Sex-Chromosomal verified differentiation from human glandular stem cells to cardiomyocyte-like Cells in co-culture with human myocardial biopsies

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Background:

Human adult pancreatic (parotic) stem cells were brought in a co-culture with human myocardium. The origin of the resulting troponin-I-positive cardiomyocyte-like cells was considered as unclear. Were they derive from: adult stem cells or the added myocardium? To clarify their origin, sex-chromosomal analyses were to perform.

Material and Methods:

Male adult stem cells were harvested from pancreatic (parotic) tissue of patients undergoing operative procedures due to pancreatic (parotic) but not malignant diseases of female patients (n=6). The cells were selected, cultured and passaged. Simultaneously with a troponin-I-staining, a Fluorescence In Situ Hybridization (FISH) is performed to evaluate the X and Y chromosome signals present in each cell. Human myocardial biopsies for co-cultures were taken from female patients.

Results:

We could show by simultaneously applied immunocytochemistry for troponin-I and FISH that human adult stem cells from pancreas and parotis with a positive immunocytochemistry for troponin-I differentiated into cardiomyocyte-like cells which were male (XY) likewise the applied glandular stem cells.

Conclusion:

The differentiation of human adult pancreatic and parotic stem cells enhanced by a cardiomyocyte coculture is reliably proven now. These glandular stem cells might become a clinically relevant autologous source of regenerative tissue for the repair of irreversible damaged myocardium.