

會員專訊 /
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CRYOLIFE
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Since 1996



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間葉系幹細胞(可於臍帶中提取) 治療關節炎

Treat Osteoarthritis With Mesenchymal Stem Cells (also found in umbilical cord)



關節炎是一種常見的風濕病，通常病發於老年人的膝蓋。在老化的過程中，關節液會減少，再加上磨損，軟骨會變薄而發炎，引起明顯疼痛，長期患者或會出現關節僵硬甚至變形。¹

香港中文大學一項較早的研究發現，在香港 50 歲以上的華裔人口中，約有 7% 的男性和 13% 的女性患有膝蓋骨關節炎。由於膝關節的退化是無法逆轉的，因此在絕大部分的情況下終需以手術更換關節。²

最新研究顯示，間葉系幹細胞 (MSC) 可有效療法膝關節炎。

雖然細胞活動機制仍有待釐清，但早期臨床研究均對其安全性表示認同，並為其療效提供了許多正面的結果。直接注射 MSC 已被證明能夠幫助修復變性軟骨³，研究發現中度至重度膝關節炎的患者，在治療六個月後膝蓋功能有明顯改善，而其長期效果仍在觀察中。⁴

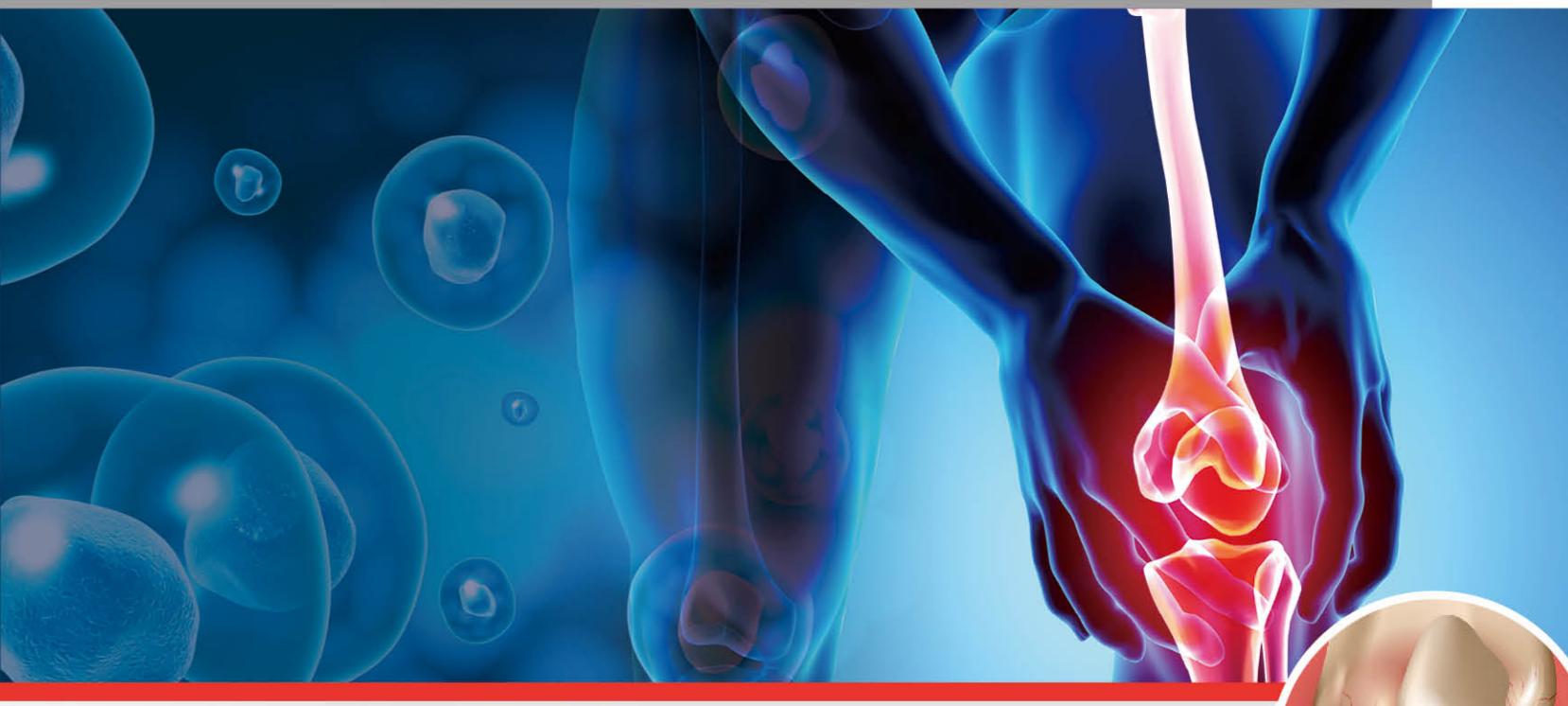
成年人的 MSC 通常於骨髓中提取，但最年輕、最原始的 MSC 可從臍帶組織中無風險獲得，因為臍帶組織一般在生產後就作為醫療廢物被丟棄。

