Confocal laser scanning microscopy: I. an overview of principle and practice in biomedical research.

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Abstract

Evolving from conventional microscopic technologies, confocal microscopy has proved itself to play an important role in the biomedical research during the past decade. Confocal microscope has many advantages over traditional microscope including the ability to look deeply into inside cells with less photodamage and photobleach, reconstruct three-dimensional images, and chart intracellular dynamic events in the living cells. With these remarkable properties and the availability of fluorescent dyes for living cells, the confocal microscopy has been widely used in solving many unknown questions in biological and pharmacological fields. In clinics, confocal microscope has also served as an important tool to observe the living cells in skins and eyes. For anesthesiologists, confocal microscope has made possible novel experimental approaches for the effects of multiple anesthetic agents on cells. Furthermore, the technology of fibreoptical confocal endomicroscopy is now on its way of maturation. It will soon be the era for confocal microscopy to explore the "cell behavior" inside of intact living tissues.