P52 - GLIMPSE INTO CELL REPROGRAMMING: EMERGING ROLE OF PROGESTERONE RECEPTOR IN PRIMING POTENCY OF INDUCED PLURIPOTENT STEM CELLS (iPSCs)

Michele Manganelli [1] - Mattia Bugatti [2] - Rosalba Monica Ferraro [1] - Elena Laura Mazzoldi [1] - Marta Parigi [1] - Ginetta Collo [3] - Gabriele Stocco [4] -William Vermi [5] -Luigi Mori [6] -Silvia Giliani [1]

University of Brescia, "Angelo Nocivelli" Institute for Molecular Medicine, Department of Molecular and Translational Medicine, ASST Spedali Civili di Brescia, Brescia, Italia [1] - University of Brescia, ASST Spedali Civili di Brescia, Brescia, Italia [2] - University of Brescia, Department of Molecular and Translational Medicine, Division of Farmacology, Brescia, Italia [3] - University of Trieste, Department of Life Sciences, Trieste, Italia [4] - University of Brescia, Department of Molecular and Translational Medicine, ASST Spedali Civili di Brescia, Brescia, Italia [5] - University of Brescia, Department of Clinical and Experimental Sciences, Brescia, Italia [6]

Reprogramming technologies enable cells to enter an embryonic pluripotent stem cell (ESC)-like state, resulting in the generation of Induced Pluripotent stem cells (iPSCs). iPSCs share many key properties with ESCs as pluripotency, self-renewal, embryoid bodies (EBs) formation and similar gene expression profile. Steroids hormone-related receptors as estrogen (ERα) and progesterone receptor (PR) are expressed in blastocyst. In particular, progesterone is essential for the differentiation of ESCs during human embryonic development. Interestingly, the DNA-repair tumor suppressor protein BRCA1 interacts with and regulates ERα and PR transcriptional activation. We explored the expression pattern of ERα and PR in iPSCs generated with four different independent reprogramming methods (Episomal-vector, Sendai-virus, Retrovirus and Lentivirus) from cord blood-derived CD34+ progenitors and skin fibroblasts, and corresponding EBs. As assessed by real-time PCR (qPCR), ERα and PR mRNA were low expressed in the iPSCs cells, showing expression downregulation ($p<0.001$) during EBs differentiation into the three embryonic germ layers (PAX6: ectoderm, α-SMA: mesoderm and GATA4: endoderm). Immunofluorescence (IF) staining did not detect ERα protein in iPSCs. On the other hand, we detected the expression of PR protein in the nucleous of all the different iPSCs. To further confirm these results, immunohistochemistry (IHC) staining did not detect the expression of ERα protein in corresponding EBs. Conversely, IHC strongly highlighted the expression of PR protein in the nucleous of the different EBs until 8 days. This is the first report demonstrating the presence of PR in iPSCs, underling their close relation to ESCs, and suggesting a possible role of PR in priming pluripotency, a state that immediately precedes germ layer specification and differentiation.