A common rheumatic disease, osteoarthritis often affects the knees in the elderly. As part of the aging process, joint fluid decreases. Combined with wear and tear, the cartilage becomes thinner and inflamed, leading to significant pain and disability.¹

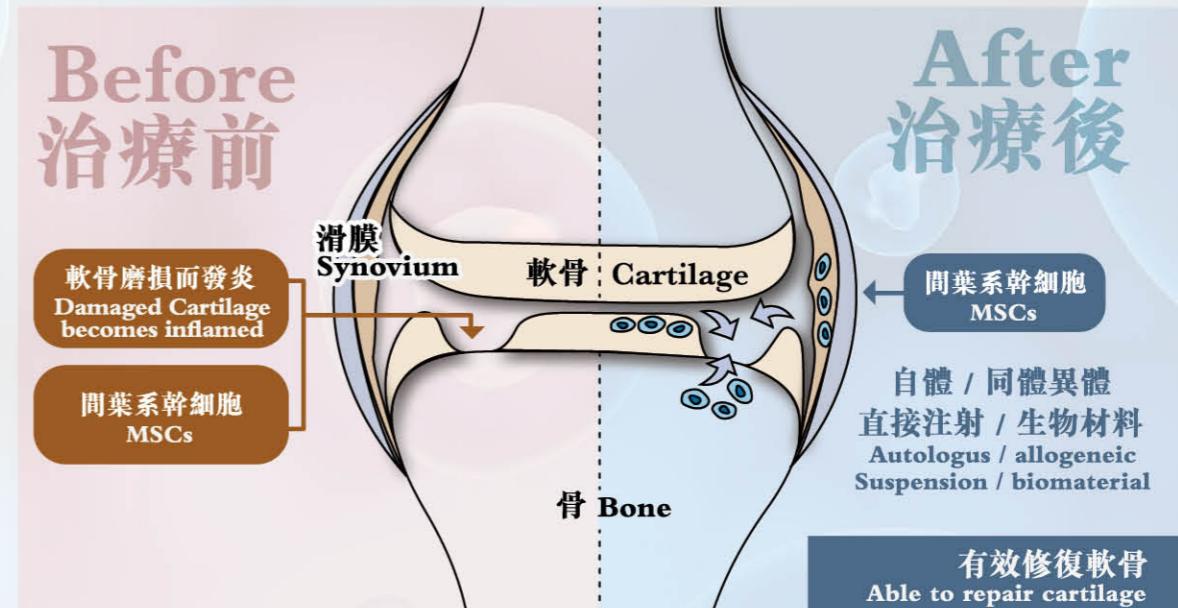
One earlier study by The Chinese University of Hong Kong finds that among the Chinese population above age 50 in Hong Kong, about 7% of men and 13% of women suffer from knee osteoarthritis. Since the degeneration of the knee joint cannot be reversed, joint replacement is ultimately required in most cases.²

Recently, mesenchymal stem cell (MSC)-based therapies have been used to treat this disease. While the exact mechanism is yet to be delineated, early-phase clinical studies concur on safety and provide some promising insight into efficacy. Injection of MSCs has been shown to be able to help repair degenerative cartilage.³ Patients originally suffer from moderate to severe knee osteoarthritis showed significant improvement in knee functions six months after the treatment, while its long-term effect is still being measured.⁴

In adults, the MSCs are usually extracted from bone marrow. However, the youngest and most primitive MSCs may be obtained from umbilical cord tissue, which is normally discarded but poses no risk for collection after baby birth.



