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INTRODUCING

## RICHGEN®

TRANSFUSIONS

NanoMedicine Therapeutics



## UMBILICAL CORD BLOOD TRANSFUSIONS

# Revitalize | Restore | Renew

### LIFE EXTENSION RESEARCH THAT ENRICHES YOUR BODY

Advances in regenerative medicine, cell and gene therapy research and life sciences can now enrich your bloodstream with ABO matched blood types from cord blood. Newly developed natural biological therapeutics now provide ethically sourced cord blood donated during caesarian births. The process follows the gold standard AABB (American Association of Blood Bank) regulations for best practices right from procurement, to processing, testing and follows the highest standards that are strictly met in selecting the material that must pass extensive screening for safety and efficacy.

**CORD BLOOD TRANSFUSIONS** is an HCT/P therapeutic derived from the umbilical cord blood (UCB) of a newborn.

Each cryo-frozen UCB Transfusions bag (25 ml/cc) consists of approximately 450 - 900 million total nucleated cells and is registered with the World Registry (WMDA) for provision of care for patients needing transfusions. The UCB Transfusions bag thaws in



approximately 8 minutes and it is important to use within 30 - 60 minutes.

### UCB CONSISTS OF:

The cellular component, which is primarily composed of lymphocytes, monocytes, B-lymphocytes, and a lower absolute number of T-lymphocytes ( $CD3+$ ) with higher  $CD4+/CD8+$  ratio, along with higher numbers of NK cells and low number of  $CD56+$  cytotoxic T-lymphocytes, higher proportion of immature T-lymphocytes ( $CB45RA+$ ) and decreased numbers of mature memory T-lymphocytes ( $CD45RO+$ ), and an important spectrum of growth factors.

UCB cells also produce-

- Cytokines- the mRNA that is expressed in UCB, has the anti-inflammatory cytokines such as,
  - interferon- $\gamma$  (INF- $\gamma$ ), interleukin (IL)-4 and IL-10 are abundant.
  - proinflammatory cytokines IL-2.

A large population of hematopoietic stem/progenitor cells (HPC) compared to adult sources.

- These easily procured, immunogenic sources of multipotential cells are thought to have the capability to become any type of cell in the body under specific conditions.

Nonhematopoietic stem cells, the mesenchymal stem cell (MSCs), are also found in UCB; in lower numbers.

- The MSCs can potentially give rise to such diverse phenotypes as osteoblasts, chondroblasts, adipocytes, and hematopoietic and neural cells (astrocytes and neurons). Yang et al.

- The cryogenic freezing temperature of  $-150^{\circ}\text{C}$  is maintained to preserve the MSCs in a suspended state with approximately 10%+/- DMSO as a preservative.



UCB Transfusions is screened as per the FDA requirements, and is processed according to the Public Health Services Act 351 regulations.

They follow the industry gold standard for cellular therapies, the America Association of Blood Banks (AABB) in bio-laboratory clean rooms.

UCB Transfusions is tested to the highest standards for safety, quality, identity, purity and potency in CLIA (Clinical Laboratory Improvement Amendments) at a bio-laboratory as per the FDA requirement.

An UCB product data report Certificate of Analysis (CoA) accompanies each shipment.

The ABO blood compatibility system has four main blood groups: A, B, AB and O, with a matching chart for recipients ABO group.

FDA registered and inspected. AABB accredited. NMDP registered. Registered where required in New Jersey, New York, Maryland, California Cord Blood License, California Tissue License, Illinois and Delaware, USA.

Shipping worldwide for research in cryogenic canisters. USA shipped in dry ice. The International Organization for Standardization (ISO 21973) guidance is used for the regenerative medicine supply chain in the transportation of cells and gene therapies.

For use according to current FDA in the USA and Health Ministry guidelines requirements for each country.

# CORD BLOOD LIFE EXTENSION CLINICAL RESEARCH

## Umbilical Cord Blood: Current Uses For Transfusion and Regenerative Medicine

Nicoletta Orlando et al Transfusion and Apheresis Science 59 (2020) 102952. Umbilical cord blood (UCB) is an alternative to bone marrow as a source of hematopoietic stem cells for the transplant of children and adults with hematological disease. No acute or delayed transfusion-related adverse events occurred.

## Umbilical Cord Derived Mesenchymal Stem Cells on Osteogenic Differentiation of MSCs.

Wang et al. (2015). The Effects of Secretion Factors from Umbilical Cord Derived Mesenchymal Stem Cells on Osteogenic Differentiation of MSCs. PLOS ONE. 10. e0120593. 10.1371/journal.pone.0120593 ELSEVIER Journal. Factors synthesized by MSCs contain various growth factors, cytokines, exosomes and microRNAs, which may affect the differentiation abilities of MSCs. Our study indicates that hUCMSCs secretion factors may be potential sources for promoting bone regeneration.

## Umbilical Cord Mesenchymal Stem Cells in Patients With Heart Failure

Safety and Efficacy of the Intravenous Infusion of Umbilical Cord Mesenchymal Stem Cells in Patients With Heart Failure, Jorge Bartolucci et al. Clinical Track August 24, 2017 DOI:10.1161/CIRCRESAHA.117.310712 Improvements in left ventricular function, functional status, and quality of life were observed in patients treated with UC-MSCs.

## Umbilical Cord Blood: An Evolving Stem Cell Source for Sickle Cell Disease Transplants

Shalini Shenoy. May 2013. Allogeneic hematopoietic stem cell transplantation has proven benefit in controlling sickle cell disease-related vasculopathy and organ damage.

As published in "The role and potential of umbilical cord blood in an era of new therapies: a review" Santiago Roura, Josep-Maria Pujal, Carolina Gálvez-Montón & Antoni Bayes-Genis

## Angiogenesis in a. Behçet's multisystem disease b. Autistic Children

Owing to the UCB enrichment in vascular progenitors, angiogenesis has been induced in a 27-year-old woman with Behçet's multisystemic disease and in autistic children who had received cells derived from CB cell source.

## Safety and Efficacy of combined transplantation/transfusion in autism.

**Lv et al.** have also reported preliminary results from a non-randomized, open-label, single-center phase I/II trial investigating the safety and efficacy of combined transplantation of human cord blood-derived MNCs and MSCs from umbilical cord in children with autism. These authors have concluded that the combination of the two cell types shows larger therapeutic effects than the transplantation of MNCs alone (NCT01343511).

## Benefits in treating Diabetes Mellitus type 2 and was found to be safe and ethical.

In addition, Zhao et al. have reported benefits in the context of diabetes mellitus type 2 with no safety and ethical concerns associated with conventional stem cell-based approaches. In particular, in that study, patients received one treatment with the Stem Cell Educator therapy in which a patient's blood is circulated through a closed-loop system that separates MNCs from the whole blood, briefly co-cultures them with adherent cord blood-derived multipotent stem cells, and returns the educated autologous cells to the patient's circulation (NCT01415726).



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