Must-Read for all Expectant Families
所有准父母必读事项

cordlife
one chance, one choice.

Your Baby's **Precious**

# Umbilical Cord Lining

**Your Family's Medical Repair Kit**

## 您宝宝珍贵的脐带膜

您家庭的医疗修补储备

CellOptima™

Singapore's 1st Cord Lining Bank For Your Family
This service is brought to you by Cordlife Technologies Pte Ltd

# Are you expecting **a baby now?**

If you are expecting a baby, your pregnancy presents you a unique opportunity to save one of nature's best gifts to give your family members more medical treatment options when needed.

Cord blood and cord lining banking are becoming increasingly popular as people seek greater control of their own health. You can too, upon the delivery of your baby. This evidence-based leaflet on cord lining has been put together to help you make an informed decision.

# Quick Facts about Cord Lining

1. Cord lining stem cells have immune-modulating characteristics. Therefore matching of stem cells between donor and the patient may not be required, which makes them useful for both your baby and other members in the family.

2. Cord lining contains two types of powerful stem cells: Mesenchymal Stem Cells (MSC) and Epithelial Stem Cells (EpSC) as opposed to only MSC from Wharton's Jelly, another part of the umbilical cord.

3. With cord lining stem cells, your baby and family members will have more treatment options in the future, especially for disorders* that are incurable today such as stroke and heart attack. MSC can also help increase the success rate of a cord blood transplant.

4. Cord lining is a richer and denser source of stem cells compared to the Wharton's Jelly tissue so theoretically the desired number of cells required for treatment can be achieved at a much faster rate. Moreover, cells from cord lining grows faster as compared to those in Wharton's Jelly and hence, it will be more beneficial in treatments that are time sensitive which will require a shorter waiting time for cell growth[1].

5. When you store cord lining for your baby and family, you are storing the original source of stem cells, which can be used to support multiple medical treatments whenever needed.

6. Using cryogenic preservation technique, the therapeutic value of cord lining stem cells is preserved until the need for treatment arises.

7. Your baby only has one chance in a lifetime to have his/her cord lining collected as this painless and harmless process must be done at birth.

* in clinical trials

1. M. Stubbendorff T. Deuse, X. Hua et al., "Immunological properties of extraembryonic human mesenchymal stromal cells derived from gestational tissue," Stem Cells and Development, vol. 22, no. 19, pp. 2619–2629, 2013.

About Cordlife's Preferred

# Technical Protocol


| Parameter | Cordlife's Preferred Source | Other Sources |
|---|---|---|
| Source of stem cells | Cord lining (patent protected source) | Wharton's Jelly |
| Final form of cryopreserved product | Tissue | Cells |
| High yield | ✔ 20 million cells[2] per $cm^2$ | ✘ 54,000 cells[3] per $cm^3$ |
| MSC population | ✔ | ✔ |
| EpSC population | ✔ | ✘ |
| Will cryopreserved product be tested for biomarkers, cell viability, proliferation and sterility after 4 weeks of storage? | ✔ Tests are important to determine the identity of cells isolated and whether cord lining has been stored properly to support future medical treatments. | ✘ |
| Isolation technique | Explant culturing: through incubation of tissue to prevent possible cellular damage | Enzymatic digestion through destruction of extracellular meshwork of tissue to isolate cells |
| Cell yield# at passage 0 (P0) | 2.83 times[4] more cells than enzymatic digestion | Lower than explant culture |
| Tests performed on isolated & expanded cells | ✓ Count of cells<br>✓ Cell type/s confirmation using MSC and/or EpSC biomarkers<br>✓ Cell viability<br>✓ Sterility testing<br>✓ Endotoxin analysis<br>✓ Mycoplasma analysis | Only some of the tests are conducted |

2. Lim, Phan et al. "Epithelial and Mesenchymal Stem Cells From the Umbilical Cord Lining Membrane", Cell Transplantation, Vol. 23, 2014; pp. 497–503.

3. Christodoulou et al. Comparative Evaluation of Human Mesenchymal Stem Cells of Fetal (Wharton's Jelly) and Adult (Adipose Tissue) Origin during Prolonged In Vitro Expansion: Considerations for Cytotherapy", Stem Cells International 2013 (2013): 1-12.

4. Jong Hyun Yoon et al. "Comparison of explant-derived and enzymaticc digestion-derived MSCs and the growth factors from Wharton's Jelly"; BioMed Research International; vol. 2013; pp 1-8.

# #Why is it important[5]?

One of the key factors for successful cellular therapy is the amount of cells available for transplantation to provide a therapeutic effect. The cells from early passages are preferred for cellular therapy to prevent tumour formation.

