

7. INDUSTRY OVERVIEW AND FUTURE PLANS, STRATEGIES AND OUTLOOK

7.1 OVERVIEW OF THE MALAYSIAN ECONOMY

Malaysia is transforming itself from an economy whose livelihood relied primarily on the production of minerals and agricultural commodities such as palm oil, natural rubber, tropical timber and other minor mineral and agricultural products into an economy dominated by manufacturing and services.

Malaysia has a population of 24 million; with an average per-capita annual income of RM17,221, an average of almost RM1,435 a month, is one of the most developed nations in South East Asia. In 2005, approximately 61% of Malaysia's population made up the middle and upper income group of the population; this means that the adoption of stem cell banking has a large market potential as the average Malaysian is able to afford it.

Birth rates are a direct determinant of a stem cell bank's yearly market potential. The birth rate in Malaysia is slowly falling but this trend is considered normal for a developing country. In 2005, the average number of children per family is 3.1, which remains unchanged from 2004. Better family planning is being exercised by the general population hence parents with fixed incomes are better able to provide for a small family rather than a large family. Parents with fewer children will be able to provide for better education and biological insurance such as UCBSC Banking.

Birth Rate 2000-2005 (Per 1000 population)

Year	2000	2001	2002	2003	2004	2005
Birth Rate	25.3	24.8	24.2	23.7	23.4	23.1

(Source: Decision Support Database, Frost & Sullivan)

The Malaysian economy is projected to grow at an average rate of 6.9% p.a. with price stability. This growth will be supported by domestic demand with strong private investment and consumption. Per capita gross national product in term of purchasing power parity is expected to increase to USD13,878 in 2010.

The services sector is expected to sustain its growth momentum at an average rate of 6.5% p.a. during the Ninth Malaysia Plan period. The growth will be derived from the finance, insurance, real estate and business services as well as the wholesale and retail trade, hotels and restaurants subsectors.

Private consumption is targeted to grow at an average rate of 6.0% p.a., higher than the growth achieved during the Eighth Malaysia Plan period. The expansion is due to the increase in disposable income and the continued improvement in consumer confidence underpinned by sustained employment growth and favourable commodity prices. In line with this projection, per capita private consumption is expected to increase at an average rate of 7.8% p.a. from RM8,071 in 2005 to RM11,753 in 2010. The share of private consumption to GDP is expected to increase to 52.1% in 2010.

(Source: Ninth Malaysia Plan)

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7.2 OVERVIEW OF HEALTHCARE IN MALAYSIA

National healthcare expenditure accounted for 3.5% of GDP in 2005. Trends in the last five (5) years show that healthcare expenditure has increased steadily, and is expected to increase further in years to come. Increased funds dedicated towards healthcare will have positive effects on the stem cell banking industry as it will allow more Malaysians to have higher accessibility to better healthcare facilities as well as allow physicians to be better trained and aware of stem cell technologies.

Healthcare Expenditure as % of GDP

Year	2001	2002	2003	2004	2005
% of GDP	2.9	3.0	3.2	3.3	3.5

(Source: Frost & Sullivan)

Per Capita Healthcare Expenditure 2000-2005 (RM)

Year	RM	% Change
2000	375	-
2001	414	10.3
2002	458	10.6
2003	504	10.1
2004	555	9.9
2005	613	10.4

(Source: Decision Support Database, Frost & Sullivan)

The above trends show that Malaysians have been increasing their spending on healthcare year on year since 2000. This indicates an increasing level of health consciousness and thus a higher willingness to spend on healthcare products and services such as stem cell banking.

Private Healthcare Expenditure vs. Public Healthcare Expenditure 2000-2005 (RM Billion)

Year	2000		2001		2002		2003		2004		2005	
Private	3.39	41%	3.77	40%	4.52	41%	5.28	41%	6.03	47%	6.97	41%
Public	4.90	59%	5.70	60%	6.62	59%	7.60	59%	8.67	53%	9.85	59%
TOTAL	8.29	100%	9.47	100%	11.14	100%	12.88	100%	14.70	100%	16.82	100%

(Source: Decision Support Database, Frost & Sullivan)

The figure above shows that combined private and government healthcare spending has more than doubled since 2000. Private healthcare spending has increased steadily over the past five (5) years and is expected to continue growing. The largest potential target market of stem cell banking is the private market; hence growing private healthcare expenditure will be a major driver for the growth of the stem cell banking industry.

