Oral presentation

Spectral scatter scanning system for surgical margin detection

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Tumour margin detection in real time without the use of additional molecular stain would be desirable. Surgical use of a microscopy tool would be ideal, but most systems focus on microscopic disease evaluation, whereas tools for macroscopic scanning of tissue such as enhanced endoscopy imaging are less well developed. A raster scanning scatter spectroscopy system has been evaluated for imaging the spectral signature remitted from tissue, with an online classification algorithm, which maximizes the ability to identify regions of tumour from regions of normal tissue. The system uses a wide band of wavelengths from 400 nm up to 700 nm, and recovers the scatter power, scatter amplitude, and absorption species, from the reflectance from a 100 micron spot, allowing imaging of tissue a high frame rate. The system uses dark field illumination and spectrometer detection in the emission channel together with a scanning mirror. The early prototypes of the system were tested on pancreas tumours and prostate tumour margin detection, and current work is ongoing in breast cancer margin delineation. The automated tissue classification from the data uses a k-nearest neighbours classification, to provide tissue delineation.