

### 论文 银杏叶提取物对U937泡沫细胞IL-1 $\beta$ 、TNF- $\alpha$ 及IL-10表达的影响

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摘要:

本研究考察了氧化低密度脂蛋白(ox-LDL)刺激的U937细胞致炎细胞因子白细胞介素1 $\beta$ (IL-1 $\beta$ )、肿瘤坏死因子 $\alpha$ (TNF- $\alpha$ )、抗炎细胞因子白细胞介素10(IL-10)及其受体(IL-10R)的蛋白及mRNA的表达,同时观察银杏叶提取物(GbE)对它们的作用。U937细胞用100 mg·L<sup>-1</sup> ox-LDL刺激24 h形成泡沫细胞,同时分别加入不同浓度的GbE(0.1, 1及10  $\mu$ g·L<sup>-1</sup>)共孵育,采用酶联免疫吸附试验(ELISA)及逆转录聚合酶链式反应(RT-PCR)方法检测IL-1 $\beta$ 、TNF- $\alpha$ 、IL-10和IL-10R的蛋白或mRNA表达。U937泡沫细胞组IL-1 $\beta$ 、TNF- $\alpha$ 、IL-10和IL-10R的蛋白或mRNA的表达较对照组显著增加( $P<0.01$ )。GbE组IL-1 $\beta$ 及TNF- $\alpha$ 的蛋白和mRNA的表达水平明显降低,IL-10的蛋白、IL-10和IL-10R的mRNA表达水平明显提高,与U937泡沫细胞组相比差异显著( $P<0.05$ ,  $P<0.01$ )。GbE对U937泡沫细胞致炎细胞因子IL-1 $\beta$ 及TNF- $\alpha$ 表达的显著抑制作用,对抗炎细胞因子IL-10及其受体IL-10R表达的显著上调作用可能是其抗atherosclerosis(AS)的机制之一。

关键词: U937细胞 泡沫细胞; 细胞因子 白细胞介素1 肿瘤坏死因子 $\alpha$  白细胞介素10 银杏

### Effects of *Ginkgo biloba* extract on expressions of IL-1 $\beta$ , TNF- $\alpha$ , and IL-10 in U937 foam cells

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Abstract:

This study is to investigate the protein and mRNA expressions of pro-inflammatory and anti-inflammatory cytokines in U937 foam cells and effects of *Ginkgo biloba* extract (GbE) on the cytokines. U937 cells were cultured with different concentrations of GbE (0.1, 1, and 10  $\mu$ g·L<sup>-1</sup>), and stimulated by 100 mg·L<sup>-1</sup> oxidized low density lipoprotein (ox-LDL) for 24 h. The expressions of interleukin-1 $\beta$  (IL-1 $\beta$ ), tumor necrosis factor- $\alpha$  (TNF- $\alpha$ ) and interleukin-10 (IL-10) in culture solution were detected by enzyme-linked immunosorbant assay (ELISA) and reverse transcriptase polymerase chain reaction (RT-PCR). The results showed that incubated with 100 mg·L<sup>-1</sup> ox-LDL for 24 h, the U937 cells became foam cells, the protein or mRNA expressions of IL-1 $\beta$ , TNF- $\alpha$ , IL-10, and its receptor IL-10R in U937 foam cells were higher markedly than those in normal U937 cells. When the cells were pretreated with GbE (0.1, 1, and 10  $\mu$ g·L<sup>-1</sup>), the increases of IL-1 $\beta$  and TNF- $\alpha$  in U937 foam cells were remarkably inhibited, but IL-10 expression increased greatly. Especially when cells were pretreated with 10  $\mu$ g·L<sup>-1</sup> GbE, the protein and mRNA expressions of IL-1 $\beta$  and TNF- $\alpha$  were markedly lower than those in U937 foam cells. The protein expression of IL-10 and mRNA expressions of IL-10 and its receptor IL-10R were markedly higher than those in U937 foam cells. GbE inhibited production of pro-inflammatory cytokines IL-1 $\beta$  and TNF- $\alpha$ , but up-regulated the production of anti-inflammatory cytokine IL-10 and its receptor IL-10R in U937 foam cells, which might be related with its anti-atherosclerotic actions.

Keywords: foam cell cytokine interleukin-1 tumor necrosis factor- $\alpha$  interleukin-10 *Ginkgo biloba* U937 cell

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