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The healthcare scenario in Malaysia has seen considerable improvement since 2000. To continue the improving trend, the Government has prioritised healthcare and biotechnology as key areas of development as per the Ninth Malaysia Plan. RM10.28 billion has been allocated for the healthcare sector development during the Ninth Malaysia Plan period of 2006 to 2010. The Plan says, "Recognising the potential of revolutionising therapy in the form of cell replacement, stem cell research will be given greater priority," and it is expected to have a positive impact on the stem cell banking industry.

(Source: Frost & Sullivan)

The Government will continue to provide facilities and implement programmes to improve the health status of the population, especially at the primary care level. Existing facilities will be upgraded while new facilities will be built to provide a comprehensive package of services. The Government will also promote the concept of lifelong wellness and a proactive approach to maintain health through awareness-raising initiatives.

In terms of health tourism, intensive marketing and promotional activities continued to be undertaken to position Malaysia as a premier destination for quality healthcare aided by greater involvement of the private health sector. In addition, private providers will be encouraged to give greater emphasis to disease prevention and the promotion of a healthy lifestyle.

(Source: Ninth Malaysia Plan)

7.3 OVERVIEW OF THE STEM CELL BANKING INDUSTRY

Stem cells are undifferentiated cells that are responsible for forming different cell types in the human body. After decades of research, scientists are beginning to understand the precise conditions and molecular factors that are required to control stem cell differentiation into specific cell types. This has paved the way for regenerative medicine to use stem cells to replace or regenerate damaged tissues. The theory states that, if stem cells can be introduced into the site of injury or disease and induced to grow and differentiate, they will be able to repopulate the area with identical cells that form the normal tissue, without any trace of scar tissue. Alternatively, they might be grown into three-dimensional organs outside the body and then transplanted. A patient's own intrinsic stem cells might also be activated to repair the damage, much as a superficial skin wound is healed. The vision of regenerative medicine is to rectify all cellular damage caused either by age or disease.

The stem cell banking industry, a component of the stem cell industry, offers the service of cryogenically preserving stem cells. The immense potential of stem cell therapy has created an increasing demand for stem cell banks as private stem cell banking is a form of biological insurance. Banking of stem cells started in the early 1990s in the US. The first stem cell banks in Europe and Asia were set up during 1996-97. There was a large growth in the number of stem cell banks worldwide in 2001 and the stem cell banking industry is expected to grow at a CAGR of 25.8% from 2005 to 2010. The global stem cell banking industry in 2005 is worth an estimated RM7.2 billion.

The stem cell banking industry is at different phases in different parts of the world. UCBSB Banking is in its 'early adopters / pioneers' phase in countries like US and Europe, where it has been in operation for over a decade. UCBSB Banking in most other countries is at its introductory or 'early adopters' stage. PBSC Banking, on the other hand is at its introductory stage globally.

(Source: Frost & Sullivan)

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7.3.1 Overview Of The Stem Cell Banking Industry In Malaysia

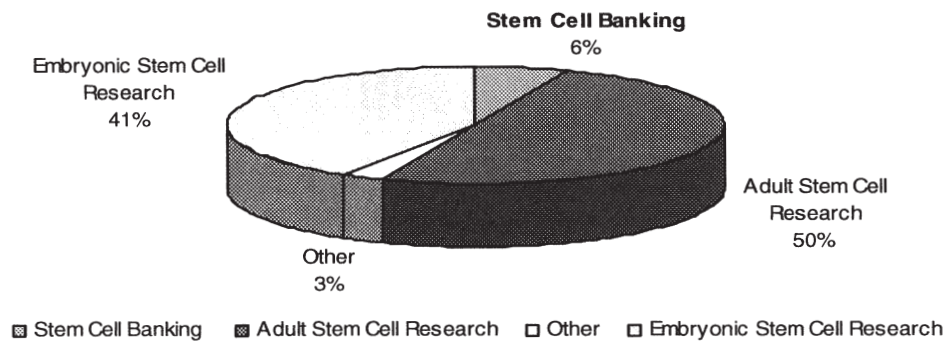
Stem cell banking, which was introduced to Malaysia in 2001 by the first private stem cell bank, StemLife, is in the introductory stage of the industry life cycle. Frost & Sullivan estimates that the combined Malaysian stem cell industry, including UCBSC and PBSC, will grow from RM10.8 million in 2005 to RM46.5 million in 2010 representing a CAGR of 33.8%. At present, UCBSC Banking dominates the stem cell banking industry in Malaysia comprising 99.3% of total storage whilst PBSC Banking represents the remaining 0.7%.

