

A FIBER-OPTIC CONFOCAL SCANNER FOR SCATTERING TISSUE

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ABSTRACT

Confocal microscopy has become an important diagnostic tool in examining scattering tissues. The high resolution of confocal microscopy and its optical sectioning capabilities lend itself as a desirable modality in examining structures on the micrometer scale. While commercial confocal microscopes are readily available, they may not be suitable for examining tissues *in vivo* or able to accommodate large samples. The presented work offers a prototype device based on the principle of confocal microscopy that is versatile enough to be used not only as a small scale scanner, but adaptable for a wide range of situations. The automated capabilities of the scanner allow it to be used as a method of thickness measurement for tissue-engineered cell sheets, *in vivo* examination of skin, and determining homogeneity in scattering tissues. The abilities and shortcomings of the device are investigated, and future adaptations of the device are proposed.