5. S.Halfon, N.Abramov, B.Grinblat, and I.Ginis, "Markers distinguishing mesenchymal stem cells from fibroblasts are downregulated with passaging", Stem Cells and Development, vol. 20, no. 1, pp. 53-66, 2011.

# What is **Umbilical Cord?**

Umbilical cord is the connecting cord from the developing embryo or foetus to the placenta which allows blood to carry oxygen and nutrition to the baby in the womb. After the baby is delivered, the umbilical cord is cut and normally discarded with the placenta as medical waste until researchers became aware of its medical potential.

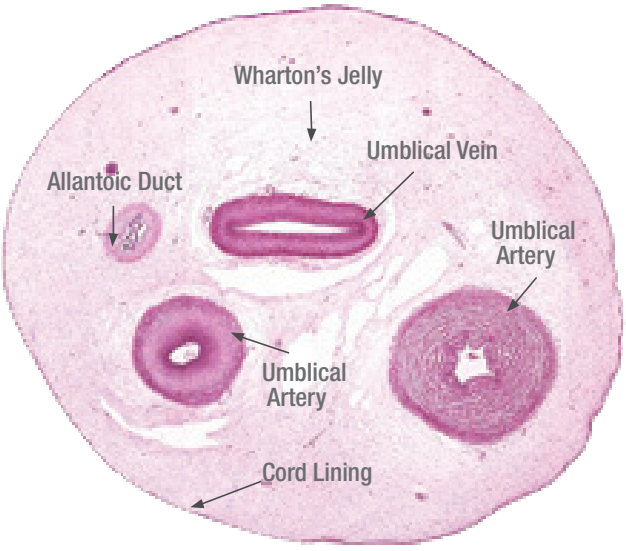



Fig. 1 Cross-section of an umbilical cord

# What is
# Cord Lining?

Other than containing cord blood, umbilical cord also contains Wharton's jelly, umbilical arteries, allantoic duct and an umbilical vein. These components are protected by a sheet-like membrane known as cord lining. Most companies use an open-source technique known as enzymatic digestion to isolate mesenchymal stem cells (MSC) from Wharton's jelly. Cordlife however, adopts a patented technology using explant culture method to isolate two important types of stem cells including MSC and epithelial stem cells (EpSC) from cord lining. This gives you and your family the access to more treatment options in the future.

**If I have decided to store my baby's cord blood, do I need to store cord lining too?**

Yes, we recommend you to store both cord blood and cord lining stem cells as each type of stem cells has unique healing ability. By storing all types of stem cells found in cord blood and cord lining, you are preserving a set of unique biological resources that is equivalent to a "self-repair kit" for your child and possibly, other family members.

Applications with

# MSC and EpSC

The table below outlines some of the potential applications with cord lining stem cells evaluated in more than 450 clinical trials[6] today. Most of these conditions have limited treatment options today. As clinical research continues to take place globally, this list will grow with time.

## Disorders investigated in MSC Clinical Trials (more than 450 trials currently)

- **Tissue repair**
  - Stroke
  - Heart failure
  - Alzheimer's disease
  - Parkinson's disease
  - Spinal cord injury
  - Orthopaedic indications (bone, cartilage, tendon repair)
  - Liver failure
- **Immune modulation or reconstitution**
  - HIV
  - Type 1 diabetes
  - Graft versus host disease (GvHD)
- **HSCs engraftment support**
  - Shorten time of engraftment
  - Reduce immune system complications

## Disorders investigated in EpSC Clinical Trials

- **Soft tissue repair**
  - Skin wounds
  - Ocular surface disorders
  - Persistent epithelial defect
  - Replacement of insulin-producing cells for diabetic patients
  - Haemophilia

6. https://www.clinicaltrials.gov/ct2/results?term=mesenchymal+stem+cells&Search=Search. Last assessed January 2015.

# MSC
## Application Reports

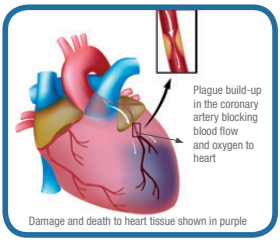
### MSC and Skeletal Repair

- Treatment for knee cartilage damage was conducted by National University Hospital, Orthopaedic Surgery of Singapore;
- Since 2006, 35 patients with worn knee cartilage underwent injection of autologous ex-vivo expanded MSC from bone marrow;
- Patients were reported to have improvements in quality of life such as regaining ability to climb stairs and reduction of pain.

