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Isolation and Characterization of Rabbit Bone Marrow Mesenchymal Stem Cells

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Due to the fact that mesenchymal stem cells (MSC) derived from adult bone marrow possess the potential to differentiate into a range of tissues, much research has been conducted in the attempt to use these cells for clinical applications. However, most studies have been carried out on human and murine models resulting in a lack of data on the rabbit model. Understanding the biology of rabbit MSCs is important as this animal is a key model utilized in autologous tissue transplantation studies. Herein, this study aims to isolate and characterize multipotent MSCs from rabbit bone marrow for future application in tissue regeneration. MSCs were isolated from rabbit bone marrow by Ficoll gradient centrifuge and expanded in DMEM (high glucose) supplemented with 10% fetal bovine serum, 1% antibiotic-antimycotic and 2 mM glutamine. The morphology of the isolated cells was assessed by Haematoxylin and Eosin staining. A major surface antigen of MSCs, CD44 will be analyzed qualitatively by immunocytochemistry staining. Further analysis using flow cytometry will also be conducted in order to assess the purity of the MSCs isolated. The functional characteristics of the isolated MSC cells will be determined by *in vitro* induction of chondrogenesis and osteogenesis. Our results showed that MSCs derived from bone marrow appeared as heterogeneous cell populations. Three types of cell morphology could be observed; spindle-shaped cells, large flat cells and rounded cells. After characterization of these cells, they will be differentiated into chondrocytes and osteocytes *in vitro* on exposure to chondrogenic and osteogenic medium respectively. Preliminary analysis from this study has been promising and the results will be presented at this meeting. The cells isolated from rabbit bone marrow are postulated to possess unique phenotypic and functional characteristics of mesenchymal stem cells such as adherence to plastic and ability to differentiate along mesenchymal lineages. The results from our study will allow future therapeutic applications using MSCs to be developed which include the healing of mesenchymal tissue injuries and connective tissue regeneration requiring autologous tissue transplantation.