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• 計畫英文名稱	Evaluation of Gene and Protein Delivery to Cells via Polymeric Micelles		
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• 中文關鍵字	基因傳送; 蛋白質傳送; 高分子微胞; 胞飲作用; 內皮細胞; 高分子; 膠微粒		
• 英文關鍵字	Gene delivery; Protein delivery; Polymeric micelle; Endocytosis; Endothelial cell; Polymer; Micelle		
• 中文摘要	因藥物傳送系統中,具有(PEO)的水溶性超微聚合粒子,漸漸開始發展。其主要因素爲此類特殊水溶性超微聚合粒子,除本身粒子在 nm 範圍中,在藥劑學上,並具有延長藥效劑型、容易製備與良好安定性的特性外,此粒子可以載程非水溶性藥物於其內,並可避免一般聚合物引起生物體內之免疫反應,或者延長、避免肝臟代謝之現象。然而這類超微聚合粒子如何傳送吸收至組織中,或免除組織排除之機制,至目前爲止,仍須探討與研究。因此本計畫主要目的是利用已知 PEO-PBLA 所形成之超微聚合粒子來探討其本身特性與組織、細胞相互關係。第二年計畫主要方向是,第一利用具有螢光物質 FITC 與超微聚合粒子化學結合後,以利增加觀察與組織相互互動之關係能力。其結果經合成及純化後,在利用 GPC 偵測時,發現聚合物 PEO-PBLA-FITC 之濃度大於 0.01-0.05 mg/ml 時,可形成超微聚合粒子,並以 DLS 測量,其粒子在 56 nm 範圍並且粒子分布非常均一(分散性=1.17)。同時在螢光動脈細胞組織進行穿透中,超微聚合粒子對溫度、NaF、NaN/sub 3/、Wortmannin、Cytochalasin B、反向穿透中均會受其抑制作用。進而以對焦螢光顯微鏡中,發現超微聚合粒子會以能量胞飲作用,在 15 分鐘內有效分散於細胞核與細胞質中。		
• 英文摘要	Purpose. Determine aortic endothelial cells permeation ability and mechanisms of the aqueous block copolymeric micelles, poly(ethylene oxide)-poly(benzyl aspartate) (PEO-PBLA) chemically conjugated with FITC by transport study and confocal laser scanning microscopy. Methods. The block copolymers' PEO-PBLA-FITC was first synthesized and characterized by GPC and CMC, confocal microscopy. Permeation ability and mechanisms of polymeric micelles in aortic endothelial cells		

were evaluated by incubating with NaF, NaN/sub 3/, wortmannin, cytochalasin B inhibitors, at 20.degree.C, and under reverse condition. The extent of localization of uptake polymeric micelles was established by confocal microscopy. Results. The size of the aqueous PEO-PBLA-FITC polymeric micelles was detected around 56 nm with unimodal distribution by AFM. The CMC test revealed the fluorescence intensity increased to around 0.01-0.05 mg/ml. NaF, NaN/sub 3/, wortmannin, cytochalasin B inhibitors, at 20.degree.C, and under reverse condition inhibited the absorption of polymeric micelles through aortic endothelial cells with apparent permeability coefficients of 18.07.plmin.1.03, 12.98.plmin.0.93, 11.31.plmin.0.77, 12.44.plmin.1.23, 6.40.plmin.0.23, 11.11.plmin.0.46, 10.22.plmin.1.09x10/sup -7/ cm/sec, respectively. Confocal laser microscopy showed that fluorescent compounds were distributed in the intracellular cytopolasm and nucleus. Conclusion. PEO-PBLA-FITC copolymeric micelles in an aqueous system were transported by energy dependent endocytosis and were localized on transcellular and nucleus endothelial cells.