

SPECTRAL CONFOCAL REFLECTION MICROSCOPY USING A SUPERCONTINUUM SOURCE

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In biological imaging, the confocal microscope is most commonly used in fluorescence mode, in conjunction with appropriate fluorescent markers, to reveal structural and functional information about a specimen. The choice of illumination wavelengths had originally been restricted to the available laser lines, but the recent introduction of white light supercontinuum (WLS) sources has provided much greater freedom [1,2]. The combination of the WLS source with spectral detection has provided further versatility for confocal fluorescence microscopy [3,4].

We demonstrate the use of a WLS source in a reflection mode confocal microscope incorporating spectral detection. The microscope provides images resolved spatially in three-dimensions, in addition to spectral resolution covering the wavelength range 450-650nm. This has enabled the imaging of specimen features that are not apparent in laser illuminated confocal microscopy or conventional microscopy.

We present pseudo real colour images and reflectance spectra of a range of specimens showing detailed spatial and wavelength resolution (Figure 1). The specimens include thin film structures on semiconductor chips, iridescent structures in *papilio blumei* butterfly scales, nacre from abalone shells and opal gemstones.

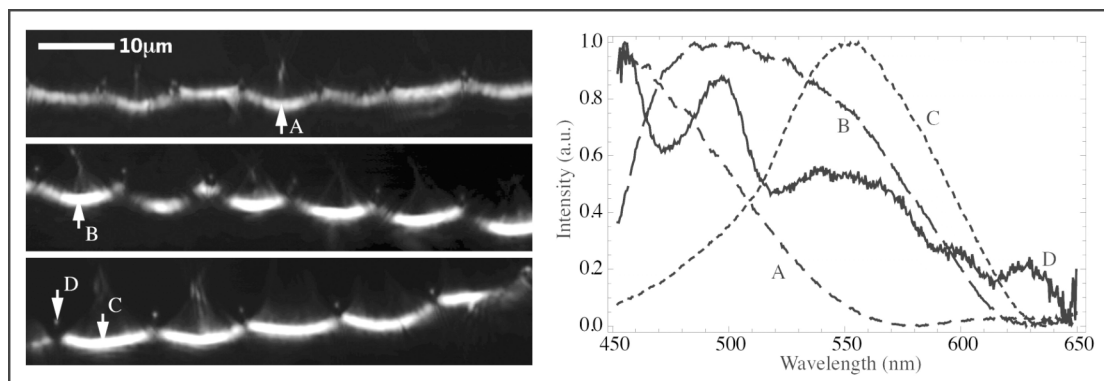


Figure 1: x-z confocal images of *papilio blumei* butterfly scales with the corresponding reflectance spectra from four points labeled A-D.

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