J Tissue Sci Eng 2017, 8:4(Suppl)
DOI: 10.4172/2157-7552-C1-040

Reprogramming monocytes into retinal cells and its *in vivo* characterization for vision rescue in mouse model of retinitis pigmentosa

Alaknanada Mishra[1], Madhu Nath[2], Srikanth Iyer[1], Jashdeep Bhattacharjee[1], Barun Das[1], Nagarajan Perumal[1] and **Pramod Upadhyay[1]**
[1]National Institute of Immunology, India
[2]All India Institute of Medical Sciences, India

Retinitis pigmentosa (RP) is one of the most common retinal degeneration disease which causes partial or complete loss of vision. Inspite of various ongoing studies, there is no cure for RP till date. Therefore, the purpose of our study was to identify an abundantly and easily available source of cells which could be reprogrammed into retinal cells. Monocytes are terminally differentiated cells but they possess extreme plasticity to mould into a lineage when provided with proper extrinsic microenvironment. Following the same, we restructured the differentiation of monocytes in a two-step approach where peripheral blood derived monocytes were de-differentiated into reprogrammed monocytes and further re-differentiated into retinal cells. These cells were further transplanted in a *pde6b* rd1 mouse model and analysed for vision rescue. *In vitro* characterization ensured that these re-differentiated retinal cells possessed molecular and immunophenotypic properties like retinal cells. The transplantation results suggested decent engraftment of these cells in retina of rd1 mice and even though there was only a slight preservation (15-20%) of photoreceptor cells (a wave), the other retinal cell types that suffered apoptosis during retinitis pigmentosa were significantly rescued (b wave). This indicated that the monocyte derived re-differentiated retinal cells were functionally active and could achieve delay of retinal degeneration during retinitis pigmentosa.

alaknanda16@nii.ac.in