Feature Extraction and Classification of Antinuclear Antibody Immunofluorescence Images

謝宗佑、張世旭

E-mail: 9707433@mail.dyu.edu.tw

ABSTRACT

Identification of anti-nuclear antibodies (ANA) is an important part of autoimmune disease diagnosis. Hence, this paper proposed two classification methods for identifying the pattern of immunofluorescence images by digital image processing. In the first method, Haar wavelet and other image pre-processing techniques are used to get the region of nuclei from the image, and then the feature information are extracted from this region and used to decide the pattern of image, while the second method is different from the first method, gets the regions of each nucleus from the image, and then extracts the feature information from the regions for classifying the pattern of image. In the experiments, four pattern of antinuclear antibodies (homogeneous, peripheral, coarse speckled, and discrete speckled) are used to evaluate the proposed methods. The results show both proposed methods are excellent, the classification rate is above 94%.

Keywords : anti-nuclear antibody ; immunofluorescent images ; feature extraction ; classification

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