Source: The Straits Times, Singapore – August 2009

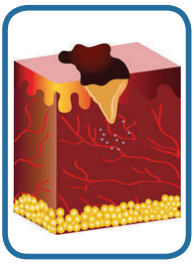
### MSC in Heart Attack

- 69 heart attack patients were treated;
- Following angioplasty, doctor directly injected patients' damaged heart site with MSC harvested from patients' own bone marrow;
- Results showed significant improvements in patients' left ventricular function.




Source: Chen SL et al. Improvement of cardiac function after transplantation of autologous bone marrow mesenchymal stem cells in patients with acute myocardial infarction. Chinese Medical Journal 2004 117(0): 1443-1448.

# EpSC
## Application Reports



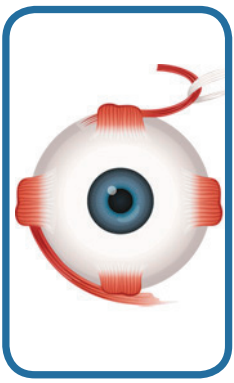
### EpSC and Wound Healing

- Treatment trial was conducted by Singapore General Hospital, Burn Centre;
- 8 patients with 10 skin wounds were treated with autologous and allogenic skin epithelium (keratinocytes) cultured and transplanted with polymer dressing aid;
- Rapid re-epithelialization, closure and healing of wounds observed.

Source: Tay AG et al. Cultured subconfluent keratinocytes on wound polymer dressings in the treatment of burns and chronic wounds. Wounds 2000 12(5):127-133.

### EpSC and Ocular Surface Disorders

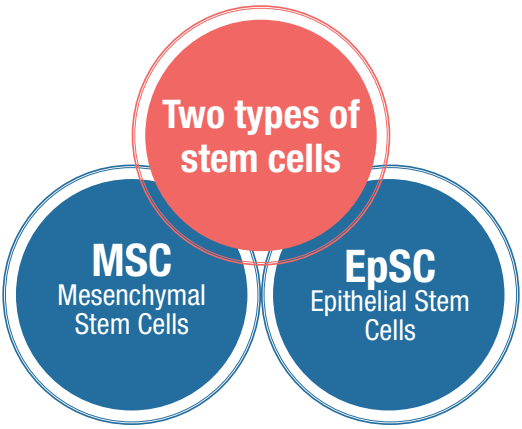
- Treatment trial was conducted by Singapore Eye Research Centre;
- 7 patients in Singapore with various ocular surface disorders received treatment;
- Autologous harvesting and cultivation of conjunctival epithelial stem cells were used;
- Transplantation of cultured stem cells on human amniotic membrane;
- All 7 patients fully recovered: disease resolution and complication free.



Source: Tan DT et al. Reconstruction of the ocular surface by transplantation of a serum-free derived cultivated conjunctival epithelial equivalent. Transplantation 2004 77(11): 1729-1734.

# Harness the Power of Cord Lining

with CellOptima™




**Patented Technology with 20 Patent Protection granted and 6 more pending**

*Cordlife is Singapore's only Authorised Company with CellOptima™.*

More than 20 years ago, bone marrow was found to contain MSC, then Wharton's Jelly from the umbilical cord was found to contain MSC as well. More recently, a team of award-winning doctors and scientists from Singapore made significant inroad in the world with the discovery of two powerful stem cell types: MSC and EpSC, from cord lining. Together, the Cambridge and Stanford University trained duo developed a unique technology known as CellOptima™, designed to harvest and multiply stem cells from cord lining. This revolutionary discovery subsequently led the team to receiving patent grants from 20 countries including the United States, China, Singapore, Hong Kong and patent grants from another 6 countries are still pending for final approval. These patents prohibit anyone other than the patent owner from harvesting stem cells from cord lining.

**Patent Certificate for Isolation of Stem Cells from Cord Lining**

THE REGISTRY OF PATENTS
SINGAPORE

THE PATENTS ACT
(CHAPTER 221)

CERTIFICATE OF GRANT OF PATENT

In accordance with section 35 of the Patents Act, it is hereby certified that a patent having the P No. 125482 [WO 2006/019357] has been granted in respect of an invention having the following particulars:

Title : ISOLATION OF STEM/PROGENITOR CELLS FROM AMNIOTIC MEMBRANE OF UMBILICAL CORD.

Application Number : 200700346-0

Date of Filing : 05 June 2005

Priority Data : 16 August 2004 - PATENT APPLICATION NO. 60/602,208 (UNITED STATES OF AMERICA)

1 December 2004 - PATENT APPLICATION NO. 60/632,209 (UNITED STATES OF AMERICA)

Name of Inventor(s) : PHAN, TOAN-THANH; LIM, IVOR JIUN

Name(s) and Address(es) of the Proprietor(s) of Patent : CELLRESEARCH CORPORATION PTE LTD (CELLRESEARCH RESEARCH CENTRE) BLOCK MD-11, 10 MEDICAL DRIVE, SINGAPORE 117597

Date of Grant : 30 September 2009

Dated this 30th day of September 2009.

