12.04.2011 M. Manukyan "HP1 mobility as a measure of reprogramming"

Abstract

Our aim is to study the chromatin dynamics of key epigenetic regulators during induction of iPS cells from somatic cells. We introduce constructs expressing non-histone chromatin proteins of the HP1 class into primary human fibroblasts and adipose-derived mesenchymal stem cells. Live FRAP is performed to measure the dynamics of HP1 proteins in somatic and multipotent cells. The "pluripotency factors" (*Oct4, Sox2, Klf4, c-Myc*) will then, in turn, be introduced into these cells to initiate their reprogramming to iPS cells. Subsequently FRAP will be undertaken at various days after initiation of reprogramming to measure the dynamics of HP1 proteins. These studies will determine, by FRAP recovery, changes in the binding capacity of the above proteins for chromatin during reprogramming as compared to the originating fibroblasts and authentic pluripotent human ES (hES) cells. A comparison of the mobility of key epigenetic regulators in iPS cells to that mobility found in pluripotent hES cells will be used as a measure of the degree of reprogramming achieved during the reprogramming process.