

**Name of Journal:** *World Journal of Stem Cells*

**Manuscript NO:** 57915

**Manuscript Type:** REVIEW

### Prospects for the therapeutic development of umbilical cord blood-derived mesenchymal stem cells

Um S *et al.* Therapeutic development of UCB-MSCs

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#### Abstract

Umbilical cord blood (UCB) is a primitive and abundant source of mesenchymal stem cells (MSCs). UCB-derived MSCs have a broad and efficient therapeutic capacity to treat various diseases and disorders. Despite the high latent self-renewal and differentiation capacity of these cells, the safety, efficacy, and yield of MSCs expanded for *ex vivo* clinical applications remains a concern. However, immunomodulatory effects have emerged in various disease models, exhibiting specific mechanisms of action, such as cell migration and homing, angiogenesis, anti-apoptosis, proliferation, anti-cancer, anti-fibrosis, anti-inflammation and tissue regeneration. Herein, we review the current literature pertaining to the UCB-derived MSC application as potential treatment strategies, and discuss the concerns regarding the safety and mass production issues in future applications.

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## Umbilical Cord Blood-Derived Mesenchymal Stem Cells ...

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3696928>

May 01, 2013 · However, because of donor morbidity and small expansion capacity, other sources of MSCs would be of considerable use for **cancer therapy** . **Umbilical cord blood-derived MSCs (UCB-MSCs)** are being evaluated for use in **cell therapy**. **UCB-MSCs** are in a primitive stage, provoke less immune response, and possess large expansion capacity [2,7,8]. Of note, **UCB-MSCs** can be ...

**Cited by:** 132**Author:** Keiko Akimoto, Kenichi Kimura, Masumi ...**Publish Year:** 2013

## Human Umbilical Cord Blood-Derived Mesenchymal Stem ...

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4238943>

Human umbilical cord blood-derived **mesenchymal stem cells (hUCB-MSCs)** were viable 4 wks after injection into **cultured rabbit intervertebral disc explants**. **Nucleus pulposus (NP) tissues** were scooped out and examined by **confocal fluorescent microscopy**....

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**Therapeutic effects of umbilical cord blood-derived mesenchymal stem** cell transplantation in experimental lupus nephritis. Chang JW(1), Hung SP, Wu HH, Wu WM, Yang AH, Tsai HL, Yang LY, Lee OK. Author information: (1)Division of Immunology and Nephrology, Department of Pediatrics, Taipei Veterans General Hospital, Taipei, Taiwan.

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**Publish Year:** 2011

## Human Umbilical Cord Blood-Derived Mesenchymal Stem Cells ...

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3396141>

Jul 20, 2012 · Since human **mesenchymal stem cells** (MSCs) are therapeutically attractive for tissue regeneration and repair, we examined the physiological responses of human **umbilical cord blood-derived** MSCs (hUCB-MSCs) to genotoxic stress. We found that that ...

**Cited by:** 99

**Author:** Eun Ko, Kyung Yong Lee, Deog Su Hwang

**Publish Year:** 2012

## Therapeutic Effects of Human Umbilical Cord Blood-Derived ...

<https://pubmed.ncbi.nlm.nih.gov/21939558>

**Therapeutic Effects of Human Umbilical Cord Blood-Derived Mesenchymal Stem Cells** After Intrathecal Administration by Lumbar Puncture in a Rat Model of Cerebral Ischemia **Stem Cell Res Ther** . 2011 Sep 22;2(5):38. doi: 10.1186/scrt79

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whether **transplantation** of **human umbilical cord blood-derived MSCs** (uMSCs) is useful in alleviating **lupus nephritis** in a **murine model**. It was found that **uMSCs transplantation** significantly delayed the **development of proteinuria, decreased anti-dsDNA**, alleviated **renal injury**...

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Author: Jei-Wen Chang, Shun-Pei Hung, Hao-Hsian...

Publish Year: 2011

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<https://pubmed.ncbi.nlm.nih.gov/30270645>

**Therapeutic Effects of Umbilical Cord Blood-Derived Mesenchymal Stem Cells** Combined with Polydeoxyribonucleotides on Full-Thickness Rotator Cuff Tendon Tear in a Rabbit Model Cell Transplant . 2018 Nov;27(11):1613-1622. doi: 10.1177/0963689718799040.

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Author: Dong Rak Kwon, Gi-Young Park, Yong Suk ...

Publish Year: 2018

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<https://pubmed.ncbi.nlm.nih.gov/21939558>

**Therapeutic Effects of Human Umbilical Cord Blood-Derived Mesenchymal Stem Cells** After Intrathecal Administration by Lumbar Puncture in a Rat Model of Cerebral Ischemia **Stem Cell Res Ther** . 2011 Sep 22;2(5):38. doi: 10.1186/s13287-019-1545-x

Cited by: 136

Author: Jung Yeon Lim, Chang Hyun Jeong, Jin Ae ...

Publish Year: 2011

### [Therapeutic evidence of umbilical cord-derived mesenchymal ...](#)

<https://stemcellres.biomedcentral.com/articles/10.1186/s13287-019-1545-x> ▼

Feb 03, 2020 · The **therapeutic** window, transfusion route, and dosage in our study were considerable for reference in clinical application. Chictr.org.cn, ChiCTR1800016554. Registered 08 June 2018—retrospectively registered. The public title was “Randomized trial **of umbilical cord-derived mesenchymal stem cells** for cerebral palsy.”

Cited by: 3

Author: Jiaowei Gu, Jiaowei Gu, Li Huang, Che Zha...

Publish Year: 2020