Chiam Lu Lin (Ms)
Deputy Registrar of Patents
Singapore

## *CellOptima™ Assurances for You and Your Family*

With CellOptima™, you will receive the following assurances:

### Optimal Condition Assurance

Using CellOptima™ proprietary cell biomarker verification, your baby's cord lining will be tested after 4 weeks of cryopreservation. During this process, sample segments of the frozen cord lining will be thawed and MSC and/or EpSC will be harvested according to your choice of storage plan. This verification step is important as it helps ensure that your baby's cord lining has been properly stored and can be used for future medical treatments. The objective of this process is to validate the following:

✓ Cell type/s confirmation using MSC and/or EpSC biomarkers

✓ Cell viability

✓ Cell proliferation also known as the ability to multiply further

✓ Cord lining sterility

### Usability Assurance

Both MSC and EpSC harvested with CellOptima™ have been used successfully in human clinical applications. This gives you peace of mind knowing that what you are storing today, can really be used in the future to help your family.

### Technology Accessibility Assurance

As long as you remain a cord lining client of Cordlife, you are a guaranteed member of Global Cord Registry. As a member, you will have automatic access to CellOptima™ for the isolation and expansion of MSC and/or EpSC to support medical treatments.

Why Parents

# Bank Cord Lining with Cordlife

## Publicly Listed • Transparent Credibility

As a Singapore Exchange Mainboard listed company (SGX-ST: P8A), our group is audited annually by Ernst & Young and PricewaterhouseCoopers. As stem cell transplant or therapy may take place now or much later in life, choosing a company with sound and transparent financial status is crucial to ensure that the company is one you can trust to be here for the long haul.

## Most Experienced • Widest Network

Headquartered in Singapore, Cordlife Group has accumulated over 14 years of experience in the industry. Our in-depth knowledge is recognised by many world-class quality standard organisations as well as country regulators in Asia. In 2007, Cordlife was bestowed the prestigious "Technology Pioneer" title by the World Economic Forum, which further validated the Group's outstanding performance. Cordlife operates facilities across Asia in Singapore, Hong Kong, India, Indonesia and The Philippines as well as Malaysia and China through strategic investments.

## Authorised Company in Singapore with CellOptima™ : Giving You More Cell Types and Higher Possibility of Achieving Sufficient Cells At Earlier Passages

With CellOptima™, you and your family will have access to two types of cord lining stem cells that can be used to treat a variety of medical conditions, some of which are incurable today. Furthermore, cord lining contains more cells, therefore there is a higher possibility to culture the targeted number of cells required in earlier passages. Cells from early passages are preferred for cellular therapy to prevent tumour formation.

## Secure Processing and Storage Facility in Singapore

Located in A'Posh BizHub at Yishun, our state-of-the-art facility specially designed for laboratory setting. Our facility is fully managed by highly qualified and laboratory biotechnologists who have many years of blood and tissue banking experience. Built around stringent criteria set by the AABB (the world's gold standard in family cord blood banking), our facility is closely monitored round-the-clock and equipped with the most advanced fire protection system as well as multiple back-up systems for the provision of continuous power at all times.

## Post-Thaw Viability and Contamination Analysis

Cordlife provides post-thaw viability and contamination analysis on cord lining that has been cryopreserved for 4 weeks. Aimed to give you peace of mind, this analysis verifies if your baby's cord lining has been properly stored and can be used for future medical treatment.

## Flexible Storage Method

Cordlife adopts multiple cryovial storage method to give you the opportunity to use your baby's cord lining for more than one medical treatment. With this method, you can withdraw one cryovial at a time without affecting the viability of cord lining sections safely stored in other cryovials.