(Source: Frost & Sullivan)

7.4 MARKET SEGMENTATION FOR STEM CELL BANKING

The stem cell industry today is seen as a sunrise industry growing at a rapid pace with continuous and intensive R&D. The stem cell industry today largely comprises of R&D with stem cell banking being a small part of it as shown below:

Stem Cell Banking as a % of Total Industry, 2004



(Source: Centre for Bio-Medical Engineering)

This will change as R&D leads to successful drugs and therapies driving more people to bank their stem cells.

Stem cell banks are segmented into private and public banks. Private stem cell banks, collect and store stem cells for usage only by the donor or people nominated by the donor. It is in effect a manifestation of 'biological insurance' for people who have a family history of diseases and for new born babies.

Public stem cell banks store units that do not retain the ownership of the donor. Instead, they are philanthropically donated for research and transplantation purposes. These banks do allow prioritised access to stem cells when required but charges are levied on the person who may require the stem cells.

Globally, the public banks outnumber private banks in the case of UCBSC Banking. This scenario is changing into one where private storage is gaining popularity. In South Korea, for example, there are 16 private UCBSC banks today compared to 1 public bank. For PBSC, private banking is the popular option as it is looked upon as an insurance for oneself. The cost of stem cell therapy is considerable in the absence of private stem cell banking. Patients requiring well-matched stem cells may have to pay over RM380,000 in the absence of their own banked stem cells. At present, there are no public PBSC banks. Within Malaysia, in 2005, private banks represented 84.4% of total storage in the stem cell banking industry whilst public banks only account for 15.6% of total storage and only for UCBSC.

(Source: Frost & Sullivan)

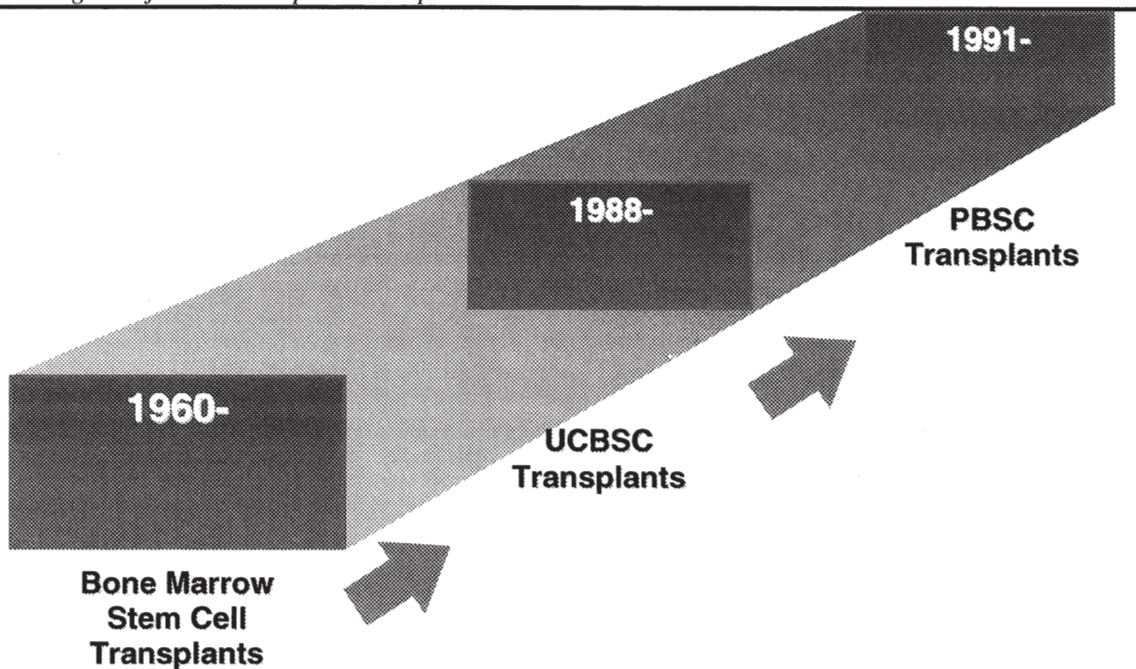
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7.5 BENEFITS OF PBSC AND UCBSC

