抗核抗體免疫螢光影像特徵萃取與分類之研究

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摘 要

在免疫疾病診斷上，抗核抗體（Anti-Nuclear Antibodies，ANA）的辨識非常重要依據。目前最常用的檢驗方式是以間接免疫螢光法（Indirect Immuno-Fluorescence，IIF）觀察螢光影像的螢光形態，此種以人眼觀察的作法相當費時。因此本論文提出二種分類方法，藉由數位影像處理技術，辨識抗核抗體螢光影像的螢光形態。方法一中，將影像經由前處理後，抽取螢光影像的細胞區域，再從區域中萃取特徵，組成影像特徵向量。特徵向量的組成是由拉普拉斯係數（水平與垂直的2次微分，斜對角的2次微分）和曲率的平均值與標準差，共6種特徵。而方法二，從每一細胞區域萃取特徵，並新增細胞內強度的標準差，組成區域特徵向量，共7種特徵。實驗中使用均質型（homogeneous，diffused）、周邊型（peripheral）、粗點型（coarse speckled）及離散點型（discrete speckled）四種螢光形態類型，共168張影像，評估提出方法的效益。結果顯示提出方法的結果相當優越，最低的分類正確率至少94%。

關鍵詞 : 抗核抗體;螢光影像;特徵萃取;分類

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