您正在期待

# 小宝宝的到来吗?

若您已经怀孕，正期待宝宝的来临，这对您的家人而言，是一份天赐的礼物。让他们将来有需要时，拥有更多医疗选择。

越来越多父母为了保障家庭的健康，已储存宝宝的脐带血及脐带膜。您在分娩时，也能这么做。这本以科学实证作根本的脐带膜干细胞小册子可供您作全面的参考。

# 脐带膜快览

1. 脐带膜干细胞能调节免疫系统，因此捐赠者及接受移植病患的干细胞配，无须吻合配对。这有效地保障您的宝宝和其他家庭成员。

2. 脐带膜共有两种强效的干细胞，如间质干细胞及上皮干细胞而华顿氏胶质（脐带的另一部份）只含间质干细胞。

3. 脐带膜干细胞为您宝宝及家中其他家庭成员的未来提供更多医疗选择，特别是直至现时仍无法治愈的失调病症* 如中风和心脏病。间质干细胞也能提高脐带血移植的成功率。

4. 脐带膜比华顿氏胶质含有更多细胞，所以理论上来说，要达到治疗所需的细胞量将会更快速。除此之外，脐带膜干细胞比华顿氏胶质干细胞生长的更快速。这对于急迫需要干细胞的治疗较为有利[1]。

5. 储存脐带膜，就是为宝宝及家人储存干细胞的源头。这让您在日后有需时，能取得更多干细胞支援多种医疗用途。

6. 应用低温储存技术，脐带膜的治疗价值会被保存在良好的状态，让您能在有需时用作治疗用途。

7. 您宝宝一生只有一次采集脐带膜的机会，采集过程完全安全无痛，不会造成任何伤害。

*临床研究

[1]M. Stubbendorff T. Deuse, X. Hua et al., “Immunological properties of extraembryonic human mesenchymal stromal cellsderived from gestational tissue,” Stem Cells and Development, vol. 22, no. 19, pp. 2619–2629, 2013.

关于康盛人生

# 技术首选

坚持选用脐带膜

| 影响因素 | 康盛人生首选来源 | 其它来源 |
|---|---|---|
| 干细胞来源 | 脐带膜<br>（来源受专利权保护） | 华顿氏胶质 |
| 最终冷冻产品形式 | 组织 | 细胞 |
| 高细胞采集量 | ✔<br>两千万细胞每平方厘米[2] | ✘<br>五万四细胞立方厘米[3] |
| 是否含有间质干细胞 | ✔ | ✔ |
| 是否含有上皮干细胞 | ✔ | ✘ |
| 是否会为已于低温储存超过4周的脐带膜进行解冻后活性及污染分析 | ✔<br>保证您宝宝的脐带膜已储存妥当，可用于未来治疗。 | ✘ |
| 隔离技术 | 块法分离：采用孵化术从组织外植干细胞，以防止细胞损伤 | 酶消化法： 通过拆卸式破坏组织外结构来隔离干细胞 |
| 零代细胞采集量# | 比酶消化法多出2. 8成[4]细胞 | 少于块法分离 |
| 在隔离和阔增的细胞上进行的化验 | ✓ 细胞数量<br>✓ 以细胞生物商标核实来确认细胞种类<br>✓ 细胞活性<br>✓ 细胞污染测试<br>✓ 内毒素分析<br>✓ 支原体分析 | 只进行一部分的化验 |

[2]Lim, Phan et al. “Epithelial and Mesenchymal Stem Cells From the Umbilical Cord Lining Membrane”, Cell Transplantation, Vol. 23, 2014; pp. 497–503.

[3]Christodoulou et al. Comparative Evaluation of Human Mesenchymal Stem Cells of Fetal (Wharton’s Jelly) and Adult (Adipose Tissue) Origin during Prolonged In Vitro Expansion: Considerations for Cytotherapy”, Stem Cells International 2013 (2013): 1-12.

[4]Jong Hyun Yoon et al. “Comparison of explant-derived and enzymaticc digestion-derived MSCs and the growth factors from Wharton’s Jelly”; BioMed Research International; vol. 2013; pp 1-8.

# #这为什么很重要[5]？

成功细胞疗法其中的关键因素是使用适当的细胞量以提供治疗效果。而初期代的细胞为首选，以防止肿瘤形成。

[5]S.Halfon, N.Abramov, B.Grinblat, and I.Ginis, “Markers distinguishing mesenchymal stem cells from fibroblasts are downregulated with passaging”, Stem Cells and Development, vol. 20, no. 1, pp. 53-66, 2011.

# 什么是

# 脐带?

脐带是连接胎盘和胎儿的管道，血液通过脐带，输送氧气和养分给子宫里的胎儿。脐带会在分娩后被剪掉，常与胎盘被当作医疗废物一并丢弃。直至近年，研究人员开始意识到脐带宝贵的医疗潜力。

