Effects of traditional chinese medicine extracts on productivity, chemical properties and immunomdulatory activity of ex

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ABSTRACT

In this study, we characterized the effects of supplementary herbs extracts on mycelium cultured from the fruit body of Coriolus versicolor local strain LH1. We monitored the biomass production, extracellular polysaccharopeptide (ePSP), intracellular polysaccharopeptide (iPSP) from C. versicolor produced in the presence and absence of supplementary extracts of Salvia miltiorrhiza, Lycium barbarum and Scutellaria barbata. Metabolic profiles of with or without herbal extracts in C. versicolor LH1 obtained in 20 liter fermenters (150 rpm，25 ℃ initial pH 5) showed different in biomass production, amounts of ePSP from the culture media, and iPSP from the mycelia. The ePSP and iPSP were studied by simple sugar composition, protein content and immunomodulatory activity by their effects on the production of nitric oxide, IL-1, IL-6 and TNF- by murine RAW264.7 macrophages. The results showed that metabolic profiles of without herbal extracts in C. versicolor LH1 obtained fermentation showed different biomass production, amounts of ePSP from the culture media, and iPSP from the mycelia. The production of ePSP levels were: ePSP-Cv-SME（2.54 g/L）>ePSP-Cv-LBE (1.66 g/L) >ePSP-Cv-SBE（1.37 g/L）>ePSP-Cv （0.61g/L）and the production of iPSP were: iPSP-Cv-SME（0.49 g/L）>iPSP-Cv-LBE（0.30 g/L）>iPSP-Cv-SBE（0.29 g/L）>iPSP-Cv （0.21g/L). The chemical properties showed that the ePSP and iPSP obtained from C. versicolor LH1 with herbal extracts were highly differ from those obtained with normal cultures. In term of simple sugar composition and protein content where simple sugars included glucose, galactose, mannose, xylose, and arabinose. However, overall chemical structures analyzed by Fourier transformed infrared spectroscopy showed similar results, which indicated of bioactivity (1 - 3) glycosidic bonds. After treatment of RAW 264.7 cells with 62.5 g/ml PSPs for 48 h, the amounts of three cytokines were measured. It was found that all ePSPs preparations(ePSP-Cv, ePSP-Cv-SME, ePSP-Cv-LBE and ePSP-Cv-SBE) exhibit stimulatory effects on TNF- production in RAW264.7 cells. Cells treated with ePSP-Cv-LBE produced significantly higher levels of IL-1. Both ePSP-Cv-SBE and ePSP-Cv-LBE could significantly induce high levels IL-6 production in RAW264.7 cells. RAW264.7 cells were found highly sensitive to the treatment with iPSPs. Cells that were treated with 62.5 g/ml of the iPSP-Cv or iPSP-Cv-SME were found to be unviable. All of the PSPs mentioned above were subjected to the bioactivity assays including cell proliferation effects and productions of NO, TNF-, IL-1, and IL-6. The differences in immunostimulatory effects of these PSPs may due to the differences in conformation derived from simple sugar compositions, and protein contents.

Keywords : fermentation、Coriolus versicolor、Trametes versicolor、Salvia miltiorrhiza、Lycium barbarum、Scutellaria barbata 、extracellular

