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Initial approach on the characterization of cardio-mesenchymal stem cells

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A cardinal issue concerning the clinical translation of cardiac cellular therapy is to define the most suitable cell type. In terms of differentiation capacity, cardiac stem cells (CSC) are currently the best cells for cardiac regeneration therapy; nonetheless they are an unfeasible alternative in a clinical setting due to the highly invasive procedures necessary for their extraction. Mesenchymal stem cells (MSC) emerge as a promising option for cardiac regeneration therapy because they are readily abundant in a wide variety of tissues, particularly bone marrow and adipose tissue. We propose the term cardiomesenchymal stem cells (CMSC) to designate a MSC subpopulation with a specific differentiation commitment toward cardiac tissues and a limited differentiation capacity toward traditional mesenchymal tissues. Even though there is presently no consensus regarding the relation between a particular immunophenotype and a specific cardiac differentiation commitment, we suggest that the expression of traditional CSC markers, such as CD34 and CD117, in MSC may determine cardiac differentiation engagement. Therefore, we analyzed the expression of cardiac-specific genes and proteins in CD34+/CD117+ MSC derived from bone marrow supernatant. This cellular population residing in a mesenchymal niche, exhibiting essential CSC epitopes and traditional MSC surface markers, expresses distinctive cardiac genes and produces discriminative cardiac proteins. The isolation of cardiac progenitors resident in non-cardiac niches, based on a particular immunophenotype and the expression of cardiac structural proteins, could yield a superior therapeutic efficiency and enhance the clinical feasibility of cardiac cellular therapy.

Biography

Jose R Navarro is currently pursuing medical degree at Panamerican University in Mexico City, Mexico. He has participated in research protocols since his second year at medical school and recently completed an internship at Mexico's General Hospital with honors. His main interest is stem cell therapy for cardiac diseases.

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