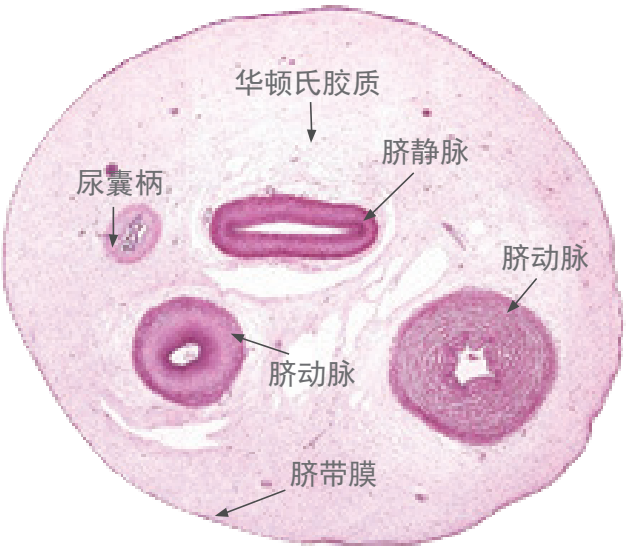



图1：脐带膜切面

# 什么是

# 脐带膜?

脐带内除了含有脐带血，还有华顿氏胶质、脐动脉、脐静脉及尿囊柄。它们均被一层薄纸般的薄膜保护，称为脐带膜。 大多数的脐带血库使用开源技术被称为酶消化，从华顿氏胶质提取间质干细胞。相对的，康盛人生采用突破专利技术，使用块法分离，从脐带膜隔离两种强效的干细胞。这两种干细胞包括间质干细胞及上皮干细胞，让您和家人未来获得更多治疗选择。

如果我决定储存宝宝的脐带血，是否还有需要储存脐带膜？

是的，我们建议您同时储存脐带血及脐带膜，因为它们各有本身独特的修复能力。储存所有脐带血及脐带膜中的干细胞，可为您的孩子及其他家庭成员提供独一无二的“自体修补储备”。

# 间质干细胞及上皮干细胞

## 应用潜力

以下简表列出脐带膜干细胞的临床研究应用潜力，至今已超过450项[6]，当中大部份的疾病仍是不治之症。随着各国大学和研究机构继续研究，其成果有望应用到更多疾病的治疗中：

### 间质干细胞应用于紊乱疾病的临床研究（至今已超过450项）

- 修复组织
  - 中风
  - 心脏衰竭
  - 阿兹海默症
  - 柏金逊症
  - 脊髓损伤
  - 骨科治疗（骨骼、软骨、修补筋腱）
  - 肝脏衰竭
- 免疫系统调节或重建
  - 人类免疫缺陷病毒
  - 一型糖尿病
  - 抗宿主疾病
- 辅助植入造血干细胞
  - 加快干细胞植入时间
  - 减少免疫系统并发症

### 上皮干细胞应用于紊乱疾病的临床研究

- 修复软组织
  - 皮肤伤口
  - 眼部表层肌肉衰竭
  - 永久上皮缺损
  - 为糖尿病病人更新胰岛素生成细胞
  - 血友病

[6]https://www.clinicaltrials.gov/ct2/results?term=mesenchymal+stem+cells&Search=Search. Last assessed January 2015。

# 间质干细胞

## 应用报告

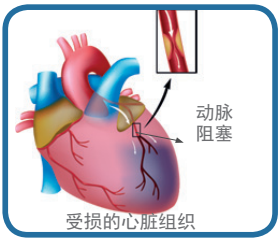
### 间质干细胞及骨骼修复

- 膝头软骨受损治疗;由新加坡国立大学医院骨科手术室主导研究;
- 自2006年，已有35名膝头软骨退化患者接受自体体外增生骨髓间质干细胞移植;
- 据报导，患者恢复上下楼梯的能力，痛苦减轻，因而改善了生活品质。

资料来源：新加坡海峡时报，2009年8月。

### 间质干细胞应用于心脏病

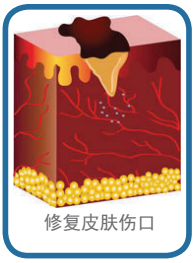
- 69名心脏病患者接受治疗;
- 在血管成形术治疗后，医生从患者自体骨髓取得间质干细胞并注射入心脏受损部位;
- 结果显示患者左心房功能有显著改善。




资料来源：Chen SL et al. Improvement of cardiac function after transplantation of autologous bone marrow mesenchymal stem cells in patients with acute myocardial infarction. Chinese Medical Journal 2004 117(0): 1443-1448.

