# 朝陽科技大學 098學年度第2學期教學大綱
# Molecular detection techniques; principles and application 分子檢測技術之原理與應用

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| 當期課號 | 7255 | Course Number | 7255 |
| 授課教師 | 張清安 | Instructor | CHANG,CHIN AN |
| 中文課名 | 分子檢測技術之原理與應用 | Course Name | Molecular detection techniques; principles and application |
| 開課單位 | 生化科技研究所碩士班二A | Department | |
| 修習別 | 選修 | Required/Elective | Elective |
| 學分數 | 3 | Credits | 3 |
| 課程目標 | 本課程之目的乃使學生能瞭解分子檢測技術之發展、原理與產業應用。另外對於分子檢測技術與產業未來發展趨勢亦將予以介紹。透過本課程將使學生對於分子檢測之理論與應用實務均能充分掌握。 | Objectives | The main objective of this course is to help students comprehend the principles, mechanisms and applications of serological and molecular techniques for detection of molecules such as proteins and nucleic acids. The future trend for the development of molecular techniques will also be discussed in the course. |
| 教材 | 一、教師自編。<br>二、免疫學 第四版 總校閱 許元勳 高立圖書<br>三、Peters, K.E., C.C. Walters, and J.M. Moldowan, 2005. The Biomarker Guide 2nd Edition | Teaching Materials | 1.Teacher's own materials<br>2.Coico, Sunshine, Benjamini:Immunology: A Short Course, 4th Edition<br>3.Peters, K.E., C.C. Walters, and J.M. Moldowan, 2005. The Biomarker Guide 2nd Edition |
| 成績評量方式 | 期末考試及讀書心得報告。 | Grading | Final examination and reading assignment report. |
| 教師網頁 | | | |
| 教學內容 | 免疫應用:<br>一、免疫之基本原理。先天免疫與後天免疫。<br>二、免疫細胞之種類與功能。免疫反應誘發之過程與機制。<br>三、株落選擇與免疫球蛋白之分泌過程。免疫球蛋白之種類與功能。<br>四、單元抗體與多元抗體之差異與應用。<br>五、免疫反應與抗體專一性及親和性之關聯。抗原抗體交互作用。抗體多樣性的產生。<br>六、抗體之製備技術。Ⅰ. 抗原之基本條件。Ⅱ. 抗原之純化、保存與製備。<br>七、抗體之製備技術。Ⅲ. 免疫動物之選擇、注射及採血技術。<br>八、抗體之製備技術。Ⅳ. 血清與抗體之純化與保存方法。<br>九、血清學技術。Ⅰ. 血清學技術之演變。<br>十、血清學技術。Ⅱ. 血清學技術之種類與原理<br>十一、 血清學技術。Ⅲ. 血清學技術在生物學研究上之應用。<br>十二、血清學技術在分子生物學研究上之應用<br><br>螢光與冷光的知識與操作應用:<br>一、螢光與冷光之介紹。<br>二、時間差螢光測量。<br>三、螢光共振能量轉移。<br>四、ATP生物冷光反應技術。<br>五、基因啓動子活性分析。<br>六、核醣核酸讀碼框滑動分析。<br><br>生物標誌:<br>一、臨床一般偵測的生物標誌。<br>二、毒性生物標誌。 | Syllabus | Application of immune<br>1.Basic theory of immuonology. (Innate immunity and adaptive immunity)<br>2.Cells involved in immune response.<br>3.Types and their functions of immunoglobulins.<br>4.Monoclonal and polyclonal antibodies, their characteristics and applications.<br>5.Specificity and affinity of antibodies and their application in serological tests. (The interaction of antigen and antibody , and production of antibody diversity)<br>6.Preparation techniques for antibodies; Ⅰ. Types of antigens, Ⅱ Purification, preservation and preparation of immunogens.<br>7.Preparation techniques for antibodies; Ⅲ. Selection of animals for immunization, immunization and bleeding technologies.<br>8. Preparation techniques for antibodies; Ⅳ. Purification and preservation techniques of antisera and antibodies.<br>9.Serological techniques; Ⅰ. Development and future trend of serological techniques.<br>10.Serological techniques; Ⅱ. Mechanism and protocol of various important serological techniques.<br>11.Serological techniques; Application in biological research.<br>12.Serological techniques; Application in molecular biological research. |

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| | 三、癌症藥物發展之生物標誌。 | | Application and knowledge of fluorescence and luminescence<br>1.Introduce fluorescence and luminescence<br>2.Time-resolved fluorescence measurement<br>3.Fluorescence resonance energy transfer<br>4.Adenosine-5'-triphosphate bioluminescene technique<br>5.Analysis of promoter activity<br>6.Frameshifting analysis<br><br>Biomarker<br>1.Biomarkers in clinical general diagnostics<br>2.Toxicity Biomarkers<br>3.Biomarkers for Cancer drug development |