Ottava Giornata della Ricerca della Svizzera Italiana
Venerdì 9 marzo 2018

Modulo per la sottomissione abstract ricerca di LABORATORIO

Titolo (massimo **15 parole**)

Generation of iPSC from human adult progenitor cells: reprogramming efficiency and cardiac differentiation potential

Autori (cognome e iniziali, es: Grassi L.)

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Testo (massimo **250 parole**, preferibilmente in italiano (accettato anche in inglese), suddiviso in Introduzione, ***Metodi***, ***Risultati***, ***Conclusioni*** e ***Finanziamento***

Introduction: Induced pluripotent stem cells (iPSCs) have been proposed as novel cell sources of human cardiomyocytes (CMs) for disease modelling and regenerative medicine. Multiple cell types have been reprogrammed to iPSCs; however, tissue of origin may affect iPSC characteristics. Here we compared three different cell sources for iPSCs reprogramming and differentiation into CMs (iPSC-CMs).

Methods: Patient-matched adult Cardiac-resident Progenitor Cells (CPC), Bone Marrow Mesenchymal Stem Cells (BM-MSC) and Dermal Fibroblasts (HDF) were reprogrammed into iPSCs using a Sendai virus carrying the 4 Yamanaka factors (Oct4, Sox2, Klf4, and c-Myc) and then differentiated into iPSC-CMs by modulating the WNT pathways. iPSCs and iPSC-CMs phenotype was analyzed by immunofluorescence and RT-PCR. Electrophysiologically, iPSC-CMs were characterized by recording extracellular field potential of spontaneous beating areas using multi-electrode arrays (MEA). Inducibility of ryanodine receptor (RyR)-mediated Ca2+ transients was evaluated after exposure to caffeine.

Results: CPC-iPSCs exhibited a greater potential of differentiating into cardiomyocytes (CPC-iPSC-CMs), as evidenced by greater upregulation of cardiac-specific genes. Caffeine responsiveness double in CPC-iPSC-CMs as compared to BM-iPSC-CMs and HDF-iPSC-CMs. CPC-iPSC-CMs were more sensitive to JNJ303, a specific blocker for the slow component of the delayed rectifier K+ current. Consistent with this, RT-PCR analysis found increased expression of the α subunit (KCNQ1) of this potassium channel in CPC-iPSC-CMs compared with CMs derived from the other two cell types.

Conclusions: CPC, BM-MSC and HDF can be reprogrammed to iPSCs, from which iPSC-CMs can be derived. CPC-iPSC exhibited significantly higher potential in terms of cardiac differentiation.

Funding: Swiss Heart Foundation

Visto superiore (prego indicare Nome e Cognome del superiore)

Giuseppe Vassalli

Criteri per sottomissione Abstract:
NO Case report
NO Abstract senza nessun risultato
VISTO da un superiore

Invio Abstract