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Expression of pluripotency associated genes in human mesenchymal stem cells derived from umbilical cord and adipose tissue

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Human umbilical cord and adipose tissue are among the richest sources of mesenchymal stem cells (MSCs) with great promises in the field of regenerative medicine. Regardless of the intensive investigations of human MSCs from different tissues, the molecular mechanisms regulating the undifferentiated state and differentiation abilities are still unclear. The transcription factors OCT4, NANOG and SOX2 that are crucial for the efficient maintenance of the fine balance between self-renewal and differentiation in embryonic stem cells have been suggested to play a similar role also in mesenchymal stem cells. In the present work, the expression evaluation of OCT4A, OCT4B and OCT4B1 splice variants, NANOG and SOX2 were performed in MSC isolated from umbilical cord (UC), and adipose tissue (AT). UC-MSC displayed lower population doubling time than AT-MSC, (30.8±5h, 54.9±5h, respectively). Both cell types expressed the pluripotent markers OCT4A, NANOG and SOX2. The mRNA levels of OCT4B and NANOG were significantly higher in AT-MSC than UC-MSC ($p<0.05$). In addition, AT-MSC from different patients showed increased heterogeneity in mRNA levels of all analyzed genes compared to UC-MSC. In conclusion, higher expression of NANOG and OCT4B is not associated with better proliferative potential of AT-MSC. The UC-MSC from different samples showed lower variation in mRNA levels of OCT4A, OCT4B, OCT4B1, NANOG and SOX2 than AT-MSC, that make them a more appropriate candidate for clinical trials.

Biography

E Stoyanova pursued her PhD (2015) from the Institute of Biology and Immunology of Reproduction (IBIR) at the Bulgarian Academy of Sciences, Bulgaria. Currently, she is a Posdoctoral Researcher in the Department of Molecular biology at the same institute. Her research interests focuses on reprogramming of human soamtic cells, mesenchymal stem cells derived from bone marrow, adipose tissue, umbilical cord and cancer cells.

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