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Title: From fetus towards adult : maturation and functional analysis of pluripotent stem cell-derived cardiomyocytes

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From Fetus towards Adult

Maturation and functional analysis of pluripotent stem cell-derived cardiomyocytes

1. Maturation of human pluripotent stem cell derived cardiomyocytes can be induced *in vitro*. (*this thesis*)
2. Maturation of cells, as in people, is a complex trait as it is unlikely to be controlled by a single master pathway. Thus, to achieve a better maturation status of the hPSC-CMs, it is necessary to expose the cells to multiple regulatory cues simultaneously. (Yang X *et.al.* 2014 *Circ Res*; 114(3):511-23)
3. Increased maturation of human pluripotent stem cell-derived cardiomyocytes is pivotal for their use in disease modeling (*this thesis*)
4. 3-D cell culture systems can enable the recreation of realistic human tissue architecture *in vitro* and promote structural and functional maturation of both cardiomyocytes and non-myocytes in a developmentally mimetic fashion. (Bian W. *et.al.* *Biomaterials*, 2014; 35(12):3819–28)
5. Live sarcomere assessment with the use of fluorescent reporters has the potential to change the way cardiomyocyte maturation and cardiomyopathy modeling is studied *in vitro*. (*this thesis*)
6. The Myosin Binding Protein C plays a crucial role in sarcomeric function of human pluripotent stem cell-derived cardiomyocytes *in vitro*. (*this thesis*)
7. Myosin Binding Protein C acts as an internal load that tethers myosin heads to the thick-filament backbone and prevents force generation in diastole. (Pohlmann L. *et.al.* *Circ Res*. 2007;101(9):928-938)
8. Simultaneous measurement of different biophysical parameters in cardiac cells or tissues should reveal their functional inter-regulatory dependence.
9. Concerted FGF and BMP signaling control the transition from a multipotent cardiac progenitor cells to a ventricular- specified cardiac progenitor. (*this thesis*)
10. Ultimately the best model of a human heart is the heart itself.
11. The person able to see furthest is the one able to look through everyone's eyes and understand their perspective on reality.
12. Do not regret the mistakes you have made...regret the ones you have not tried. (*Unknown*)
13. The true sign of intelligence is not knowledge but imagination. (Albert Einstein (1879-1955))