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Intended to provide a unified synthesis of the subject as well as to stimulate research (particularly multidisciplinary research), this introduction focuses on optical probing, diagnostics, and light-activated therapies, while also covering biomaterials and bioderived materials. The first few chapters review the principles necessary to understand and study the interaction of light with biological matter, including the fundamentals of light and matter, cellular structures and processes, and principles of lasers. Later chapters cover current and future applications and research, such as in vivo spectroscopy and optical biopsy; optical bioimaging and biosensors; DNA, protein, and cell microarray technology; flow cytometry as a clinical, biotection, and research tool; and new biological tools such as laser tweezers and laser scissors. Contact information is provided for a few commercial sources of instrumentation and supplies.

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