Stem cell transplants can be broadly divided into three (3) types based on their source and method of extraction:

- Bone Marrow Stem Cell Transplants**
 Bone marrow extracted from the donor is directly used for transplantation. The extraction is a painful process and requires the expertise of a skilled physician during the surgery. As a result, this is slowly being phased out by the use of PBSC.
- UCBSC Transplants**
 Stem cells extracted from the otherwise discarded UCB are used for transplantation. Expecting parents may donate their baby's cord blood to a public bank or store their baby's cord blood with a private bank for possible use in the future.
- PBSC Transplants**
 Currently, these are being performed more often than bone marrow stem cell transplants. PB provides a more reliable number of stem cells, is easier to collect and less taxing on the donors. Recovery for the patient is faster in the case of PBSC transplants as compared to bone marrow stem cell transplants.

Progress of Blood Transplant Therapies



Advantages of PBSC and UCBSC

- Due to the problem of lack of donors given the painful extraction process and the incidence of graft-versus-host disease in the case of bone marrow stem cells, researchers have sought alternate sources of stem cells for transplant. Storing a person's stem cells ensures a perfect tissue match for that person with no chance of rejection, should the stem cells be required for transplantation.
- UCBSC may also be a match for siblings or parents. Transplantation centres worldwide have found that UCB is a viable alternative to bone marrow as a source of stem cells. Clinical evidence in reports has strongly suggested that the best results were achieved in patients who received UCBSC from related donors.

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- Other advantages of UCB over other sources for stem cell transplant (SCT) include: a readily available source, non-invasive collection method, a more naive, or less developed and more easily manipulated cell population, and lastly, no surrounding ethical issues unlike embryonic stem cell collection.

(Source: Frost & Sullivan)

7.6 SUBSTITUTE PRODUCTS/SERVICES

There are no substitutes for stem cells. However, stem cells sourced from UCB and PB may be substituted with stem cells sourced from the bone marrow.

The substitute for the PBSC harvesting technique or apheresis is bone marrow extraction. However, the extraction is an invasive, comparatively painful process and requires the expertise of a skilled physician during surgery. As a result, bone marrow extraction is slowly being phased out with PBSC harvesting.

In terms of stem cell preservation techniques, there are currently no alternatives to cryo-preservation and the Management does not anticipate any other alternatives becoming commercially available in the foreseeable future.

7.7 STEM CELL THERAPIES

Stem cell therapies can treat over 72 diseases today. This drives more than 45,000 people to receive stem cell transplants each year.

An increased population and a growing number of ageing people have contributed to a larger disease incidence and thus a larger market for therapy. In the US alone, the potential market for stem cell therapy today stands at RM18.8 billion.

US Potential Market for Stem Cell Therapy, 2005

Disease Group	Prevalence	Percent Likely to be Treated	Market (RM Million)
Autoimmune Disease	5,000,000	1	475
Cancer	8,000,000	1	760
Cardiovascular Disease		1	1400
Diabetes	15,000,000	5	7100
Genetic Disorder	500,000	20	950
Liver Disorder	400,000	90	3400
Nervous System	5,000,000	10	4700

(Source: Frost & Sullivan's Technical Insight Report, 2005)

In 2005, approximately 61% of Malaysia's population made up the middle and upper income group of the population. This means that the adoption of stem cell banking has a large market potential as the average Malaysian is able to afford it.

