

Conversion of mouse fibroblasts into cardiomyocytes using a direct reprogramming strategy.

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Public Summary:

Here we show that conventional reprogramming towards pluripotency through overexpression of Oct4, Sox2, Klf4 and c-Myc can be shortcut and directed towards cardiogenesis in a fast and efficient manner. With as little as 4 days of transgenic expression of these factors, mouse embryonic fibroblasts (MEFs) can be directly reprogrammed to spontaneously contracting patches of differentiated cardiomyocytes over a period of 11-12 days. Several lines of evidence suggest that a pluripotent intermediate is not involved. Our method represents a unique strategy that allows a transient, plastic developmental state established early in reprogramming to effectively function as a cellular transdifferentiation platform, the use of which could extend beyond cardiogenesis. Our study has potentially wide-ranging implications for induced pluripotent stem cell (iPSC)-factor-based reprogramming and broadens the existing paradigm.

Scientific Abstract:

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