# 上皮干细胞

## 应用报告


修复皮肤伤口

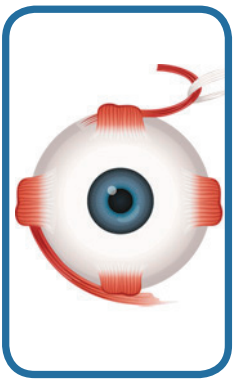
### 上皮干细胞及伤口痊

- 由新加坡中央医院烧伤中心进行治疗实验
- 8名患者身上共有10处皮肤伤口，进行自体及异体皮肤上皮细胞培植及配合聚合物绷带移植;
- 患者损伤部位移植表皮移植快速再生、伤口缝合及愈合。

资料来源：Tay AG et al. Cultured subconfluent keratinocytes on wound polymer dressings in the treatment of burns and chronic wounds. Wounds 2000 12(5):127-133.

### 上皮干细胞及眼部表层肌肉衰竭

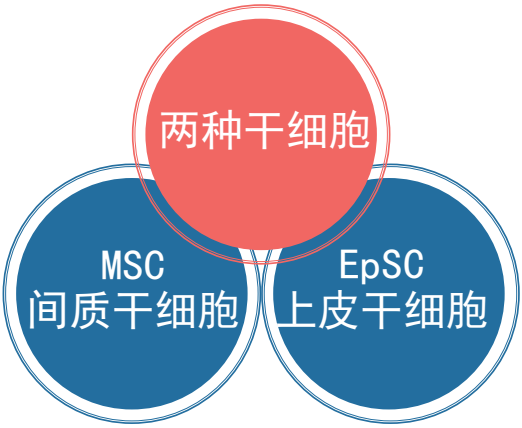
- 由新加坡眼科研究院进行治疗实验;
- 7名新加坡眼部表层肌肉衰竭患者接受治疗;
- 治疗应用患者自体上皮干细胞;
- 增生后的上皮干细胞应用人体羊膜为基底后移植入患者眼部;
- 所有7名患者完全康复：疾病痊愈，没有并发症



资料来源：Tan DT et al. Reconstruction of the ocular surface by transplantation of a serum-free derived cultivated conjunctival epithelial equivalent. Transplantation 2004 77(11): 1729-1734.

# 使用 CellOptima™

来充分发挥脐带膜的功效




独家专利科技－获得20国发明专利权，另在6个国家等审批

## 康盛人生是新加坡唯一拥有专利突破科技CellOptima™的脐带血脐带储存库

20多年前， 研究员发现骨髓及脐带里的华顿氏胶质都含有间质干细胞。近年， 新加坡一组得奖的医生及科学家团队取得进展，发现脐带膜中有两种强效干细胞－间质干细胞及上皮干细胞。这团队在剑桥和史丹福大学接受训练，并研发出独特技术－CellOptima™。这项技术，专门培殖及增生脐带膜中的干细胞。这项革命性的发现，让该团队取得20个国家的专利授权， 包括新加坡、美国、中国、及香港。同时，在另外6个国家，授权正等审批。这些专利明确地禁止除专利拥有者以外人士从脐带膜取得干细胞。

分离脐带膜干细胞专利证书

THE REGISTRY OF PATENTS
SINGAPORE

THE PATENTS ACT
(CHAPTER 221)

**CERTIFICATE OF GRANT OF PATENT**

In accordance with section 35 of the Patents Act, it is hereby certified that a patent having the P.No. [2942] [WO 2006/019375] has been granted in respect of an invention having the following particulars:

| | | |
|---|---|---|
| Title | : | ISOLATION OF STEM/PROGENITOR CELLS FROM AMNIOTIC MEMBRANE OF UMBILICAL CORD. |
| Application Number | : | 200703634-0 |
| Date of Filing | : | 03 June 2005 |
| Priority Data | : | 16 August 2004 - PATENT APPLICATION NO. 60/602,208 (UNITED STATES OF AMERICA)<br>1 December 2004 - PATENT APPLICATION NO. 60/632,209 (UNITED STATES OF AMERICA) |
| Name of Inventor(s) | : | PHAN, TOAN-THANG; LIM, IVOR JIUN |
| Name(s) and Address(es) of Proprietor(s) of Patent | : | CELLRESEARCH CORPORATION PTE LTD (SINGAPORE), 3 FUSIONOPOLIS WAY, BLOCK MD 11, 138542 CAL, DRIVE, SINGAPORE 117597 |
| Date of Grant | : | 30 September 2009 |

Dated this 30th day of September 2009.

