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ONLINE ISSN : 1349-6603

PRINT ISSN : 0387-0200

## The Review of Laser Engineering

Vol. 31 (2003) , No. 10 p.635

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### Optical Coherence Tomography: Principles and Applications

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(Received: July 29, 2003)

**Abstract:** Optical coherence tomography (OCT) is an emerging technology for performing high-resolution cross-sectional imaging. OCT is analogous to ultrasound, except that it uses light instead of sound to generate images of tissue with micron-scale resolution. OCT can be used as a type of “optical biopsy,” because it provides images of tissue pathology *in situ* and in real time, without the need to excise and process specimens, as it is done in conventional excisional biopsy and histopathology. OCT promises applications in a wide range of clinical situations: to image tissue where standard excisional biopsy is hazardous or impossible, to guide surgical procedures, and to reduce sampling errors associated with excisional biopsy. This article reviews the principles and applications of OCT.

**Key Words:** [Optical coherence tomography](#), [Biomedical imaging](#), [Microscopy](#), [Interferometry](#), [Femtosecond optics](#)

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J.G. Fujimoto: The Review of Laser Engineering, Vol. **31**, (2003) p.635 .

