

论文

山药多糖RDPS-I的结构分析及抗肿瘤活性

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摘要:

目的研究山药多糖的化学结构和抗肿瘤活性。方法用水提取山药块茎粗多糖,经Sevag反复脱蛋白8次,透析后经DEAE-cellulose及Sephadex G-100柱色谱纯化得山药多糖RDPS-I。经完全酸水解、部分酸水解,用PC,GC,IR,高碘酸氧化,Smith降解,甲基化分析,<sup>1</sup>HNMR及<sup>13</sup>CNMR等研究山药多糖的化学结构。并用小鼠移植性实体瘤研究了RDPS-I的体内抗肿瘤作用。结果RDPS-I的分子量为41 000,比旋光度为 [α]<sub>D</sub><sup>20</sup> = +188.4° (c 0.80, H<sub>2</sub>O),特性粘度为 [η] = 16.48 × 10<sup>-3</sup> (g · mL<sup>-1</sup>)。RDPS-I是由葡萄糖、甘露糖和半乳糖以1:0.4:0.1的摩尔比组成,以α-D-(1→3)-GlcP为主链,在6-O位有α-D-(1→2)-Manp-β-D-1)-Galp支链的杂多糖。RDPS-I对移植性黑色素B16和Lewis肺癌有很强的抑制作用。结论RDPS-I是由葡萄糖、甘露糖和半乳糖构成的杂多糖,有很强的体内抗肿瘤活性。

关键词: 山药 多糖 结构 抗肿瘤

Structural analysis and antitumor activity of RDPS-I polysaccharide from Chinese yam

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Abstract:

Aim To study the structure and antitumor activity of polysaccharide from Chinese yam. Methods The tube root of Chinese yam was extracted with water, from the extract, the polysaccharide of RDPS-I was separated and purified using Sevag deprotein, DEAE-cellulose and Sephadex G-100 column chromatography. Its structure was researched by PC, GC, IR, partial hydrolysis, periodate oxidation, Smith degradation, methylation analysis, <sup>1</sup>HNMR and <sup>13</sup>CNMR analysis etc. The antitumor activity *in vivo* also studied with animal experiments. Results RDPS-I was found to be composed of Glc, Man and Gal, in a molar ratio of 1:0.4:0.1, contained a backbone composed of α-D-(1,3)-GlcP and, a short branch of α-D-(1→2)-Manp-β-D-1)-Galp is attached to the main chain, the polysaccharide had a molecular weight of 41 000, [α]<sub>D</sub><sup>20</sup> = +188.4° (c 0.80, H<sub>2</sub>O) and [η] = 16.48 × 10<sup>-3</sup> (mL · g<sup>-1</sup>). RDPS-I could significantly inhibit the cancer cell line of melanoma B16 and Lewis lung cancer in mice *in vivo*. Conclusion RDPS-I is a heteropolysaccharide of Glc, Man and Gal has significant antitumor activity.

Keywords: polysaccharide structure antitumor Chinese yam

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