

In vitro trans Differentiation of Human Umbilical Cord Mesenchymal Stem Cells (hUC-MSC) into Corneal/ Limbal Epithelial Cells

Santhosh Kacham^{1*}, Sachin Shukla² and Sreenivasa Rao Parcha¹

¹Stem cell laboratory, Department of Biotechnology, National Institute of Technology, India

²Brien Holden Eye Research Centre, LV Prasad Eye Institute, India

Bilateral limbal stem cell deficiency is the disease caused by loss of limbal stem cells in both the eyes. The treatment for it includes transplanting the cultured cells from the allogenic donor which is having drawbacks of graft rejection and continuous use of antibiotics for long term. The other ways includes differentiation of the oral mucosal epithelial cells, induced pluripotent stem cells or Mesenchymal Stem Cells (MSCs) like adipose stem cells, bone marrow stem cells, and dental pulp stem cells into limbal stem cells. These all cells having disadvantage that cell yield depends on donor age and the procedure is invasive. Other choice of cells which are largely abundant and the procedure is noninvasive are human Umbilical Cord Mesenchymal Stem Cells (hUC-MSC). The objective of the paper includes characterization of hUC-MSCs, checking their inherent property to differentiate into corneal/limbal epithelium and stimulating them to transdifferentiate into corneal/limbal epithelium. The hUC-MSCs were positive for MSC markers CD73, CD90, CD105, and vimentin. The cells are also expressing the Pax-6, Wnt7a, CK-8/18 but not CK-3/12 which is specific to corneal epithelium. After conditioned media treatment the hUC-MSCs are changed their morphology and also expressed corneal epithelial specific marker CK-3. The hUC-MSCs inherently possess few characteristics of corneal epithelial cells and by using conditioned media we can transdifferentiate them into corneal epithelial cells *in vitro*.

Biography:

Santhosh Kacham (Reg No.714046) doing his Ph.D in National institute of Technology (NIT), Warangal under the guidance of Associate Professor Dr. P. Sreenivasa Rao. His research is on labeling the limbal stem cells and exploring the human Umbilical Cord Mesenchymal Stem Cells as a cell source for the treatment of bilateral limbal stem cell deficiency. He had 3 international publications (1 review article and 2 research articles). He had cleared national level exams Graduate Aptitude Test in Engineering (GATE) and Council for Scientific and Industrial Research (CSIR) during my graduation.