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MIR-499 INDUCES CARDIAC DIFFERENTIATION OF RAT BONE MARROW-DERIVED MESENCHYMAL STEM CELLS

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Objectives To test the hypothesis that over-expressing miR-499 in rat bone marrow-derived mesenchymal stem cells (BM-MSCs) induces them to differentiate into cardiomyocyte-like cells.

Methods The fourth passage of rat BM-MSCs were infected with lentiviral vectors bearing miR-499 or empty lentiviral vectors as control. The expression of cardiac-specific markers, NKx2.5, GATA4, MEF2C, and cTnI in these cells were examined by real time PCR or western blot analysis, respectively, 0, 1, 3, 5, 7 days.

Results The fourth passage of the cultured rat BM-MSCs express significant markers of MSCs. After transfection of microRNA 499 in MSCs, the expression level of microRNA 499 was markedly enhanced. The mRNA expression of GATA4, NKx2.5 and MEF2C gradually increased from day 3 to day 7. The cTnI expression was detected at the same time. These cannot be detected in MSCs infected with empty lentiviral vectors.

Conclusions Over-expression of miR-499 rat BM-MSCs can induce rat BM-MSCs toward cardiac differentiation.