Knee Cartilage Repair with Umbilical Cord-Derived MSCs



修復膝關節軟骨 Knee Cartilage Repair with MSCs

由 EuroStemCell 製作的簡短動畫，說明了軟骨損傷的原因以及目前治療方法的弊端；并展示以 MSC 作為「繃帶」的嶄新幹細胞治療，在治愈軟骨上取得的有效成果。

A short animation by EuroStemCell explains the reasons behind cartilage injury and drawbacks of current treatments. It shows how MSCs can be used as a sort of "stem cell bandage" to help heal the cartilage with promising results.

- 1. https://www.elderly.gov.hk/english/common_health_problems/bones_and_joints/osteoarthritis_knee.html
- 2. <http://www.cuhk.edu.hk/ipro/010306e.htm>
- 3. <https://www.sciencedirect.com/science/article/pii/S1471489217301376>
- 4. <https://onlinelibrary.wiley.com/doi/full/10.1111/1756-185X.12670>



權衡最佳選擇 Weigh Your Options

臍帶和臍帶血雖然蘊含豐富的幹細胞，但一般在生產後就作為醫療廢物被丟棄。隨著生物科學及再生醫學的急速發展，在面對危疾的時候，這些幹細胞可能發揮到決定性的作用。

臍帶血中的幹細胞已獲批准應用於治療 100 多種與血液有關的疾病；而近期利用幹細胞治愈脊髓損傷的研究也展示出令人鼓舞的結果。簡而言之，臍帶血包含多種極具高醫學價值的細胞。

若不幸患上危疾而需進行幹細胞治療，屆時可選擇從公共存庫中購入第三者的幹細胞（同種異體），僅一劑量份的幹細胞就可能涉及 50,000 至 100,000 港元的行政費。

如果提前計劃就可輕鬆節省這些支出。相比之下，Cryolife 以 24,000 港元起即可保存寶貴的臍帶血 18 年，以供寶寶及直系親屬所用，不僅可減輕面對危急醫療狀況時的經濟壓力，還可充分利用再生醫學的最新研究。

就等您作出明智的決定。

Considered as biological waste, both the umbilical cord and cord blood are often discarded after birth. With the rapid development of Bioscience Engineering and Regenerative Medicine, these specimens contain rich sources of stem cells which could be life-changing during critical illnesses.

Stem cells derived from cord blood is approved to treat more than 100 blood related disorders. Recently, studies on using stem cells from umbilical cord blood to heal spinal cord injury have also shown promising results. In essence, cord blood also contains other cells of high medical values.

In the event of an adverse medical condition which can be treated using stem cells, there is an option to procure third party's stem cells (allogenic) from public banks and this may cost between HKD50,000 to HK\$100,000 in administrative fee for merely one dosage.

You can easily save these future expenses simply if you plan ahead. Starting at HKD24,000, Cryolife provides cryopreservation services of your baby's precious cord blood for the next 18 years exclusively for your child, or immediate family members. This not only is an assurance for any unfortunate critical medical conditions, but also capitalising on the potential of emerging Regenerative Medicine.

Make the smart and wise decision now.



<http://bit.ly/374onTC>



2019 年 10-11 月品質檢定 (細胞活躍測試結果) Oct - Nov 2019 Quality Assurance (Variability Results)

■ 全面檢測・信心保證

CRYOLIFE 每年進行兩次品質檢定，從每個儲存缸內抽取最少一個樣本，進行全面而透明度高的檢測，顯示 CRYOLIFE 對實驗室儀器及專業技術人員的信心，測試結果亦會於在網頁上公佈。

一般幹細胞儲存庫都會作「解凍後幹細胞恢復之存活能力」測試，確保幹細胞解凍後仍具備理想的機能。不過，對 CRYOLIFE 而言，這只是最基本的測試，CRYOLIFE 更注重完整保存幹細胞最具醫療價值的特性。幹細胞的珍貴價值，全在於其自我倍增及自我分化的特性。因此，CRYOLIFE 多年前起引入「細胞聚落形成單位 (CFU)」測試，檢驗不同儲存年份的樣本是否仍能保持自我倍增及自我分化能力，簡單而言即是測試幹細胞在解凍後的活性。據國際品質鑑定機構 AABB 標準，血庫在發放幹細胞作任何醫療用途前，必須進行「細胞聚落形成單位 (CFU)」測試，以確保幹細胞品質，足以證明 CRYOLIFE 的定期質檢已到甚至超越國際水平。

