most formulas now contain mixtures of coconut, soy, safflower and palm olein oil. There have however been growing concerns over palm olein oil. Studies in the US reveal that infant formulas containing high percentage of palm olein oil are not well absorbed by babies. Research has also shown that babies have lower calcium and fat absorption, compared to those fed formulas without palm olein oil.

These studies also show that babies fed formulas without palm olein oil had significantly stronger bones. Stool consistency is also similar to breastfed infants. The unabsorbed palmitic acid from palm olein oil reacts with calcium and forms insoluble compounds causing harder stool and leading to constipation.

Do check content labels as a means to choosing the right formula for your baby. With little care and caution, you can protect your baby from the adverse effects of palm olein oil.

*Article contributed by Abbott Laboratories. Their baby's formula Similac Excellence contains no palm olein oil. To find out more, you can call their Pediatric Nutrition Hotline: 6278 6220.*

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## About CordLife

CordLife Pte Ltd is a leading stem cell biotechnology company. It operates American Association of Blood Banks (AABB) compliant umbilical cord blood and peripheral blood stem cell banking facilities in Singapore, Malaysia and China. From its Singapore headquarters, and from its Cytomatrix R&D Division in Boston USA, the company engages in cutting edge adult stem cell research in conjunction with leading institutions.

One of the company's core technologies is a unique cell growth platform called, "The Cytomatrix®", a platform that enables cells to grow in three dimensions. Utilizing this platform, the company is working on stem cell expansion, and provides R&D products to researchers around the world. For further information, please visit www.cordlife.com, or www.cytomatrix.com.

## Contact Us!

Should you wish to contribute any articles, comments or pictures to The Guardian, please contact our editor, Ronald Hee at rhee@cordlife.com


Corporate Office
Parkview Square
600, North Bridge Road #12-09/10
Singapore 188778
Main line: 6238 0808
Fax: 6295 1108 Support line: 6238 1828

CordLife Pte Ltd
1 Orchard Boulevard
#08-08 Camden Medical Centre
Singapore 248649
Main line: 6238 0820
Fax: 6238 1108

Main Line: (65) 6238 0808 Fax: (65) 6238 1108
www.cordlife.com
Email: Info@cordlife.com
Clients/Doctors Support Line: (65) 6238 1828



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