Inhibitory effects on human leukemic U937 cells and immunomodulatory activities of royal jelly

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ABSTRACT

In this study, the royal jelly (RJ) was treated with four manners, including phosphate buffer solution (PBS) extraction, alkali extraction, heating, and enzymatic digestion, to investigate its inhibitory effect on human leukemic U937 cells and immunomodulatory activities. The results were as followings: 1.The growth of U937 cells incubated with the royal jelly of different treatments for 5 days are more inhibited than those incubated for 3 days. The fresh royal jelly shows the most effective on the growth inhibition of U937 cells via direct model (its inhibition rate is 36.65 %). The royal jelly of enzymatic digestion shows the most effective on the growth inhibition of U937 cells via indirect model (its inhibition rate is 62.39 %). 2.The cytokine contents secreted in the mononuclear cell-condition medium (MNC-CM) with royal jelly of different treatments are higher than the PBS and the medium groups. For the IL-1 β secretion, the MNC-CM with alkali extract shows the highest value (1373.35 pg/mL). For the IFN-γ secretion, the MNC-CM with enzymatic digestion shows the highest value (34448 pg/mL). For the TNF-α secretion, the MNC-CM with alkali extract shows the highest value (5287.08 pg/mL). 3.For the NO secretion, the MNC-CMs with the royal jelly of different treatments were incubated for 3 days, their NO contents were higher than those of the PBS and the medium groups, and the MNC-CM with alkali extract had the highest NO content (1.96 μM/mL). However, the MNC-CM with enzymatic digestion had a lower NO content than the PBS and medium groups. 4.For the growth index of MNC, the royal jelly of different treatments at a certain concentration can stimulate the growth of MNC when compared with the PBS and the medium groups. The RJ of heat treatment shows the highest growth index (1.16).

Keywords : Royal Jelly、Leukemic U937 Cell、cytokine、immunomodulatory activity

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