

Effect of Retinoic acid on viability and neural differentiation of mouse hair follicle stem cells

Abstract

Objective: Nowadays studies have focused on stem cell biology and it is hoped that the results of this research have an important role in the treatment of many diseases are incurable. Adult stem cells can be derived from many adult tissue sources. In this study we used Bulge region of mouse hair follicle because, it is containing a high proliferative potential and easy accessibility sources of stem cells, to investigate neural differentiation of this cells. Different methods was used to induction of neural differentiation on Stem cells. In this study we conducted to isolate and culture of the bulge cells from mouse hair follicles and treatment with retinoic acid to determine its effects on neural differentiation and proliferation of bulge stem cells.

Material and Methodes : The bulge region of mouse whiskers was isolated and cultured in DMEM/F12 supplemented with EGF, Cholera toxin and FGF-2. Cytotoxic effects of *all-trans* retinoic acid (RA) were evaluated using 3-(4, 5-Dimethylthiazol-2-yl)-2, 5 diphenyltetrazolium bromide (MTT). In the present study, characterization of neural and glial cells derived from HFSCs was performed by means of phase-contrast microscope and RT-PCR analysis.

Results: Our results showed that undifferentiated HFSCs expressed nestin and CD34 stemness genes, the neural like cells derived from HFSCs expressed MAP2, also in RA treated cells, GFAP did not expressed. In addition, RA (1 μ M) was promoted neurogenesis, that instead increasing RA concentration showed pronounced cell death. we studied the expression of Bcl2 and Bax in this cells to investigate the effect of Retinoic acid on proliferation and Apoptosis. Our results showed that Retinoic acid can improve proliferation in comparison with Apoptosis in this stem cells.

Conclusion: Our findings indicated that nestin and CD34 expressing cells in the bulge of the hair follicle have stem cell-like properties and can effectively generate cells of neural lineage in the presence of RA(1 μ M). These data should be an important tool for the treatment of a variety of neurodegenerative diseases.

Key words: Retinoic acid - Bulge area - Hair follicle - Stem cell - Neuron- Glial Apoptosis - Differentiation