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Editorial

Optimization of Umbilical Cord Tissue

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INTRODUCTION

Especially asthma and Chronic Obstructive Pulmonary Disease (COPD), are responsible for the death of approximately 4 million people yearly worldwide . Air pollution, smoking, inflammation, and genetic mutations contribute to lung diseases by deteriorating lung capacity and impeding ventilation and the supply of adequate oxygen to the body. He symptoms of lung disease may include dyspnea, wheezing, cough, and chest pain with the underlying pathogenic mechanisms for most lung disease being inflammation and infection . Severe inflammation and the inability to resolve it ultimately leads to build up of infectious pathogens, such as Pseudomonas aeruginosa, and can generate severe lung damage, resulting in pulmonary failure . Human Umbilical Cord Blood (HUCB) has been previously utilized as a source of hematopoietic stem cells. Hese HUCB stem cells are multi- potent and have been shown to have regenerative, antiinflammatory, and bioactive properties . hMSCs derived from cord blood and Bone Marrow (BM) are bioactive and can be used to ameliorate inflammation and to augment bactericidal capabilities in asthma and CF . In the majority of clinical trials, hMSCs have been derived from BM aspirates of healthy volunteers, which is both an invasive and a costly procedure . HCT has been investigated as a potential, rich source of hMSCs, as it is oien discarded as human medical waste . Further, with the availability and abundance of a source material, the non-invasive collection procedure, and the lack of ethical concerns that are associated with other sources, HCT are an attractive option for therapeutic hMSC sourcing. In these studies, we profiled HCT hMSCs ability to produce and secrete. anti-inflammatory products, ultimately pursuing the identification of the mechanistic response of HCT hMSCs through phenotypic properties in inflammatory scenarios, such as bacterial analog exposure. We further determined the functional capacity of Journal of Stem Cell Research & Therapy Finally, we present

options for HCT growth optimization towards specific anti-inflammatoryproperties, and define donor variability as a factor to be considered when utilizing HCT hMSCs as a therapeutic source. He innovative nature of the results in this manuscript, as well as their alignment with our findings in BM derived hMSCs demonstrate the unique role hMSCs can play in terms of their therapeutic potential for chronic inflammatory diseases. Hus, HCT hMSCs may be considered as an economical, advantageous, and potent resource of stem cells for therapeutic development.He A549 epithelial cells were grown in ATCC media in the presence of L-glutamine, with 5000 units/mL of both Penicillin (base) and Streptomycin to prevent bacterial contamination of the epithelial cells , and were utilized at. Cells were grown in 2 mL of A549 media. One day prior to harvest, 1 mL of cord tissue media was added in place of 1 mL of A549 media. Hree hours later, they were cultured with cord tissue media, followed by stimulation with or without LPS. Cells were harvested 24 hours post stimulation and cell pellets were saved for gene expression assays using Taqman Real Timeithelial cells were stimulated with cord media, cord stem cells (1 mL cord stem supernatant with 1 mL epithelial cell mediand cord stem cells with LPS. Cells were studied to determine if the cord tissue stem cells had an antiinflammatory e ect against the epithelial cells and LPS.

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