

Direct reprogramming of human cardiac fibroblasts towards the cardiac phenotype through non-viral approaches.

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Myocardial infarction (MI) is the leading cause of mortality worldwide. Direct reprogramming of cardiac fibroblasts into induced cardiomyocytes (iCMs) represents a new promising strategy for cardiac regeneration [1]. In this work, we demonstrated that non-viral transient transfection of human adult cardiac fibroblasts (AHCFs) with four miRNAs (miRcombo: miR-1, 133, 208, 499 [2]) is able to reprogram AHCFs into iCMs, and reprogramming efficiency is further enhanced by a 3D culture environment. Novel lipoplexes were also designed for safer and efficient miRNA delivery [3,4].

This project received funding from the European Research Council under the European Union's Horizon 2020 research and innovation programme grant agreement N°-772168.

[1] Paoletti et al. *Cells* 2018.

[2] Paoletti et al. *Front. Bioeng. Biotechnol.* 2020.

[3] Lee & Paoletti et al. *J. Cont. Rel.* 2019.

[4] Arpicco et al. *Farmaco* 2004.