

International Conference and Exhibition on **Cosmetic Dermatology & Hair Care** December 07-08, 2015 Philadelphia, USA

Evaluating the proliferation potential of human hair follicle mesenchymal stem cells in presence of some growth factors and herbal extracts before differentiation

Fatemeh Salehinia, Hamidreza Ahmadi Ashtiani, Abdol-Amir Allameh and Reza Haji Hosseini

Payam Noor University, Iran

Azad University, Iran

Tarbiat Modarres University, Iran

Payam Noor University, Iran

Epithelial's stem cells are located in histological area called bulge in the middle part of hair follicle between arrector pili muscle and sebaceous gland which their potential to differentiate to variety of cells such as chondrocytes, osteoblasts, adipocytes, melanocytes, etc., is confirmed via several researches; as well as there is non-invasive method to extract hair follicle to culture organ for isolation of its stem cells, regarding the effect of some ingredients such as different herbal extracts and growth factors on aforementioned stem cells proliferation makes them suitable for tissue engineering. If these cells keep their proliferation potential in presence of such ingredients it can be a step to use them instead of other mesenchymal stem cells derived from adipose tissue or bone marrow to supply the required cells in scalp and skin area as well as in medical cell therapy; in this research the potential of proliferation of human hair follicle mesenchymal stem cells (hHFMSCs) is evaluated before differentiation in presence of several compounds. Some hair follicle cultured for 7 days after isolation from the scalp of 3 men with average age of 35 years; the wells populated with cells which had the morphological appearance of mesenchymal cells thus they were selected and pooled after survey on their superficial markers via flow cytometry and their mesenchymal nature was approved; also their potential for differentiation to osteoblasts and adipocytes approved by real-time RT-PCR., then expanded for 7 days in 8 distinct groups in 24-well culture plates with stromal medium culture containing 10% FBS, the first group supplemented with 1 ng/ml EGF, 1 ng/ml bFGF and 1 ng/ml aFGF, second group supplemented with 1.5% aqueous extract of leaf of *Rosmarinus officinalis*, third group supplemented with 1.5% of aqueous extract of root of *Althaea officinalis*, the fourth and fifth groups supplemented like the second and third groups but 3% of abovementioned extracts, the sixth group considered as the negative control, the seventh group considered as the positive control 1 with 1.5% aqueous extract of *Rosmarinus officinalis* plus 1.5% aqueous extract of *Althaea officinalis* besides growth factors with the same concentration to group 1, the eighth group considered as the positive control 2 with 3% aqueous extract of *Rosmarinus officinalis* plus 3% aqueous extract of *Althaea officinalis* besides growth factors with the same concentration to group 1; the cells proliferation potential evaluated by BRDU Assay. The comparison of results showed that the rate of cell proliferation in first group was more than other, then the seventh and next was the eighth group then in order, fifth, third, second, fourth group and eventually the negative control. This study showed that aqueous *Rosmarinus officinalis* extracts may be able to regulate the out of control proliferation of MSCs which is very important to prevent scar and cheloide formation while using growth factors for wound healing.

Key words: Mesenchymal stem cells, Human hair follicle, BRDU Assay, Wound healing, Scar.

ats_salehi@yahoo.com

Notes: