SEMINARIO

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EFFECT OF AGEING ON PRO-INFLAMMATORY MICRO-RNAS CONTAINED IN MSC-DERIVED EXTRACELLULAR VESICLES

The promising role of mesenchymal stem cells in cell-bases therapies and tissue engineering appears to be limited due to a decline of their regenerative potential with increasing donor age. Along the last year, it has reported the role of micro-RNAs in ageing and inmunosenescence and their relevant on extracellular vesicles from mesenchymal stem cells affecting their therapeutic potential. To advance in development EVs-based therapies to reduce the risks and drawback associated with cell-based therapies we decided study whether ageing affects the micro-RNAs profile contained in MSCs-derived exosomes. Extracellular vesicles from conditioned medium of bone marrow mesenchymal stem cells obtained of Wistar rats at four ages (newborn, young, pre-pubertal and old) using ultracentrifugation. Secondly, it was done their characterization by size using Nanoparticle Tracking Analysis (NTA), electronic microscopy and checking the exosome marker, CD63, by flow cytometry. At the last, it was checked micro-RNAs in MSC-derived EVs involved with Toll-like receptor 4 pathway, as miR-155, miR-146a, miR-132 and miR-21, using a commercial kit. We found that production of extracellular vesicles by MSCs in old age group was increased with ageing 25.63±1.17% but their expression of pro-inflammatory miRs related to Toll-like receptor 4 decreased 93.35±3.39% as compared to the other ages groups. Our extracellular vesicles had a size 160.3±18.26 nm and their expression of CD63 was 38.45±8.415%. In MSC-derived EVs the expression of miR-155, miR-146a, miR-132 decrease with age of donor. In MSC-derived EVs from pre-pubertal group had miR-21 the highest level in comparasion whit other groups and could be a regulator of function of Toll-like receptor 4 in differentiation and pro-inflammatory MSCs capacities. We conclude that ageing of rat donors affects the production of extracellular vesicles and also changed their content of pro-inflammatory miRs related to Toll-like receptor 4.

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Juan Antonio Fafián Labora es un estudiante predoctoral del grupo de TCMR de la UDC y Terapia Celular y Medicina Regenerativa del INIBIC desde hace 3 años. Ha realizado una estancia de tres meses en el laboratorio del Dr. Fons Van de Loo en el Departamento de Reumatología de la Universidad Radboud de Nigmejen financiado con una beca EMBO-2015 donde ha obtenido los resultados que presenta en este seminario.

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