9° Giornata della Ricerca della Svizzera Italiana
Venerdì 15 marzo 2019

Modulo per la sottomissione abstract ricerca di LABORATORIO

Titolo (massimo **15 parole**)

Electroporation of Human Cardiac Progenitors with Pro-regenerative miRNAs Results in Their Enrichment in Secreted Exosomes

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

Balbi C., Bolis S., Barile L., Vassalli G.

Affiliazioni (ospedale o istituto, servizio o reparto, indirizzo, es: Ospedale Regionale di Lugano, Servizio di angiologia, Lugano)

Laboratory of Cellular and Molecular Cardiology, Fondazione Cardiocentro Ticino, Via Ai Soi 24, CH-6807 Taverne. Department of biomedicine Università Svizzera italiana, Lugano, Switzerland.

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

Introduction: Exosomes (Exo; nano-sized secreted vesicles) are key mediators of cell-cell communication. Exo are naturally capable of intracellular carriage of functional biomolecules and can be thought as potential therapeutic delivery vehicles. We previously showed that Exo derived from human cardiac progenitor cells (Exo-CPCs) significantly reduced cardiomyocyte (CM) apoptosis and stimulated angiogenesis both in vitro and in vivo. Moreover, Exo-CPC possess higher tropism to CM when compared to dermal fibroblast-derived Exo. Here we propose to load pro-survival and anti-apoptotic miRNAs into Exo for delivery of such therapeutic molecules to injured heart.

Methods: CPCs were electroporated with mimic-miRNA210-3p; mimic-miRNA132-3p; mimic-miRNA146a-5p or mimic-miRNA199a-3p. The miRNA content of Exo secreted by electroporated CPCs was analysed by real-time PCR. Mimc-Celmir39 was used as an electroporation control, as this miRNA species is not naturally present in mammalian cells. Exo from miRNA-enriched CPCs were characterized by flow cytometry analysis and tested in-vitro on primary rat CM for their functional activity including stimulation of proliferation.

Results: Real-time PCR showed enrichment of Exo from electroporated CPCs with the miRNA species of interest, as compared with control Exo (data are fold-increases): miRNA132-3p: 3.03 ± 0.04; miRNA146a-5p: 5.07 ± 2.60; miRNA199a-3p 8.93 ± 3.02, and miRNA210-3p: 14.49 ± 4.64. Flow cytometry characterization showed no difference in terms of expression of exosomal markers CD9, CD63 and CD81 between the Exo from electroporated CPCs and control Exo. Treatment of primary CMs with different Exo showed a significant stimulatory effect of Exo-CPC146a-5p on cell proliferation (1.45 ± 0.10 fold-increase over control Exo; $p<0.01$).

Conclusions: miRNA species of interest can be enriched in secreted Exo-CPC by electroporating them into producer cells (i.e., CPCs). miRNA-enriched Exo-CPC are taken up by primary CM and regulated their functions including proliferation.

Visto superiore* (prego indicare **Nome e Cognome** del superiore) ***campo obbligatorio**

Giuseppe Vassalli

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

Invio Abstract