

Progress in understanding reprogramming to the induced pluripotent state.

Journal: Nat Rev Genet

Publication Year: 2011

Authors: Kathrin Plath, William E Lowry

PubMed link: 21415849

Funding Grants: In vitro reprogramming of mouse and human somatic cells to an embryonic state

Public Summary:

Induction of pluripotency by transcription factors has become a commonplace method to produce pluripotent stem cells. Great strides have been made in our understanding of the mechanism by which this occurs--particularly in terms of transcriptional and chromatin-based events--yet only a small part of the complete picture has been revealed. Understanding the mechanism of reprogramming to pluripotency will have important implications for improving the efficiency and quality of reprogramming and advancing therapeutic application of induced pluripotent stem cells. It will also help to reveal the machinery that stabilizes cell identity and to instruct the design of directed differentiation or lineage switching strategies. To inform the next phase in understanding reprogramming, we review the latest findings, highlight ongoing debates and outline future challenges.

Scientific Abstract:

Induction of pluripotency by transcription factors has become a commonplace method to produce pluripotent stem cells. Great strides have been made in our understanding of the mechanism by which this occurs--particularly in terms of transcriptional and chromatin-based events--yet only a small part of the complete picture has been revealed. Understanding the mechanism of reprogramming to pluripotency will have important implications for improving the efficiency and quality of reprogramming and advancing therapeutic application of induced pluripotent stem cells. It will also help to reveal the machinery that stabilizes cell identity and to instruct the design of directed differentiation or lineage switching strategies. To inform the next phase in understanding reprogramming, we review the latest findings, highlight ongoing debates and outline future challenges.

Source URL: <https://www.cirm.ca.gov/about-cirm/publications/progress-understanding-reprogramming-induced-pluripotent-state>