

3-Axis Side-View Confocal Fluorescence Endomicroscope

TECHNOLOGY NUMBER: 7568

OVERVIEW

Miniature imaging instrument for endoscopy

- Fluorescent confocal capability
- Additional 3D axis side view

BACKGROUND

Endoscopy is a commonly used technique through which medical a doctor can use a scope to look inside the body and take detailed pictures of tissues. An advancement on this technique is fluorescence confocal microscopy where histology-like images can be obtained in real time to produce an optical biopsy which can be used for disease diagnosis and prognosis. Many of these endomicroscopes utilize small and flexible fiber bundles, and which therefore permit use in smaller spaces such as the biliary tree. Still, drawbacks to this approach include front-only optics as well as visualization that is limited to the horizontal plane. As such, a need exists for improved endoscopic equipment to optimize its usefulness.

INNOVATION

Researchers have created a novel miniature imaging instrument to alleviate some of the current limitations of fluorescence endomicroscopy. This confocal endomicroscope utilizes a microelectromechanical systems (MEMS) mirror and compact lens for optical sectioning. This system allows for a 3-axis side view as well as the standard front view seen in most confocal endomicroscopes. From the images obtained by this device, three-dimensional structures can be recreated to provide a better understanding of the tissues and the areas being visualized. In addition to visualizing the horizontal plane, this device can also visualize the oblique plane. Furthermore, in vivo samples of mouse adenomas have been scoped with this device at higher resolution than with existing fiber bundle based endomicroscopes. This device is miniature and fits inside the standard biopsy channel of a medical endoscope. The configuration of this innovation also allows for scaling to even smaller sizes, if necessary, to fit in smaller places such as the biliary tree. This technology has the potential to allow for higher quality optical biopsies to be taken in real-time while documenting the diagnosis and treatment response of diseases.

PATENT APPLICATION

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Category

Medical Devices

Life Sciences

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