• 系統編號	RN9305-2549
• 計畫中文名稱	黏膜傳輸 5-氨基酮戊酸(ALA)作爲口腔癌前病變及口腔癌之螢光診斷法---劑型研發(III)
• 計畫英文名稱	Fluorescence Diagnosis of Precancerous Lesions and Oral Cancers by Mucosal Delivery of 5-ALA---Dosage Form Design (III)
• 主管機關	行政院國家科學委員會
• 計畫編號	NSC91-2736-L038-004
• 執行機構	台北醫學院生物醫學技術研究所
• 本期期間	9101 ~ 9112
• 報告頁數	14 頁
• 使用語言	--
• 研究人員	蔡翠敏 Tsai, Tsui-Min
• 中文關鍵字	5-氨基酮戊酸；藥物輸送系統；高效液相層析法
• 英文關鍵字	ALA; Drug delivery system; HPLC
• 中文摘要	本計畫中，我們利用體外細胞培養方式，探討時間、濃度、以及外來添加物對於細胞將 ALA 代謝生成 PpIX 的影響，並於考量劑型所應具有之物理特性之後，發展以黏膜吸附性材質的溫控式親水性凝膠，作爲 ALA 口腔塗抹劑型的組成。此藥物輸送系統亦 已由初步的動物實驗驗證其效益：以化學致癌物刺激八週之倉鼠頰囊袋內膜，在投予含有 ALA 之親水性凝膠後，所產生之 PpIX 的螢光強度明顯高於未以化學致癌物刺激過之對照側；並且在頰囊袋內膜以親水性凝膠塗抹等劑量之 ALA 所產生之 PpIX 的螢光強度也相當或高於以腹腔注射之結果。我們也測試含藥比例與基劑對於螢光偵測效果的影響。實驗結果顯示，適度的組成比例調整可獲致更好的實驗結果。然而此輸送系統並未能克服 ALA 在液體狀態中不穩定的事實，所有製備在 2 週內均有不安定的問題存在。爲因應臨床試驗可能需監測血中濃度的需求，我們業已建立 ALA 血中濃度的高效液相層析分析方法。
• 英文摘要	In this project, an in-vitro cell culture system was developed to study the effect of time, concentration, and the pharmaceutical excipients on the transformation of ALA into PpIX. Based on the studies and the physical properties of the excipients, we have developed a hydrophilic temperature-controlled mucoadhesive sol-gel system for ALA, which is used to be applied to the oral cavity. Animal studies have confirmed the fluorescent-effectiveness of this delivery system. When ALA sol-gel system was applied onto the side of the buccal pouch pretreated with carcinogen for 8 weeks, the PpIX fluorescence intensity was relatively stronger than the control site. The ALA sol-gel system also showed similar or stronger PpIX fluorescence at the detection site compared to the results by ALA i.p. injection. The effects of ALA concentration and the composition of the sol-gel system were evaluated. Animal studies also shown that proper adjustment on the concentration of ALA and the

compositions gives better result. However, this sol-gel delivery system cannot help to stabilize ALA in aqueous conditions. In two weeks, all of the preparations were showing more or less instability. In order to meet the potential needs from further clinical studies, we have already developed a HPLC analyzing method to monitor the concentration of ALA in human blood.