APPLICATION OF CONFOCAL INFRARED MICROSPETRSCOPY IN THE
STUDY OF AN EMBEDDED HEMANGIOMA TISSUE

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Confocal infrared microspectroscopy is becoming a powerful tool in biomedical applications, as this method is able to provide information of chemical composition and compositional changes of tissues and cells. The aim of this work is to investigate the infrared spectral patterns of hemangioma tissues with a Fourier–transform infrared microspectrometer. We measured infrared spectra in the region 800–4000 cm$^{-1}$ of a thin paraffin-embedded hemangioma tissue at zones showing different features with a spectral resolution of 4 cm$^{-1}$ and a spatial resolution of 20 μm. Two absorption bands at ~1650 and ~1080 cm$^{-1}$, corresponding to the C=O stretching vibration of amide I and the symmetric PO$_2^-$ stretching vibration of phosphate linkage of DNA nucleotides, respectively, were identified in all the measurements; their chemical maps at different zones were thus obtained and compared. Moreover, detailed analysis of intensity changes and frequency shifts of these two absorption bands at different locations for each zone were performed to reveal the spatial and chemical distributions. Our preliminary results show that these two absorptions in the malfunction regions are greater than those in a normal region; the significant increase of absorptions of the phosphate linkage of DNA nucleotides in the malfunction regions suggests that nucleation takes place rapidly in these regions. We will discuss the plausible potential of confocal infrared microspectroscopy as a fast cancer-screening tool.