• 系統編號	RB8401-1366
• 計畫中文名稱	直打用間質性控釋材質之開發研究
• 計畫英文名稱	Development of Matrix Materials for Direct Compression of Controlled Release Dosage Forms.
• 主管機關	行政院國家科學委員會
• 計畫編號	NSC83-0412-B038-005
• 執行機構	台北醫學院藥學研究所
• 本期期間	8208 ~ 8307
• 報告頁數	0 頁
• 使用語言	中文
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• 中文關鍵字	水性分散液；溼式造粒法；包覆顆粒； 間質性錠片；包覆效率
• 英文關鍵字	Aqueous dispersion；Wet Granulation；Coated granule；Matrix tablet； Coating efficiency
• 中文摘要	直接壓錠法爲製備間質性口服控釋劑型方法中,最簡單且快速的製造方法,本實驗即針對直接壓錠所具備的優點,嘗試開發可用的直打用間質性控釋材質。採用的方法爲利用溼式造粒法將常用的賦型劑包括乳糖和磷酸二鈣,以乙基纖維素的水性分散液(Surelease 25% w/w)進行包覆而製備成間質性控釋材質,再將此些材質和藥物混合均勻後,以直接壓錠法壓製成錠。所選用的模式藥包括水溶性較好的 Captopril 和水溶性較差的 Nifedipine。 在第一部分以 Captopril 爲模式藥的實驗中,探討的實驗變因有賦型劑種類,高分子材料的用量,水性塑化劑的添加量。除評估包覆顆粒的物化性質及壓錠特性之外,並藉著體外溶離試驗來評估此些控釋材質對水溶性藥物的緩釋效果。結果顯示,包覆顆粒的流動性皆良好,以此爲直打顆粒應具有相當的可行性。此外由壓縮指數的結果也可瞭解所有的實驗處方皆具有良好的可壓縮性。而所壓製成的錠片之硬度適當,重量偏差和脆度皆很小,而且再現性也良好。隨著包覆用量由 1%至 10%之增加,緩釋的效果愈好。這在使用乳糖和磷酸二鈣爲賦型劑的結果皆相同。 在第二部分以 Nifedipine 爲模式藥的實驗中,延續第一部分的研究方式。其實驗結果顯示,各處方的間質性顆粒均具備不錯的顆粒物理性質,可用於直接壓錠。而藥物由所製備的錠片之溶離,也隨高分子材質包覆量的增加,而緩釋效果愈好。而藥物固體分散系的製備也有助益於藥物的溶離。另外,由於乳糖和磷酸二鈣在水溶性上的差異,造成對於水溶性較差的藥物亦有不同的緩釋效果,所以將兩種賦型劑的包覆顆粒以不同比例混合使用,也可進一步調整此類藥物所需的溶離速率。
• 英文摘要	Direct compression is a fastest and simplest way to manufacture a matrix-type controlled release dosage form. Since there are many advantages for direct compression, an attempt to develop a practically useful matrix material for direct compression was initiated.

Employing wet granulation method, two common-used excipients of lactose and dicalcium phosphate was coated in a planetary mixer with polymeric aqueous dispersion of ethylcellulose. Thereafter, drugs were mixed with those granules to produce matrix tablets by direct compression. In the first part of this study, captopril having good water solubility was selected as a model drug. The formulation variables including the kinds of excipients that was used to prepare matrix materials, the amount of ethylcellulose coated, and the addition of water soluble material were tested. The physical properties of coated granules and the characteristics of corresponding tablets were examined. The retarded extent of drug dissolution was evaluated by measuring the dissolution rate of captopril from the corresponding matrix tablets. The results indicated that the coated granules possessed well flowability and compressibility, and was suitable for direct compression. The dissolution rate of drug from these matrix tablets decreases with an increasing amount that used to coat excipient. There shows no significant difference in controlling characteristics of the release rate between lactose and dicalcium phosphate. In the second part of this study, a similar approach was employed to evaluate the controlling characters for nifedipine having less water solubility. The results illustrated that all those matrix formulations demonstrated optimal physical properties in term of flowability and compressibility. It was also suitable for direct compression to manufacture matrix tablets with enough hardness and friability as well. Regarding the release characters, it showed that the higher amount of ethylcellulose used to coat excipient, the effect of sustained release would be better. Solid dispersion of nifedipine with HPMC was able to enhance the drug release. There showed different controlling characters between lactose and dicalcium phosphate for such a drug of nifedipine with a less water solubility. It seems to be possible to further mix two kinds of coated granules in various ratio to optimize the release rate.