عنوان مقاله:

Human wild-type superoxide dismutase ۱ gene delivery to rat bone marrow stromal cells: its importance and potential future trends

محل انتشار:

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خلاصه مقاله:

Objective(s): Human superoxide dismutase ۱ (SOD۱) is the cytosolic form of this enzyme it detoxifies superoxide anions and attenuates their toxicities and concomitant detrimental effects on the cells. It is believed that the amount of these enzymes present in the oxidative stress-induced diseases is crucial for preventing disease progression. Transfection of rat bone marrow stromal cells (BMSCs) by a constructed vector carrying the human wild-type SOD۱ gene, a non-viral gene transfer method, was the main aim of this study. Materials and Methods: For this purpose, the rat BMSCs were transfected with the vector using Turbofect reagent and then stabilized. Western-blot and real-time PCR were also used for evaluation of SOD۱ expression. Results: Data analysis from RT-PCR and Western-blot techniques revealed that the stable transfected cells could secrete human wild-type SOD۱ in the supernatant. Also, the total activity of SOD۱ was about ۰.۵±۰.۰۹ U/ml and ۰.۰۰۵±۰.۰۰۲ U/ml in the supernatants of the transfected and not-transfected of rat BMSCs, respectively. Conclusion: This study showed that expansion of the stable transfected rat BMSCs by a constructed vector carrying the human wild-type SOD۱ gene is capable of secreting the active SOD۱ enzyme under ex-vivo conditions. The recommendation of this study is that the same experiment would be applicable for expression of the other form of this enzyme, SOD۳, as well. More valuable information could probably be provided about the variety of the diseases caused by superoxide anions toxicities by intervention and application of the non-viral method for expressions of SOD۱ and SOD۳ enzymes.

کلمات کلیدی:

Vector, Expression, Ex-vivo, Gene delivery, Human SOD۱, Rat BMSCs