Table of Contents

封面內頁 簽名頁 授權書iii 中文摘要iv 英文摘要vi 誌謝viii 目錄ix 圖目錄xiii 表目錄xviii 1. 緒言1 2. 文獻回顧4 2.1雲芝菌簡介4 2.2雲芝菌深層培養5 2.3多醣?回收7 2.4雲芝多醣?化學特性10 2.5生物活性15 2.6免疫調節18 2.7中藥生物活性成份21 2.7.1丹參(Salvia miltiorrhiza Bge.)21 2.7.2枸杞(Lycium Barbarum.L)21 2.7.3半枝蓮(Scutellaria barbata D．Don)22 3. 材料與方法24 3.1雲芝液態培養24 3.1.1實驗菌種24 3.1.2菌種保存與更新24 3.1.3母株培養24 3.1.4液態培養24 3.2中藥萃取液25 3.3 20公升發酵槽25 3.4胞外粗多醣及胞內粗多醣分析方法26 3.4.1菌絲生物質量之製備26 3.4.2胞外多醣?之製備與測定26 3.4.3胞內多醣?之製備與測定26 3.5組成成分分析28 3.5.1酚-硫酸法分析總醣28 3.5.2中性單糖組成之測定28 3.5.3一般成分分析 29 3.5.3.1水分含量測定29 3.5.3.2粗蛋白含量測定29 3.5.3.3粗脂肪含量測定30 3.5.3.4灰分含量測定30 3.5.3.5粗纖維含量測定30 3.6 FTIR圖譜分析31 3.7細胞培養 3.7.1細胞活化及培養31 3.7.2繼代方法32 3.7.3培養基的組成32 3.7.4樣品製備32 3.7.5試驗細胞培養32 3.8 MTT測試法33 3.9錐藍排除法33 3.10 NO檢測34 3.11細胞激素分泌之測定34 3.12統計分析35 4. 結果與討論36 4.1添加不同中藥萃取液於雲芝培養基中對菌絲體、胞外多醣?(ePSP)及生產力之影響36 4.2添加不同中藥萃取液於雲芝培養基中對菌絲體、胞內多醣?（iPSP）之影響38 4.3添加不同中藥萃取液於雲芝培養基中對胞內、外多醣?之蛋白質含量影響42 4.4雲芝多醣?中單醣組成44 4.5 FTIR圖譜分析47 4.6 ePSPs及iPSPs及中藥多醣對免疫調節活性之影響57 4.6.1四種胞內多醣?對巨噬細胞RAW 264.7之影響57 4.6.2胞外多醣?及中藥多醣對巨噬細胞RAW 264.7之影響57 4.6.3胞外多醣?及中藥多醣對巨噬細胞RAW 264.7誘導NO之影響68 4.6.4胞外多醣?及中藥多醣對巨噬細胞RAW 264.7產生細胞激素TNF-、IL-1及IL-6產量之影響76 4.6.4.1 TNF-76 4.6.4.2 IL-178 4.6.4.3 IL-6 82 5.結論90 參考文獻92 圖2.1 商業化雲芝胞內多醣體回收及