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The following table shows the prevalence of key conditions in Malaysia which are potentially treatable by stem cell therapies:

Malaysian Prevalence of Key Conditions Potentially Treatable by stem cell therapy in 2005

CONDITIONS	PREVALENCE
<i>Cancer</i>	140,000
<i>Coronary Heart Disease</i>	600,000
<i>Arthritis</i>	4,191,799
<i>Diabetes</i>	1,053,938
<i>Multiple Sclerosis</i>	31,663
<i>Thalassaemia (major)</i>	15,000

(Source: Frost & Sullivan)

The above analysis of the key conditions that can be treated by stem cell therapy in Malaysia show that in 2005, the full sales potential of stem cell therapy is an estimated 50,680 procedures. Assuming an average price of RM30,000 per procedure, the potential market size for stem cell therapy is worth approximately RM1.52 billion in 2005.

(Source: Frost & Sullivan)

7.8 INDUSTRY PLAYERS

According to Frost & Sullivan, there are two active competitors in the private UCBSC Banking market in Malaysia:

- StemLife; and
- CryoCord Sdn Bhd (“CryoCord”).

Frost & Sullivan’s competitive analysis shows that in 2005, StemLife is the leading private stem cell bank in Malaysia for both UCBSC and PBSC Banking. StemLife enjoys 100% market share in the PBSC Banking sector as it is currently the only player offering the service. StemLife leads the UCBSC Banking sector with 63% market share, followed by Cryocord with 37%. StemLife is the only company in Malaysia with the proven expertise in preparing stem cell for transplants whereby its first stem cell transplant was carried out in 2004. As at the Latest Practicable Date, the Company has been involved in nineteen (19) transplants (both allogenic and autologous) for the treatment of leukemia, thalassaemia major, heart disease, diabetic foot ulcer and lymphoma. All the stem cells engrafted successfully in the nine (9) patients with leukemia and lymphoma. All the patients with thalassaemia major remain transfusion free six (6) months after the transplant. All the patients with heart disease saw an improvement in the pumping efficiency of their heart after stem cell therapy while stem cells healed the foot ulcer in the three (3) patients with diabetes.

7.9 RELEVANT LAWS AND REGULATIONS GOVERNING THE STEM CELL BANKING INDUSTRY

Our operations are governed by the PHFS Act and PHFS Regulations which came into force since 1 May 2006 regulating the licensing and conduct of private blood banks such as that of the Company. The PHFS Act requires private stem cell banks to be approved by the Director General of Health and licensed to provide facilities. The PHFS Regulations pertain to the maintenance of standards for infrastructure, human resources and operations.

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Further, there are two government policies which impact the stem cell banking industry in Malaysia:

- the 'Biotechnology Policy 2005'; and
- the policies implemented by the MSC.

The positive financial and non financial implications that both policies have for Malaysian private stem cell banks are immense. The 10 year tax free incentive enables Malaysian private stem cell banks to operate on a significant cost advantage when compared with regional private stem cell banking enterprises. This is especially important for a company pioneering stem cell banking in the country where start-up costs are high and awareness of its services are low. The tax incentive will relieve the financial burdens borne by a start-up stem cell banking company, allowing it to better sustain operating profits for the initial 10 years.

(Source: Frost & Sullivan)

7.10 FUTURE PLANS, STRATEGIES AND OUTLOOK

The Company's value propositions are:

- to elevate Malaysia as a world-class stem cell therapy centre in South East Asia;
- to promote market awareness and confidence in stem cell treatment;
- to provide stem cell banking and related services at an affordable price;
- to stimulate R&D in stem cell sciences; and
- to attract foreign patients and clients to Malaysia in alignment with the Ninth Malaysia Plan of promoting health tourism.

The Group's future plans for the next two (2) years will be focused on achieving the above mission through the following strategies:

Market Share Expansion

We are currently the leading UCBSB bank and the only PBSC bank in Malaysia. We intend to maintain this position and further strengthen our brand name "StemLife", which is intended to be unanimous with the description of stem cells specialists, ranging from UCBSB Banking, PBSC Banking and stem cell therapies and consultancy services.

