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Importance of Myc-related microRNAs in induced pluripotency

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Pluripotent stem cells (PSCs) have the capacity to differentiate into any cell type of the body. Therefore, induced pluripotent stem cells (iPSCs) are seen as a promising solution for patient-specific cell therapies. However, the safety is major issue for *in vitro* methods that are used in induction of pluripotency and also in differentiation of PSCs toward specific cell types. In pioneer studies of iPSC generation, the role of c-Myc has been highlighted as a possible master regulator of pluripotency, but direct c-Myc overexpression is known to prompt drawbacks, especially in human cells. In recent studies, the role of non-protein coding RNA molecules such as microRNAs (miRNAs) has been shown in enhanced reprogramming efficiency. In addition, new reprogramming methods have been ultimately improved by adding miRNAs, in the absence of previous factors. Cross interaction between miRNAs and c-Myc has been also found in differentiation of iPSCs, as well as in reprogramming and self-renewing the pluripotent state. Thence, miRNAs are promising solution for efficiency and safety of iPSC derivation and differentiation methods. The purpose of the present review is to evaluate interaction mechanisms of miRNAs with c-Myc and in iPSC technology.

Biography

E Sacide Caglayan has completed her PhD on Medical Genetics in Afyonkocatepe University in 2010 and worked as a Visiting Scholar on induction of pluripotency from fibroblasts by using microRNAs in Ruohola-Baker Lab, Institute of Stem Cell and Regenerative Medicine in University of Washington. Presently, she is working as an Assistant Professor in Health Science Faculty, Yildirim Beyazit University, Turkey.

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