

عنوان مقاله:

Evaluating the Effect of Eugenol on the Expression of Genes Involved in the Immunomodulatory Potency of Mouse Mesenchymal Stem Cells In Vitro

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خلاصه مقاله:

The immunomodulatory ability of mesenchymal stem cells (MSCs) has attracted interest as a unique property that makes them interesting tools for the treatment of inflammatory and autoimmune diseases. Eugenol is a volatile compound from the phenylpropanoids class of chemical compounds. Despite extensive investigations on the biological and pharmacological properties of Eugenol, its effect on stem cells, especially, on MSCs remains to be clarified. Therefore, this study was designed to evaluate the effect of Eugenol on the expression of genes (Tlr3, Tlr4, Ccl2, and Ccl3) involved in immunomodulatory potency of mouse bone-marrow derived MSCs by quantitative real-time PCR (qRT-PCR). To do so, MSCs were isolated from 4-8 weeks old mouse bone marrow (BM). The effect of Eugenol on the viability of BM-MSCs was evaluated by MTT assay at 24, 48, and 72h after treatment. The results showed that Eugenol reduced the number of BM-MSCs in a dose- and time-dependent manner. In addition, the half maximum inhibitory concentration of Eugenol on MSCs was 400 µg/ml at 24 and 48h and 200 µg/ml at 72h after treatment. Moreover, about 90% of MSCs were alive at the concentration of 12.5 µg/ml 24h after treatment. The qRT-PCR results indicated that Tlr3, Tlr4, and Ccl3 genes were up-regulated 1.6-, 1.8-, and 2.2-fold, respectively, in Eugenol-treated BM-MSCs compared to untreated controls (Fold change > 1.5; P ≤ 0.05). In conclusion, we suggest that Eugenol may somewhat regulate the immunomodulatory potency of MSCs and thus this study provides a background for further studies on the effect of Eugenol on MSCs characteristics and functions, which may finally improve their potency for cell-based therapy applications.

کلمات کلیدی:

Eugenol, Mesenchymal stem cells, Immunomodulatory potency, Mouse

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