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POSTER ABSTRACTS

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immortalized mesenchymal stem cell line from rat bone marrow by transfection with human telomerase reverse transcriptase (hTERT) gene.
Methods: MSCs were isolated from bone marrow according to their plastic adherence characteristics. The cells were then trasfected with a Lentiviral vector containing hTERT and GFP genes. Telomerase-expressing, GFP positive MSCs were sorted by anti GFP antibody using a flow cytometer. Expression of hTERT gene and telomerase activity has been confirmed by RT- PCR and Telomerase Repeat Amplification Protocol (TRAP) respectively in transfected cells. The cells were investigated in terms of their karyotype. We also studied biological characteristics of transfected cells including the expression of MSC surface markers, their proliferation capacity and differentiation potential toward mesodermal lineage.
Results: According to our findings transfected cells sustained their normal morphology and karyotype after transfection. The cells expressed MSC markers including CD44, CD90, CD73, CD 105 and did not expressed non-mesenchymal markers including CD45, CD34, and CD11b. Transfected cells showed strong proliferation capacity. Based on our data, GFP-positive telomerase expressing cells maintained their self-renewal and differentiation potential into osteocytic, chondrocytic and adipose cell lineages after 40 passages.
Conclusion: In conclusion, over expression of telomerase in rat BM-MSCs overcome the problem of limited expansion capabilities of MSCs due to cellular senescence. GFP- telomerase positive immortalized rBM-MSC line which sustained their immunophenotyping, normal karyotyping, self-renewal and differentiation potential into mesodermal lineage after 40 passages could be a promising tool for preclinical studies.

T-3036

ISSUES DISTANCE STEM CELL RESEARCH ACHIEVEMENTS FROM BEING APPLIED IN TRANSLATIONAL MEDICINE: A QUALITATIVE STUDY FROM IRAN

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Introduction: According to the National Institute of Health (NIH) it is estimated that 80 to 90 percent of potential therapeutics in preclinical testing runs into obstacles that prevent them from being translated to the clinical phase. One of the main reasons is difficulties in developing and sustaining collaborations between basic scientists and clinicians. Translational research based on stem cell therapy, by its nature, crosses boundaries between basic science and clinical application. Crossing these boundaries contributes directly to overcoming challenges to engage basic scientists working on stem cell science in clinical research and practice. The aim of this qualitative study was to identify obstacles in application of basic stem cell science discoveries in opinion of Iranian scientists and clinicians.
Materials and Methods: Sixteen experts in stem cell science and/or specialists in different clinical fields, working as distinguished academic members at universities and research centers of Mashhad, Northeastern Iran, were selected by purposive sampling method. Each deep interview was recorded with the permission of the interviewee and converted to text. Thematic analysis with open coding was done using MAXQDA ver. 10 software and axial codes were classified based on factors related to Inefficiencies of basic stem cell researches.

Results and Conclusion: A content analysis identified eight themes and 21 subthemes that described the participants' opinions on the major drawbacks of translational medicine in Iran. The major themes were: insufficiency of clinical trials regarding stem cells; unidentified ethical and legal concerns in different steps of translation; poor level of understanding each other between basic scientists and clinicians or lack of common language between them; differences between their professional environments, and heterogeneous areas of expertise; and different end-points in their work. This creates considerable problems of communication.
We also discuss here the possible ways to overcome the obstacles by providing suggestions that may enable this collaboration and highlight strategies to improve the effective communication. Some of them are as below: governmental research investments and academic and industrial grants should involve both groups in benefits and responsibilities of translational research and must be increased in amount; it is recommended to admit medical students who have B.Sc. degree, as this is considered as the golden period to lay the basis for knowledge based researches and that the efforts to entice admitted medical students and residents to do research are too little too late and should be up scaled; more emphasize and priorities should be allocated to MD/PhD programs to fill the gap of understanding; in certain fields the regular MD/PhD trend could be reversed by introducing of PhD/MD or encouraging physicians with different specialties to enroll PhD degree or fellowship programs for cell therapy. Some other suggestions in the article include ways for elimination of the barriers exists in translational research. It is regarded as a starting point to encourage debate on this issue.

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THERAUTIC EFFECTS OF TIME WINDOW FOR HUMAN UMBILICAL CORD BLOOD-DERIVED MESENCHYMAL STEM CELLS WITH METHYLPREDISOLONE TREATMENT IN THE CONTUSED RAT SPINAL CORD

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Therapeutic effects of time window for human umbilical cord blood-derived mesenchymal stem cells with methylprednisolone treatment in the contused rat spinal cord

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Abstract
Methylprednisolone (MP), a glucocorticoid steroid, has an anti-inflammatory action and seems to inhibit the formation of oxygen free radicals produced during lipid peroxidation in a spinal cord injury (SCI). Currently MP is the standard therapy after acute SCI on reported neurological improvements. The combination therapeutic effect of human umbilical cord blood-derived mesenchymal stem cells (hUCB-MSCs) for transplantation time (1d, 7d, and 30d) after MP treatment on the axonal regeneration and on the behavioral improvement in SCI were studied in the rat. The spinal cord was injured by contusion using a weight-drop at the level of T9 and MP (30 mg/kg, i.m., 10 min and 4 h) was acute administered after injury. hUCB-MSCs were labeled GFP and our study was performed the efficacy for transplantation time (1d, 7d, and 30d) of hUCB-MSCs into the boundary zone of injured site. Efficacy was determined by histology, anterograde and retrograde tracing, and behavioral test. We found that hUCB-MSCs with MP treatment exerted a significant beneficial effect by neuroprotection and reducing cavity volume. Also the transplantation of hUCB-MSCs with MP treatment was significantly improved functional recovery. Combined transplantation at 7d after SCI provided significantly greater efficiency than combined transplantation at 1d and 30d. These results suggest that transplantation time window of the hUCB-MSCs with MP treatment give rise to an earlier neuron protection strategy and effect of cell grafting in SCI. Thus our study may be considered as a therapeutic modality for SCI.

Mesenchymal Cell Lineage Analysis

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