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• 計畫中文名稱	以體外穿皮方法及體內非侵入性皮膚檢測儀器評估市售含純		
• 計畫英文名稱	Topical Application of Commercial Capsaicin Products Evaluated by in Vitro Permeation and in Vivo Bioengineering Methods		
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• 中文關鍵字	辣椒素； Nonivamide；局部塗敷；皮膚；水化凝膠		
• 英文關鍵字	Capsaicin；Nonivamide；Topical application；Skin；Hydrogels		
• 中文摘要	於此研究中探討自製水性凝膠中辣椒素和 nonivamide 體外及體內經由皮膚的吸收，另外也評估市售辣椒霜劑(cream)，以便與水性凝膠相互比較。皮膚剝片技術 Mexameter 則用以評估角質層中藥物含量，及體內吸收的辣椒素所引起的皮膚紅斑效應。研究結果顯示藥物在皮膚及水性凝膠基質之間的分配(partitioning)，似乎在穿透皮膚過程中佔有重要角色。由水性凝膠釋出的辣椒素之體外穿透皮膚能力，發現視所使用聚合物的物化性與濃度而定。水性凝膠中加入非離子性的 pluronic 高分子聚合物會造成辣椒素的釋出阻延。另一方面，在體外辣椒素的皮膚穿透能力，陽離子的聚甲殼糖(chitosan)水性凝膠及陰離子的 carboxymethyl cellulose (CMC)水性凝膠，都比霜劑基劑為高。Nonivamide 的皮膚穿透，在體外試驗發現是在塗敷的後期，有阻礙吸收效應。體內研究的個體間差異比在體內皮膚穿透試驗中顯著。霜劑在體內誘發的皮膚紅斑現象視藥物濃度而定，但在水性凝膠中則並未觀察到此濃度相關性（dose-dependency）。塗敷 nonivamide 的皮膚出現紅斑較塗敷辣椒素強烈。此研究成果指出：局部塗敷辣椒素和 nonivamide 時，體外的皮膚穿透能力和體內的紅斑反應間有一定的相關性，同時也看到體內試驗中，角質層中藥物含量和皮膚紅斑試驗間有相關性發現。關鍵詞：辣椒素、合成辣椒素、局部塗敷、皮膚、水化凝膠		
• 英文摘要	The in vitro and in vivo skin absorption of capsaicin and nonivamide from hydrogels is investigated in this study. The commercial creams of capsaicin was also evaluated to compare with hydrogels. Both skin stripping technique and Mexametera were used to evaluate the drug retained in stratum corneum (SC) and skin erythema of in vivo capsaicin and nonivamide absorption. The partition of drug between skin and the hydrogel matrix seems to play an important role in the permeation process. The in vitro permeation of		

capsaicin from hydrogels depends on the physicochemical nature and the concentration of the polymer used. The incorporation of nonionic Pluronic F-127 polymer into hydrogels resulted in a retarded release of capsaicin. On the other hand, the in vitro capsaicin permeation showed higher levels in cationic chitosan and anionic carboxymethyl cellulose (CMC) hydrogels than cream bases. The permeation of nonivamide was retarded at the late stage of in vitro application. The inter-subject variation was more significant in the in vivo study than in vitro skin permeation experiments. The creams induced in vivo skin erythema depending on the drug concentration, however, the dose-dependency was not observed in hydrogels. Nonivamide-treated skin showed stronger erythema than capsaicin-treated skin. The present study indicates that there is a moderate correlation between in vitro skin permeation and in vivo erythema responses of topically applied capsaicin and nonivamide. The correlation between drug amount in SC and skin erythema test in vivo was also observed. Keywords: capsaicin; nonivamide; topical application; skin; hydrogels