

Heart regeneration: hopes and pitfalls

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The primary cause of decreased heart function is often an incident resulting in the loss of cardiomyocytes; such as myocardial infarction. Despite great achievements in reducing acute mortality of myocardial infarction the prevalence of heart failure is continuously increasing presenting a major socio-economic burden. Thus, there is a great need for novel therapies that can reverse damage inflicted to the heart. Three major strategies to regenerate a damaged heart have been explored extensively during the last few decades: induction of cardiomyocyte proliferation, utilization of stem cells, and cardiac tissue engineering. Yet, none of these strategies has been translated into medical practice and controversies regarding the validity of several studies have emerged. A main reason for these controversies is our limited knowledge of the cell biology of cardiomyocytes. This presentation will give a short overview of recent advancements in heart regeneration including xenotransplantation and discuss the current issues of the three major strategies. Finally, an insight in our research on 3D printing of cardiac tissue as well as cardiomyocyte proliferation will be provided.