

5th International Conference on

Tissue Engineering & Regenerative Medicine

September 12-14, 2016 Berlin, Germany

Disease modeling of systemic sclerosis disease through iPS induction and differentiation

Zahra Mazidi¹, Mehdi Tootoonchi¹, Hossein Baharvand and Nasser Aghdami¹

Royan Institute for Stem Cell Biology and Technology, Iran

Systemic sclerosis is associated by immunological abnormalities, vascular injury and fibrosis. Vascular alteration can be considered as first signs of its appearance. Therefore finding out its mechanism is one aspect of disease progression study. Isolation of endothelial cells from patients are not always possible, substantially Stem cell therapy represents a hope for differentiation study based on ability of ESC and iPS cells in differentiation. So Isolated fibroblast from systemic sclerosis patients were induced toward pluripotency and characterized. Then these induced pluripotent stem cells(iPS) beside iPS derived from normal fibroblasts were treated with CHIR99021,BMP4,VEGF-A,Purmorphamine and SB431542 for endothelial progenitor cells(epc) differentiation that VEGFR2 was expressed 12 fold more than Royan iPS4 and flowcytometry analysis showed that 30% of the cells were VEGFR2 positive. Then cells were sorted based on VEGFR2 expression and cultured on collagen type I for maturation. Flowcytometry analysis showed maximum 85% of cells (normal and patients) were CD31 positive and 95%VWF positive and absorbed LDL uptake. But endothelial cells form patients' iPSC (SSC-ECs) showed significant different expression of Vecadherin(20%) while its expression was about 90% in normal cells. SSC-ECs could not form tube structures *in vitro* in spite of normal derived endothelial cells. Overall, in this project for the first time we were successful to derive endothelial cells from human pluripotent stem using this cocktail of small molecules with high efficacy. Also we showed iPS cells from normal fibroblasts have different endothelial differentiation potential compared to systemic sclerosis derived cells due to their angiogenesis characteristics such as Vecadherin expression and tube formation which could be an important step in scleroderma progression study.

Biography

Zahra has completed her Master from Royan Institute of Stem Cell and Development. She is currently a researcher in cardiovascular group, Tissue Engineering and Bioprocess group of Royan Insitute. She is involved in several projects such as "large-scale production of human endothelial cells", "Recellularization of Heart valve for therapeutic applications". She is also working as International Business Manager of CellTech Pharmed company as a pioneer in Regenerative medicine field.

zmazidi_2007@yahoo.com

Notes: