• 系統編號	RN9404-0572
• 計畫中文名稱	以顯微傅立葉轉換式紅外線光譜法探討直腸系細胞及組織之蛋白質二級結構變化
• 計畫英文名稱	Protein Secondary Structural Characterization of Colonic Cells and Tissues by Microscopic FT-IR
• 主管機關	行政院國家科學委員會
• 計畫編號	NSC92-2218-E038-004
• 執行機構	臺北醫學大學醫學研究所
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• 使用語言	中文
• 研究人員	曾厚; 何元順 Tseng, How; Ho, Yuan-Soon
• 中文關鍵字	紅外線光譜; 蛋白質; 二級結構; 直腸 癌
• 英文關鍵字	Fourier-transform infrared spectroscopy (FT-IR); Protein secondary structure; Malignant; Frozen-sectioning
• 中文摘要	本研究主要以冷凍切片及傅利轉換紅外線光譜法，有系統地進行基礎資料收集與分析，再與傳統的病理切片進行比對，作爲未來的臨床診斷或治療上提供重要的參考依據。在組織的實驗上，是以冷凍包埋液將適當大小的組織包埋後再進行冷凍切片，然後以 FT-IR/Microscope 觀察正常組織與惡化組織之蛋白質二級結構變化情形；在細胞部分，則以大腸癌 Cellline(HT29、COLO 205)及肝癌細胞(Hep G2、Hep 3B)，貼附於第二型鈦金屬圓片、矽晶圓及蓋玻片上。由所得結果中發現，鈦金屬圓片之生物相容性高，矽晶圓片雖穩定但和標準片差異頗大，故須鍍上金箔以得較佳背景值， 之後觀察組織細胞樣本並以 Deconvolution、Second derivative 及 Curve fitting 等進行波峰分離並分析統計。而就所得的結果而論，Carcinoma 中 β-sheet 由正常組織 24.26%降至 20.05%，Random coil 由 25.50%變爲 22.71%，α-helix 由 29.54%變爲 25.01%， β-turn 由 20.46%變爲 32.08%；Adenocarcinoma 中 β-sheet 由 20.39%變爲 20.19%，Random coil 由 24.71%變爲 18.78%，α-helix 由 33.50%變爲 20.91%，β-turn 由 21.40%變爲 40.08%；總體而言，癌化組織之 β 結構含量較正常組織高，亦即向高波數位移之傾向；細胞方面，加入酒精濃度高者有朝低波數位移之傾向並細胞有萎縮之情形，在 COLO 205 的研究中，β-sheet、 Random coil、α-helix、β-turn 分別所代表在蛋白質二級結構百分比爲 35.42 %、28.01%、19.77 %、16.79 %，可以得知 COLO 205 在 AmideI 中 β-sheet 含量最高，加上 β-turn 之含量，則屬於 β-型之二級結構其含量將超過一半以上，恰可與大腸直腸癌組織之結果互爲呼應。未來希望對各種不同疾病與正常情況下進行比對，並找出其規則性進而作爲將來臨床診斷判讀的依據。
• 英文摘要	By alternately compares with the changes of protein secondary structure in malignant and normal tissues and cells provides the deep rich insight the understanding to at present still not clear some cancer lines. It provides an important reference for clinical cure or diagnosis, with systemic data base

collection and analyses through the methods of frozen-sectioning and FT-IR spectroscopy. In tissue, the spacemen embedding deposits for fresh-frozen, and prepare by frozen-sectioning, then by FT-IR spectroscopy observes the changes of protein secondary structure in malignant and normal tissues. In cell, colon cancer cell line (HT29, COLO 205) and hepatoma (Hep G2, Hep 3B) which with attach character are selected, then attach on the prepared Ti disc, wafer and cover glass disc. Then observe samples by deconvolution, second derivative and curve fitting carry on the wave ridge separation and the analysis statistics. Overall, the content of cancer tissues beta structure content comparatively normal tissue is high, that is tendency to high wave number displacement; The cell aspect, treated with different concentration of alcohol have tendency of and the cell the dynasty low wave number displacement has withers the situation, in COLO 205 research, beta-sheet, random coil, alpha-helix, beta-turn distinction represents in the protein secondary structures percentages is 35.42 %, 28.01 %, 19.77 %, 16.79 %, respectively. In this study, COLO 205 in Amide I, beta-sheet content is highest, in addition beta-turn content, then will belong to beta type secondary structures its content to surpass one above the half, exactly might mutually for echo result of with the colon cancer tissues. Future hoped carries on to in each kind of different disease and the normal condition compared to, and discovers its regularity then the basis which will interpret as the future clinical diagnosis.