CRYOLIFE 新一期的測試剛於 2019 年 10 月 25 日進行。此次檢測從儲存缸中提取了 9 份樣本檢測，當中，於 5 年前測試過的臍帶血樣品亦再度測試以作比較。結果顯示，不論長達 21 年的樣本在解凍後，恢復之存活能力均超逾 87%。總括而言，CRYOLIFE 的長期保存系統並沒有影響臍帶血幹細胞的活性。質量測試結果令人鼓舞，促使我們的客戶大可放心，孩子們的臍帶血幹細胞在 CRYOLIFE 冷凍保存下仍然活躍，可用於未來的治療。

■ Comprehensive Quality Assurance Test

Committed to deliver the highest service quality and taking pride in its cutting edge facilities, CRYOLIFE undertakes comprehensive quality assurance test twice a year. At least one dummy sample from different storage tanks – of all prior preservation years – will be evaluated with test results published on website.

Conventional cord blood banks will conduct Recovery of Viability Test to evaluate the preservation of stored stem cell's viability. CRYOLIFE's quality control and quality assurance go beyond that. Apart from basic tests, CRYOLIFE also conducts advanced Colony Forming Unit (CFU) Test to investigate the ability of proliferation and differentiation of hematopoietic stem cells. In essence, this means the ability to thaw stem cells to ensure its activeness after long term cryopreservation. According to AABB, the industry's leading authority, this CFU test must be performed before the cord blood is being released for any medical treatment to ensure the quantity, quality and stability of thawed stem cells meet transplantation requirements. This highlights CRYOLIFE's achievement in international assessment standard on stored stem cells from umbilical cord blood.

In the latest QA Test conducted from 25th October 2019, 9 dummy samples were selected according to schedule and thawed to evaluate their respective viability and CFU. For relevant comparison, a similar cord blood sample being tested 5 years ago was also selected in the recent QA Test too. The slight result differences are due to seeding and counting variations.

Overall, the result shows that the recovery of viability for all samples, even with a cryopreserved period of above 21 years are at least 87% with the mode range above 93% together active CFU. This result indicates that long term storage in CRYOLIFE has no negative effects on the cord blood stem cell's viability and CFU. The quality test result is encouraging and reassuring to our customers that their child's cryopreserved cord blood's stem cells with CRYOLIFE are still active and viable for future therapies.

臍血處理年份 (存放時間) Year of Storage (Storage Period)	解凍後幹細胞存活能力之恢復率 * Viability Recovery Rate*	細胞聚落形成單位 CFU ($\times 10^4/mL$)
2008 (11 年)	95.70	1.05
2006 (13 年)	93.00	2.03
2003 (16 年)	96.50	1.22
2003 (16 年)	94.80	1.10
2002 (17 年)	93.00	0.66
1998 (21 年)	87.10	0.26

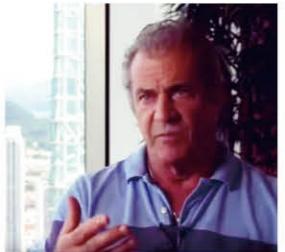
* 國際醫療指標的移植存活能力要求 : >50% International medical viability standard: >50%

品質檢定測試結果是來自隨機抽樣方式來選取樣本，測試結果並不代表其他儲存中的樣本會有相同結果。
QA Results shown are from randomly selected samples. It does not represent that other samples within the storage will bear the same result.

重複測試結果比較 Comparison of Repeat Evaluation

臍血處理年份 Year of Processing	測試日期 Date of Evaluation	存放時間 (年 / 月) Preservation Period (Y/M)	解凍後幹細胞存活能力之恢復率 * Viability Rate After Thaw*	細胞聚落形成單位 CFU
2000	25.10.2019	19 年	89.30	0.29
	24.04.2014	14 年	82.50	0.35

焦點案例 NEW CLIPS



<http://bit.ly/2Sl7wqu>



幹細胞療法經驗之談 Mel Gibson Advocates Stem Cell Therapy

國際巨星 Mel Gibson 分享他在巴拿馬幹細胞研究所的經驗，創始人 Neil Riordan 醫生以間葉系幹細胞（MSC）拯救了他在病榻上 92 歲高齡的老父親。作為著名的幹細胞應用科學家，Riordan 醫生淺淺的解釋了幹細胞的來源、適用於幹細胞治療的多種疾病及其原理。他的研究成果亦顯示，臍帶中的間充質幹細胞比成年人的功效更顯著。

Acclaimed actor Mel Gibson shares his experience at the Stem Cell Institute in Panama, where founder Dr. Neil Riordan saved his 92-year-old father on deathbed with mesenchymal stem cells (MSC) derived from umbilical cords. Dr. Riordan, a renowned applied stem cell scientist, explains where the stem cells come from, how they work and why they can treat so many seemingly different conditions. He also finds the MSCs from umbilical cords function exponentially better than those from adults.