We have adopted the strategy of creating greater public awareness of our services and the benefits and potential of storing both UCBSB and PBSC through the following programmes:

- Continuing medical education (CME);
- Conducting and participating in ante-natal classes;
- In-house newsletter "REGENERATION" to customers, medical specialists, etc;
- Participation in conferences, exhibitions and trade shows;
- Private seminars to special interests group, associations, and large corporations;
- Feature articles in national newspapers;
- Our official website at www.stemlife.com;
- Selective advertisements in related magazines, journals, etc; and
- Brochures placed in strategic locations.

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Geographical Reach***Domestic Expansion***

We have expanded nationally with branch offices throughout Peninsular and East Malaysia. These offices support the hospitals and medical specialists where our clients deliver their babies or perform their PBSC transplants. We have, through our Penang office, consulted on five (5) PBSC transplants for lymphoma patients. We have identified our Penang, Ipoh, Johor Bahru, Kuching and Kota Kinabalu offices to be developed as regional offices in anticipation of increasing demand. In line with this plan, we also intend to enhance our logistics operations through the purchase of vans to facilitate the movement of samples from our branch offices to our laboratories in Kuala Lumpur and Cyberjaya.

In addition, we intend to set up a third laboratory which will have facilities for processing and testing of collected blood samples, cryo-preservation of stem cells and therapeutic research. The development of another facility is in line with Management's expectation of an increase in number of new customers and will allow us to handle any increase in samples. In addition, the third laboratory will enable us to enhance our stem cell therapeutic business. We will continue to improve and upgrade our existing laboratories to keep in line with technological developments. This will include automation of certain processes, expansion of our PBSC business and the purchase of additional cryogenic tanks.

Regional Expansion

To establish ourselves as the leading stem cell bank in the region, we have adopted the approach of setting up stem cell banks with strategic local partners in the various neighbouring countries with priority in Thailand and Indonesia, whereby we will provide the technical assistance in the setting up of a stem cell bank and the local partner will provide the infrastructure and logistics arrangements.

In April 2005, we have, through a joint venture arrangement, established a stem cell bank in Thailand with strategic local partners. We hold a 40% equity interest in Thai StemLife, the joint venture company. Behind Jetanin Co Ltd (a substantial shareholder of Thai StemLife), is Dr Jongjate Aojanepong, the leading in-vitro fertilisation specialist in Thailand. We have also set up a representative office in Jakarta to promote stem cell banking in Indonesia.

Stem Cell Therapies Development***R&D***

We are also investing in the future for our clients by undertaking downstream R&D programs with universities and specialist private medical research centres to carry out R&D in the areas of stem cell expansion and cancer immunotherapy through the use of dendritic stem cells. We are currently undertaking these aspects of R&D with NUS's Nanoscience and Nanotechnology initiative and CSKPL.

In addition, we are currently exploring other potential collaborative opportunities with stem cell companies with therapeutic experience to train local specialists and the treatment of spinal cord injury and cartilage damage.

Therapeutic Development

We work with local medical specialists to enable transplantation of stem cells for thalassaemia major, leukemia and bone marrow failure. We also seek to better understand and improve protocols of stem cell transplants by encouraging the publication of completed stem cell transplants.

Tie-Ups with Medical Practitioners

To further strengthen our dominant domestic position, we are continually entering into strategic tie-ups with specialist medical centres/physicians. Our first such partnership is with HSC, a leading private medical centre for heart treatment which will enable StemLife and HSC to provide PBSC therapies for heart patients. This approach of strategic tie-ups with specialist medical centres/physicians will allow us to tailor stem cell therapies for these specialist medical centres/physicians in their respective areas of specialisation.

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To-date, our strategic alliance with HSC has resulted in six (6) stem cell heart transplants being carried out with five (5) cases showing positive results and one (1) case being followed-up. With a high prevalence of heart disease in the country, we feel that this augurs well for the Company and the patients, who would otherwise not have access to such therapies or have to seek such treatment overseas.

Given our strategic future plans and the positive growth outlook of the stem cell banking market in Malaysia, we believe our prospects remain favourable.

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