磁場驅動微脂粒藥物釋放之研究

The Study of Magnetic Field Trigger Drug Release from Liposome

中文摘要

微脂粒一直以來被認爲是投藥時輸送藥物的良好奈米載體。但是微脂粒在藥物輸送時面臨專一釋放的問題。因此希望以物理方式驅動微脂粒藥物釋放，本研究以薄膜水合法與擠壓法製造單層微胞微脂粒(SUV)包覆水溶性藥物 5(6)-Carboxylfluorescein 的螢光指示劑經由磁場照射，以粒徑儀、界面電位儀與螢光儀發現微脂粒經由磁場照射後使得微脂粒形體改變，粒徑和帶電性明顯變化、螢光藥物釋放量增加。由結果顯示微脂粒經由磁場照射在第 1 和 3 小時的粒徑和界面電位均有改變，螢光液也滲漏，顯示磁場可驅動微脂粒藥物釋放。在微脂粒變形度方面，當微脂粒嵌入膽固醇後觀察其變形度較差，由 DSC 量測嵌入膽固醇的微脂粒其相轉移溫度升高，由變形度和相轉移溫度證實當微脂粒嵌入膽固醇使得微脂粒膜堅硬，將來也可用變形度推測微脂粒膜的硬度和物理穩定度。

英文摘要

Liposome is a well known excellent drug delivery nano-particle. While liposome delivery has a major problem —drug release. Therefore, we used physical mechanism trigger drug release from liposome. In this study, the small unilamellar vesicles (SUVs) liposome were encapsulated hydrophilic marker drug 5(6)-Carboxylfluorescein and prepared by the thin layer hydration and extrusion methods. Liposomal suspension were exposed to the magnetic field. We measure the particle size and zeta potential of the liposome and understand the behavior of 5(6)-Carboxylfluorescein leakaged after exposed to magnetic field. In our study we find that magnetic field can induce particle size and zeta potential change while the liposome exposed to 1st and 3rd hour, the magnetic field can trigger drug massive release from liposome. While liposome incorporated cholesterol we measured the Tm (DSC) and liposome deformability to predict the rigidity and physical character of the lipid bilayer.