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• 計畫中文名稱	植生蟲草多糖體抗腫瘤代謝物-PN2 免疫機能之探討		
• 計畫英文名稱	Immunomodulatory Studies on Antitumor Polysaccharide, PN-2, from Phytocordyceps ninchukispora Su Et Wang.		
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• 中文關鍵字	抗腫瘤多糖體；S-180 細胞；雙節棍孢子植生蟲草；流動細胞分析；淋巴細胞亞群；細胞週期；PI/BrdUrd 雙染色		
• 英文關鍵字	Anti-tumor polysaccharide；S-180 cell；Phytocordyceps ninchukispora；Flowcytometry；Lymphocyte subset；Cell cycle；Propidium iodide/BrdUrd bivariate		
• 中文摘要	由台灣所發現之真菌屬,雙節棍孢子植生蟲草(Phytocordyceps ninchukispora Su et Wang),由液態培養所產生經分離、純化後所得到之水溶性多糖體(PN-2)此一多糖體經過酸水解及酵素水解分析,以及紅外線、質譜儀、質量儀以及 GC/MS 之光譜分析後,得知其化學構造爲.beta.-1-4 N-acetylglucosamine 爲主鏈,並有由.beta.-1-4-galactose, Mannose 或 Threitol 構成結合於主鏈 C/sub 6/位置側鏈之多糖。分子量約一百萬。 PN-2 具有減少小白鼠植入皮下 S-180 腫瘤惡化程度,延長壽命 21%,減少皮下腫瘤面積 29%。對 S-180 細胞引起腹水癌之小鼠體重降低 11%。再以 S-180 行人工轉移試驗,可降低結節數 88%。本研究也開發出利用 Propidium iodide(PI)染色,並以流動細胞分析儀測出轉移腫瘤細胞在肺臟中正確比例的方法。在 Ames test 中,PN-2 不具抗突變力,也無基因毒性,對於 S-180 也無細胞毒性。PN-2 可顯著提高血液中之 T,T/sub 4/,T/sub 8/ Macrophage 但對 B 細胞比例無影響。利用 PI 及 Bromodeoxyuridine (BrdUrd)行雙染色,並以 Cis-diaminedichloroplatinum(CDDP)爲細胞週期停止劑,進行 S-180 細胞引起之腹水癌細胞週期-流動細胞分析時,發現 PN-2 活化 Macrophage 使 S-180 存活時間降低 45%。但 PN-2 對 BrdUrd 之標識指標,DNA 合成時間及細胞週期比例無影響。同時也發現 PN-2 具有強烈之 Mitogen 作用使週邊血液白血球分裂能力增加,但對血液中 WBC,RBC,PLTHGB%L,%M,RDW, MPV,PDW,LYM,GRAN,HCT,MCH,PCT 等各項指標均無影響,僅對 MCV,MCHC 值有微小增加。PN-2 對體免疫無反應,但增強細胞性免疫,使小鼠對白色念珠菌吞噬力增加。		
• 英文摘要	In the liquid culture of Phytocordyceps ninchukispora, the new fungal species found in Taiwan in 1985, a water soluble polysaccharide (PN-2) was isolated. The structural analysis based on the spectrums of IR, NMR, MASS, and GC/MS, together with the data of acid and enzyme hydrolysis,		

revealed that PN-2 appeared to be a polymer of .beta.-1-4 N-acetylglucosamine as the main chain with a molecular weight approximately 1*10/sup 6/. The side chains of galactose, mannose and threitol moieties were linked by .beta.-1-4-linkage to the 6-position of N-acetylglucosamine residues of the polymer. PN-2 reduced subcutaneous tumor size by 29% and prolonged the life span of mice implanted with S-180 cells by 21%. PN-2 also reduced the nodule number in murine lung by 88% as demonstrated by artificial metastasis test of the 14th day after S-180 cell implantation. A flow-cytometric measurement was established to distinguish normal lung cell and S-180 cells in the present study. PN-2 showed no direct cytotoxic effect on tumor cells and was neutral in the Ames test. The antitumor activities were evidenced by increasing total number of T cells, T/sub 4/cells and macrophages as demonstrated by flow cytometric analysis. PN-2 dramatically reduced the viability of the tumor cell as indicated by BrdUrd and PI bivariate staining, but no effect on labeling index of BrdUrd, DNA synthesis time (Ts) and G/sub I/S/G/sub 2/M ratio. I.p. administration of PN-2 strongly activated macrophages and a prominent mitogenic effect which resulted in increasing WBC division ability. I.v. administration of PN-2 in mice did not change the peripheral blood profiles including the percentage of WBC, RBC, PLT, HGB%L, %M, RDV, LYM, GRAN, HCT, MCH and PCT; but slightly increased the values of MCV and MCHC.