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Blockade PDL1 gene expression by siRNA affects the adhesion and migration of human placenta derived mesenchymal stem cells

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It is reported that human placenta derived mesenchymal stem cells (hPMSCs) have strong immunosuppressive properties and exhibit immune-related cell surface markers similar to bone marrow derived mesenchymal stem cells, including being positive for HLA-ABC but negative for HLA-DR and a number of costimulatory molecules, such as PDL1, a negative costimulatory molecule related to T cell activation. Here we investigated whether PDL1 expression on hPMSCs involved in the adhesion and migration of hPMSCs. Culture-expanded hPMSCs showed the typical appearance, immunophenotype, multiple differentiation capacity, and highly expressed PDL1. RT-PCR and immunofluorescence analysis showed that PDL1 siRNA could be successfully transfected into hPMSCs via liposome transfection method, and the expression of PDL1 could be efficiently blocked. Cell count indicated that the difference of hPMSCs adhesion rate between blockade group and control group was no statistically significant which was observed at half an hour after cell inoculation; but at one hour or three hours after inoculation, the adhesion rate of hPMSCs was significantly higher in the blocked group than that in the control group ($P < 0.05$). Transwell cell culture system assay showed that hPMSCs migration numbers in blockade group was not significantly different with that in the control group under the culture conditions of SDF1 α . However, under the condition of DMEM complete medium or hPMSCs culture supernatant, the migration number of hPMSCs in blockade group significantly reduced ($P < 0.05$). Thus we conclude that PDL1 played an important role in the adhesion and migration of hPMSCs, which provides the theoretical basis for the further study of the biological significance of the costimulatory molecules, such as PDL1, expression on hPMSCs.

Biography

Xi-Ying Luan, PhD, is the professor of immunology. She has completed her PhD from Soochow University. She is the director of Immunology, and assistant Dean of School of Basic Medical, Binzhou Medical university. She has published more than 35 papers in reputed journals. She is also a member of the editorial board, Journal of Clinical Rehabilitative Tissue Engineering Research. Dr Luan's research focuses on the molecular mechanisms of costimulatory molecules involved in the regulatory roles of mesenchymal stem cells on immunocytes.