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Modulo per la sottomissione abstract ricerca di LABORATORIO

Titolo (massimo **15 parole**)

Functional validation of GMP-grade large scale manufactured Exosomes from human Cardiac Progenitor Cells

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

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

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

Introduction
Cardiac progenitor cells (CPC) release exosomes (Exo-CPC) that, not only have anti-apoptotic and pro-angiogenic effects in vitro, but also prevent early decline in cardiac function in rat pre-clinical models of myocardial infarction. Thus, Exo-CPC may represent a cell-free approach for cardiac repair; Good Manufacturing Practice (GMP)-grade methods are required for a future clinical translation.
Methods
A GMP-compliant method was set-up for large-scale CPC culture and for production and isolation of exosomes (ExoGMP), through a closed system: harvest of conditioned medium, clarification, concentration, diafiltration, final sterilizing filtration. Quality controls tests were performed to evaluate identity, potency, safety of both CPC as cell source and ExoGMP as final product.
Results
CPC, cultured in GMP-compliant serum-free conditions showed a lower doubling-time than that observed in research-grade condition, while producing exosomes with similar features. Purified ExoGMP showed the typical Nanoparticle Tracking Analysis (NTA) profile; exosomes markers (CD63/Alix/TSG101) were detected. The ExoGMP isolation process gave high recovery (90% of initial ExoGMP in the final product), while removing most contaminant proteins (total protein yield 3±1%). The ExoGMP final product was sterile and negative for bacterial endotoxins.
Infarcted rat hearts injected with ExoGMP, exhibited a dose-dependent less cardiomyocyte apoptosis, and improved LV ejection fraction (LVEF) compared to those injected with control medium. The favourable changes in LVEF persisted at 4 weeks post-MI (60.1±4.1% vs. 46.2±8.3%; $p<0.05$).
Conclusion
The new large-scale production method makes safe and feasible future clinical applications. A patent application was filed opening new therapeutic perspectives.

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Visto superiore (prego indicare Nome e Cognome del superiore)

Marina Radrizzani

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

Invio Abstract