

THE MEASUREMENT OF S100 PROTEIN AND NEURONE SPECIFIC ENOLASE (NSE) IN  
MELANOCYTIC TUMOURS BY VIDEO IMAGE ANALYSIS

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The behaviour of malignant melanomas is exceedingly difficult to predict. The depth of invasion is a most significant index but there is subjective evidence that invasive cells express higher levels of S100 protein and NSE (two markers of melanocytes) than benign cells. The more intense staining appears in the deeper portions. This phenomenon is of potential prognostic value. The problem is to measure the intensity of the stain to allow an objective assessment.

S100 protein and NSE can be demonstrated using an immunohistochemical method with alkaline phosphatase as a marker enzyme for the antibody/antigen reaction. This enzyme is detected using the AS-alpha naphthol/fast red staining technique which gives a deep red colour.

In this study 20 cases of malignant melanoma and 18 benign melanocytic lesions were stained for S100 protein and NSE in the same batch. The integrated optical density per unit area (AOD) of the tumour tissue was measured using a microcomputer video image analysis system.

The average staining intensities of the superficial and deep layers were compared, the lower layer representing the deeper invasive component of malignant tumours. The staining intensity was also compared between benign and malignant lesions for the upper, lower and total tumour regions.

The NSE staining intensity was significantly higher in malignant lesions for the upper, lower and total measured areas. Similarly there was an increase in S100 protein, but this was only slight and not significant.

Comparing the superficial and deep regions, the mean AOD of S100 protein was not significantly different for benign lesions. However, there was a significant difference between superficial and deep regions ( $p < 0.01$ ) for the malignant melanoma cases. For NSE there was no significant difference between upper and lower regions in either group.

The results suggest that in practice, measurement of the AOD of NSE may be more effective for discerning between benign and malignant lesions.

In lesions where the diagnosis of malignancy is uncertain, the ratio of S100 protein staining densities between superficial and deep regions may be the better indicator of behaviour in the individual case.

The assessment of staining intensity by use of microcomputer image analysis system, being fast, accurate, of low cost and simple in operation holds great promise for routine application.