

New Insights and Implications for Regenerative Medicine from Cardiomyocyte Maturation

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Introduction

The heart is made of four cell types (cardiomyocyte, fibroblast, endothelial cell, and pericyte). Cardiomyocytes are the primary contractile cells. Fibroblasts, endothelial cells, and pericytes are non-contractile cells that support the function of cardiomyocytes. The electrical activity of cardiomyocytes is coordinated by gap junctions between adjacent cells. Calcium ions play a central role in the regulation of cardiomyocyte function. Calcium ions are released from the sarcoplasmic reticulum and bind to troponin, which initiates contraction. The release of calcium ions is regulated by the ryanodine receptor (RyR) and the dihydropyridine receptor (DHPR). The release of calcium ions is also regulated by the inositol trisphosphate receptor (IP3R). The release of calcium ions is also regulated by the ryanodine receptor (RyR) and the dihydropyridine receptor (DHPR). The release of calcium ions is also regulated by the inositol trisphosphate receptor (IP3R). The release of calcium ions is also regulated by the ryanodine receptor (RyR) and the dihydropyridine receptor (DHPR). The release of calcium ions is also regulated by the inositol trisphosphate receptor (IP3R).

Change in intracellular calcium is induced by Ca²⁺ binding to troponin and by the release of calcium from the sarcoplasmic reticulum. The release of calcium from the sarcoplasmic reticulum is regulated by the ryanodine receptor (RyR) and the dihydropyridine receptor (DHPR). The release of calcium from the sarcoplasmic reticulum is also regulated by the inositol trisphosphate receptor (IP3R). The release of calcium from the sarcoplasmic reticulum is also regulated by the ryanodine receptor (RyR) and the dihydropyridine receptor (DHPR). The release of calcium from the sarcoplasmic reticulum is also regulated by the inositol trisphosphate receptor (IP3R).

One of the major challenges in regenerative medicine is the need to generate functional cardiomyocytes. The generation of functional cardiomyocytes is a complex process that involves the differentiation of stem cells into cardiomyocytes. The generation of functional cardiomyocytes is also regulated by the ryanodine receptor (RyR) and the dihydropyridine receptor (DHPR). The generation of functional cardiomyocytes is also regulated by the inositol trisphosphate receptor (IP3R). The generation of functional cardiomyocytes is also regulated by the ryanodine receptor (RyR) and the dihydropyridine receptor (DHPR). The generation of functional cardiomyocytes is also regulated by the inositol trisphosphate receptor (IP3R).

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