Chiam Lu Liu (Ms)
Deputy Registrar of Patents
Singapore

## *CellOptima™ 给您与您家人的信心保证*

CellOptima™ 能给予您以下信心保证：

### 最佳状态保证

使用CellOptima™ 细胞生物商标核实，您宝宝的脐带膜会于冷冻4星期后进行测试。过程中，冷冻的脐带膜会解冻，然后根据您所选择的储存服务计划，采集间质或上皮干细胞。这项重要的核实步骤，能保证您宝宝的脐带膜已储存妥当，可用于未来治疗。这个过程能确保下列各项生效

✓ 以细胞生物商标核实来确认细胞种类

✓ 细胞活性

✓ 细胞增容能力（即继续分裂增生的能力）

✓ 脐带膜无污染测试

### 可用性保证

应用CellOptima™ 所采集及增容的间质干细胞和上皮干细胞，已进行人类临床研究并取得成功。因此您可放心知道，您现在所储存的脐带膜，能在未来给您与家人使用。

### 科技应用保证

客户如在康盛人生储存脐带膜，将自动成为全球脐带膜注册处的会员。成为会员后，我们可以为您应用CellOptima™ 来采集及增容间质干细胞及/或上皮干细胞作为医疗用途。

为何父母都

# 选择康盛人生储存脐带膜？

## 上市公司•透明度高

康盛人生新加坡主板上市公司(SGX-ST: P8A)每年经由安永及罗兵咸永道会计师事务所负责审核。正因为干细胞可能在现在或以后用于移植或治疗，所以您更要选择一家财政透明稳健而值得信赖的公司，为您提供长远保障。

## 丰富经验•最强网络

康盛人生集团总部设于新加坡,拥有14年脐带血与脐带膜处理及储存的丰富经验。康盛人生的专业品质已被许多国际机构及亚洲政府认证。在2007年,康盛人生更获颁极具权威的世界经济论坛“科技领导先驱”的名衔,进一步印证集团杰出卓越的表现。康盛人生的储存库遍布亚洲,包括新加坡、香港、印度、菲律宾及印尼，更在马来西亚及中国进行策略性投资。

## 拥有CellOptimaTM 专利技术的脐带血脐带储存库:给您更多种不同的干细胞及更高机会在初期代增生足够细胞量

使用CellOptima™,您和您的家人均可使用两种脐带膜干细胞用于多项疾病治疗，大部份更是至今还无法医治的。除此之外，脐带膜含有更多细胞量，所以要在初期代增生足够的细胞量的可能性很高。初期代的细胞为医疗首选，以防止肿瘤形成。

## 新加坡最可靠的处理及储存设备

我们设于义顺的A’ Posh Bizhub的实验室根据AABB(美国血库协会)的严谨要求建造,并由一支拥有丰富血和组织经验的化验师团队管理。同时,实验室设有24小时全天候保安装置、最先进的防火设备及后备系统,确保电供不会中断。

## 解冻后干细胞活性及污染分析

康盛人生会为已于低温储存超过4周的脐带膜进行解冻后活性及污染分析。上述分析能确保您宝宝的脐带膜已经储存妥当，可于将来需要治疗时使用，让您可以放心。

## 灵活储存方法

康盛人生采用多支特制抗冻管储存您宝宝的脐带膜，让您宝宝的脐带膜可使用于超过一项治疗。通过这种方式，您可以抽取其中一支抗冻管，而不会影响其它抗冻管组织的活性。

cordlife
one chance, one choice.

Find out more at:
您可以通过以下途径取得更多相关信息：

## 24-Hour Hotline
24小时热线
**6238 0808**

## Consultation Booths and Centre
康盛人生科技咨询台与中心

Mount Elizabeth Novena Hospital
伊丽莎白诺维娜医院
Mon – Fri (9am – 6pm), Sat (9am – 1pm)

Thomson Medical Centre 康生医院
Mon – Fri (9.30am – 5pm), Sat (9.30 – 12.30pm)

Thomson Diagnostic Ultrasound Centre
(Novena Medical Center 诺维娜医疗中心)
Mon – Fri (9am – 5pm), Sat (9am – 1pm)

Parkway East Hospital 百汇东岸医院
Mon – Fri (9.30am – 5pm)

**www.cordlifetech.com**

### About Cordlife Technologies
Cordlife Technologies is a wholly-owned subsidiary of Cordlife Group Limited.

The banking and storage of Umbilical Cord Lining service is not licensed by MOH as this is provided on a research/clinical trial* basis.

*For some patients, clinical research trials represent an avenue for receiving promising new therapies that would not otherwise be available. Patients with difficult to treat or currently "incurable" diseases, such as AIDS or certain types of cancer, may want to pursue participation in clinical research trials if standard therapies are not effective. Clinical research trials are sometimes lifesaving.[1]

Reference 1: MedicineNet, 2012. Definition of Clinical Trials. [Online] Available at: <http://www.medterms.com/script/main/art.asp?articlekey=2752> [Accessed on 1 February 2014].

DCR No. 2424 Version F, March 2015, Umbilical Cord Lining Banking Information Leaflet.