純化流程圖9 圖2.2 雲芝胞內多醣?化學結構式(iPSP)13 圖2.3 雲芝胞外多醣?化學結構式(ePSP)14 圖2.4 醣蛋白質的化學結構式16 圖3.1 雲芝胞內多醣體回收及純化流程圖27 圖4.1 雲芝胞內多醣?及雲芝胞外多醣?之FTIR圖譜分析48 圖4.2 雲芝胞內多醣?、添加丹參萃取液於雲芝LH1培養基所得之胞內多醣?及丹參多醣?之FTIR圖譜分析49 圖4.3 雲芝胞外多醣?、添加丹參萃取液於雲芝LH1培養基所得之胞外多醣?及丹參多醣?之FTIR圖譜分析50 圖4.4 雲芝胞內多醣?、添加枸杞萃取液於雲芝LH1培養基所得之胞內多醣?及枸杞多醣?之FTIR圖譜分析53 圖4.5 雲芝胞外多醣?、添加枸杞萃取液於雲芝LH1培養基所得之胞外多醣?及枸杞多醣?之FTIR圖譜分析54 圖4.6 雲芝胞內多醣?、添加半枝蓮萃取液於雲芝LH1培養基所得之胞內多醣?及半枝蓮多醣?之FTIR圖譜分析55 圖4.7 雲芝胞外多醣?、添加半枝蓮萃取液於雲芝LH1培養基所得之胞外多醣?及半枝蓮多醣?之FTIR圖譜分析56 圖4.8 四種胞內多醣?(iPSP-Cv、iPSP-Cv-SME、iPSP-Cv-LBE及iPSP-Cv-SBE)在24小時對RAW264.7細胞存活率檢測58 圖4.9 四種胞內多醣?(iPSP-Cv、iPSP-Cv-SME、iPSP-Cv-LBE及iPSP-Cv-SBE)在48小時對RAW264.7細胞存活率檢測59 圖4.10 雲芝胞外多醣?在24及48小時對RAW264.7細胞存活率檢測60 圖4.11 ePSP-Cv-SME在24及48小時對RAW264.7細胞存活率檢測61 圖4.12 PSP-SM在24及48小時對RAW264.7細胞存活率檢測63 圖4.13 ePSP-Cv-LBE在24及48小時對RAW264.7細胞存活64 圖4.14 PSP-LB在24及48小時對RAW264.7細胞存活率檢測65 圖4.15 ePSP-Cv-SBE在24及48小時對RAW264.7細胞存活率檢測66 圖4.16 PSP-SB在24及48小時對RAW264.7細胞存活率檢測67 圖4.17 有無添加丹參萃取液於培養基中所產生雲芝胞外多醣?及丹參多醣?於有無添加脂多醣（LPS）對巨噬細胞RAW 264.7在24小時產生一氧化氮影響69 圖4.18 有無添加丹參萃取液於培養基中所產生雲芝胞外多醣?及丹參多醣?於有無添加脂多醣（LPS）對巨噬細胞RAW 264.7在48小時產生一氧化氮響70 圖4.19 有無添加枸杞萃取液於培養基中所產生雲芝胞外多醣?及枸杞多醣?於有無添加脂多醣（LPS）對巨噬細胞RAW 264.7在24小時產生一氧化氮影響71 圖4.20 有無添加枸杞萃取液於培養基中所產生雲芝胞外多醣?及枸杞多醣?於有無添加脂多醣（LPS）對巨噬細胞RAW 264.7在48小時產生一氧化氮影響72 圖4.21 有無添加半枝蓮萃取液於培養基中所產生雲芝胞外多醣?及半枝蓮多醣?於有無添加脂多醣（LPS）對巨噬細胞RAW 264.7在24小時產生一氧化氮影響74 圖4.22 有無添加半枝蓮萃取液於培養基中所產生雲芝胞外多醣?及半枝蓮多醣?於有無添加脂多醣（LPS）對巨噬細胞RAW 264.7在48小時產生一氧化氮之影響75 圖4.23 有無添加丹參萃取液於培養基中所產生雲芝胞外多醣?及丹參多醣?於有無添加脂多醣（LPS）對巨噬細胞RAW 264.7在48小時產生TNF-影響77 圖4.24 有無添加枸杞萃取液於培養基中所產生雲芝胞外多醣?及枸杞多醣?於有無添加脂多醣（LPS）對巨噬細胞RAW 264.7在48小時產生TNF-影響79 圖4.25 有無添加半枝蓮萃取液於培養基中所產生雲芝胞外多醣?及半枝蓮多醣?於有無添加脂多醣（LPS）對巨噬細胞RAW 264.7在48小時產生TNF-影響80 圖4.26 有無添加丹參萃取液於培養基中所產生雲芝胞外多醣?及丹參多醣?於有無添加脂多醣（LPS）對巨噬細胞RAW 264.7在48小時產生IL-1影響81 圖4.27 有無添加枸杞萃取液於培養基中所產生雲芝胞外多醣?及枸杞多醣?於有無添加脂多醣（LPS）對巨噬細胞RAW 264.7在48小時產生IL-1影響83 圖4.28 有無添加半枝蓮萃取液於培養基中所產生雲芝胞外多醣?及半枝蓮多醣?於有無添加脂多醣（LPS）對巨噬細胞RAW 264.7在48小時產生IL-1影響84 圖4.29 有無添加丹參萃取液於培養基中所產生雲芝胞外多醣?及丹參多醣?於有無添加脂多醣（LPS）對巨噬細胞RAW 264.7在48小時產生IL-6影響85 圖4.30 有無添加枸杞萃取液於培養基中所產生雲芝胞外多醣?及枸杞多醣?於有無添加脂多醣（LPS）對巨噬細胞RAW 264.7在48小時產生IL-6影響86 圖4.31 有無添加半枝蓮萃取液於培養基中所產生雲芝胞外多醣?及半枝蓮多醣?於有無添加脂多醣（LPS）對巨噬細胞RAW 264.7在48小時產生IL-6影響89 表4.1 培養基添加物對雲芝LH1菌絲體生質量、胞外多醣?產量及生產力之影響37 表4.2 培養基添加物對雲芝LH1菌絲體生質量、胞內多醣?產量及生產力之影響 39 表4.3 丹參、枸杞及半枝蓮之一般化學成分含量分析41 表4.4 添加不同中藥萃取液於雲芝LH1培養基中對胞內、外多醣?之蛋白質含量影響43 表4.5 添加不同中藥萃取液於雲芝LH1培養基中對胞內、外多醣?單醣含量之影響45

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