

Cryopreservation effect on the expression of DNA methylation genes in Wharton's jelly derived mesenchymal stem cells

ABSTRACT

Mesenchymal stem cells (MSCs) derived from Wharton's jelly (WJ) has become an alternative source to obtain MSCs for clinical application. This is due to less ethical concerns and invasive procedures compared to embryonic and bone marrow stem cells. To ensure plentiful supply, cryopreservation is commonly used to preserve the cell viability. However, this technique may affect the characteristics and epigenetic regulation of these cells. In this study, we investigate how cryopreservation affects genes associated with stemness, differentiation and epigenetic control. Firstly, the cell morphology and proliferation were examined under light microscope and trypan blue exclusion, respectively. Then, gene expression study was performed using RT-PCR. WJMSCs were cultured at passage 6 and 9 and cryopreserved for 2 week and 6 months. Our results showed no much change on their fibroblast-like morphology and proliferation capacity. In contrast, genes modulated the characteristics of MSCs such as NANOG, RUNX2, OCN and DNA methylation were altered after cryopreservation. In addition to other previous studies, this study has shed light on potential implications of cryopreservation on the epigenetic regulation of WJMSCs.