

Objectives Though mesenchymal stem cells (MSC) have been clinically used to repair a variety of damaged tissues, the underlying mechanisms remain elusive as the majority of the ex vivo expanded MSC die shortly after transplantation. The aim of the study was to explore the inconsistency of cell death and their therapeutic role in the process of tissue repair.

Methods Apoptosis of rat MSC was elicited by maintaining cells in the conditions of hypoxia (1% O₂, 5% CO₂, 94% N₂) or/and serum-free α modified eagle medium for 72 h, the sub-cellular substances were harvested by ultracentrifugation of the supernatants and analysed by flow cytometric techniques, surface markers like CD29, CD44A and phosphatidylserine were detected by cytofluorimetric analyses.

Results MSC apoptosis occurred in the presence of either hypoxia or serum-free condition as well, and it reached up to its maximal under the combined treatment, to which the apoptotic proportion was $17.44 \pm 2.15\%$ after the cells were exposed for 72 h. Substantial amount of membrane microparticles was released by the apoptotic MSC into the supernatants, which co-expressed MSC's surface markers CD29 and CD44A, cells membrane Annexin-V-binding phosphatidylserine as well. The amount of microparticles was around 15-fold of that of the parent cell numbers.

Conclusions Membrane microvesicles can be released from MSC under apoptosis process, which might serve as the mediators in the cross-talk between the transplanted cells and their surrounding tissues.

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MESENCHYMAL STEM CELLS RELEASE MEMBRANE MICROVESICLES IN THE PROCESS OF APOPTOSIS

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