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论文

甘糖酯抗氧化作用的分子机制

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摘要:

目的探讨甘糖酯(PGMS)清除自由基抗氧化作用的分子机制。方法给大鼠ig高脂乳剂建立高脂血症模型,分成对照组、甘糖酯治疗组、甘糖酯+DDC组,治疗3周。检测血清、肝脏、脾脏和主动脉中丙二醛(MDA)的含量,超氧化物歧化酶(SOD)、谷胱甘肽过氧化物酶(GSH-Px)和过氧化氢酶(CAT)的活性,以及Cu,Zn-SOD mRNA的表达水平。结果甘糖酯治疗组大鼠,丙二醛(MDA)含量降低,SOD,GSH-Px和CAT的活性显著升高,Cu,Zn-SOD mRNA的表达水平增加;而甘糖酯和DDC联合用药治疗组,DDC抑制了甘糖酯诱导的Cu,Zn-SOD mRNA表达水平和SOD活性的升高,造成MDA含量的相应升高。结论甘糖酯通过诱导抗氧化酶SOD,GSH-Px和CAT的活性,增加Cu,Zn-SOD mRNA的表达水平,清除体内过多的氧自由基,达到抗氧化的目的。

关键词: 甘糖酯 丙二醛 超氧化物歧化酶 谷胱甘肽过氧化物酶 过氧化氢酶 二乙基二硫代氨基甲酸盐

Molecular mechanisms of antioxidant effects of propylene glycol mannate sulfate

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Abstract:

AimTo investigate the antioxidant mechanisms of propylene glycol mannate sulfate (PGMS) in hyperlipidemic rats. MethodsMale Wistar rats were given high lipid emulsion diet to establish hyperlipidemic model. PGMS was given every day at different doses (37.8 and 75.6 $mg \cdot kg^{-1}$, ig) to hyperlipidemic rats for three weeks. In addition, diethyldithiocarbamate (DDC) was given 200 $mg \cdot kg^{-1} \cdot 3d^{-1}$ (ip) to inhibit SOD activity. Then, the MDA content was examined using TBA method to show the oxidation level, and the activities of SOD, GSH-Px and CAT were examined following the kit protocols to indicate the capability of eliminating OFR. RT-PCR was applied to study the expression of Cu, Zn-SOD mRNA in rat liver. ResultsThe MDA content of PGMS treatment groups decreased markedly compared with hyperlipidemic group, and the activities of SOD, GSH-Px and CAT increased distinctly. Cu, Zn-SOD mRNA expression was significantly increased by PGMS treatment. Furthermore, the application of DDC (the SOD inhibitor) reduced total SOD activity and Cu, Zn-SOD mRNA expression induced by PGMS, and the content of MDA increased correspondingly. ConclusionPGMS can induce the activities of antioxidant enzymes and the mRNA expression of Cu, Zn-SOD, which contribute to the elimination of oxygen free radical. This may explain the molecular mechanism of antioxidant effects of PGMS.

Keywords: malondialdehyde superoxide dismutase glutathione peroxidase catalase diethyldithiocarbamate propylene glycol mannate sulfate

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