GENETICS AND GENODERMATOSES

COMPARISON OF PHENOTYPES AND TRANSCRIPTOMES OF MOUSE SKIN-DERIVED PRECURSORS AND DERMAL MESENCHYMAL STEM CELLS

Yiming Li [(1)] - Lidan Xiong [(1)] - Jie Tang [(1)] - Li Li [(1)]

Huaxi Hospital, Dermatology And Venerology, Chengdu, China [(1)]

Background/Introduction: Skin-derived precursors (SKPs) have been regarded as promising in differentiation potential and cell replacement therapy. Another type of stem cells derived from the dermis, dermal mesenchymal stem cells (DMSCs) have been extensively applied in basic and clinical research. But the comparison of SKPs and DMSCs concerning their biological characteristics, especially transcriptome ones, has never been reported.

Objective: To compare the biological especially transcriptome characteristics of mSKPs and mouse DMSCs.

Materials and Methods: Isolation and cell culture for mSKPs and mouse DMSCs were committed. Cell cycle analysis, immunocytochemistry assay for stem cell markers, CD antigen expression, induced differentiation were employed to characterize and compare mSKPs and DMSCs. mSKPs' and DMSCs' transcriptome profiles were analyzed by RNA-sequencing (RNA-Seq) and verified by qRT-PCR.

Results: mSKPs and DMSCs shared similar cell cycle pattern, CD antigen expression. Both mSKPs and DMSCs expressed α-SMA, Nestin, Sox2, Ssea4, Versican, Vimentin; only mSKPs expressed Nanog and Oct4; only DMSCs expressed Collagen I; neither of the cells expressed Pck or Vwf. Both mSKPs and DMSCs had the capacity of osteogenic, adipogenic, chondrogenic, and Schwann cell-genic induced differentiation. RNA-Seq and qRT-PCR indicated that the differentially expressed genes (DEGs) in mSKPs were enriched in immune-related pathways, and the up-regulated gene ontology terms (GO terms) were also immune-related. DEGs in DMSCs were enriched in differentiation/development/disease-related pathways, and the up-regulated gene ontology terms (GO terms) were also relevantly related.

Conclusions: mSKPs and DMSCs shared similarities in certain biological characteristics. They were different in certain stem cell marker antigen expression. They also had distinct transcriptome profiles. DEGs in mSKPs were enriched in immune-related pathways,

indicating the possible application in anti-UVB radiation damage. DEGs in DMSCs were enriched in physiology or pathology-related pathways, indicating the potential application in differentiation, development, and relevant diseases.