<http://bit.ly/2UruwXk>



臍帶血可逆轉腦損傷 Cord Blood To Reverse Brain Damage

來自密歇根州的五歲幼兒 Samantha 差點遇溺身亡，儘管在昏迷一周後恢復了意識，但她遭受了嚴重的腦損傷，無法走路、說話或進食。通過注入姐姐儲存的臍帶血，Samantha 現在加入了美國杜克大學的研究。負責骨髓移植計劃的 Joanne Kurtzberg 博士認為，臍帶血中的「單核細胞」可以釋放特殊的化學物質，刺激大腦神經重新建立連接，有望在不久將來取得滿意的成果。

A family from Michigan was left heartbroken after a near-death drowning of their five-year-old daughter Samantha. Although the toddler regained consciousness after a week of coma, she had sustained severe brain damage that restricted her from walking, talking or feeding herself. Using the cord blood stored from her sister, Samantha now joins the study at Duke University. Dr. Joanne Kurtzberg of the bone marrow transplant program believes that the cell “monocyte” in the cord blood can release special chemicals to stimulate the brain to make new connections in nerve fibers. Positive results are expected soon.



<http://bit.ly/3bhI7rB>



首位接受臍血移植的患者生活愉快 World's First UCB Transplant Patient Living Well

在 1988 年，五歲的 Matthew Farrow (來自美國) 成為世界上首位接受臍血移植的患者。他患有罕見的遺傳病，導致骨髓衰竭，在法國接受剛出生妹妹的臍帶血後，得到了有效的治療，目前以丈夫和父親的身份過著健康正常的生活。他指出：「許多醫生沒有向準父母充分解釋臍帶血的用處。」作為臍帶血幹細胞療法的活見證，他經常參加醫學會議，以提高公眾對臍帶血的認識及解釋有關儲存的選擇。

In 1988, the five-year-old Matthew Farrow became the first in the world to receive a cord blood transplant in United States. He suffered from a rare genetic disease that resulted in bone marrow failure. After receiving the cord blood from his newborn sister, he was effectively cured and is currently leading a normal and healthy life as a husband and father.

“I think a lot of doctors don't explain cord blood options to expectant parents as well as they could,” Farrow said. A living testimony to the cord blood stem cells therapy, he travels to medical conferences to raise cord blood awareness and educate the public about banking options.



<http://bit.ly/2GZrSJW>



臍帶幹細胞治療肺病 Cord Blood Research To Cure Lung Disease

台灣陽明大學正在研究「特發性肺纖維化」的治癒方法。據估計，在台灣每 10 萬人中就有約 6.4 人罹患此絕症，由於肺部組織結疤，喪失氣體交換功能，患者平均存活期僅一年左右。研究團隊發現，人類的臍帶間質幹細胞不僅能修補結疤痕組織，還能讓肺泡再生。目前這項研究領先全球，下一步將進入臨床實驗階段。

The National Yang-Ming University in Taiwan is pioneering a research to cure Idiopathic Pulmonary Fibrosis (IPF) with cord blood stem cells. Patients suffering from IPF — an irreversible disease derived from scarring of the lungs — have a life expectancy of about one year. It affects approximately 6.4 out of every 100,000 people in Taiwan.

The research team at National Yang-Ming University found that the mesenchymal stem cells (MSC) from the umbilical cord can remove the scarred tissues and stimulate the regeneration of healthy cells. Clinical trials begin soon.

再次展示出臍帶組織在危疾治療上的巨大醫學潛力
Another great potential on use of umbilical cord for critical medical conditions

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第三方 醫療專家團隊

協助索償評估，確保審核獨立和公平

Independent Panel
of Medical Experts assess each claim
independently and fairly



所有索償均由臍血幹細胞醫療專家所組成的團隊協助進行，參與評估所患的疾病及索償個案。

Every claim is independently reviewed by a panel of experts. They are professionals with many years of experience in stem cell therapy to access the medical illnesses and claims.