

Multifunctional Optical Probe

Technology #18022

Applications

This technology can be used in capturing optical images of body cavities, organs, as well as stimulate biological tissues.

Problem Addressed

Optical imaging of body cavities and optical stimulation of biological tissues are often considered as two separate procedures. The endoscopy-based optical imaging requires endoscopes that are relatively large in size with a limited structural flexibility and a small field of view. Alternatively, the optical-fiber-based neuromodulation requires waveguide arrays to stimulate multiple spatial site. These arrays have similar challenges to endoscopes of increased size, mechanical rigidity, and limited invasiveness to biological tissues.

Technology

This technology allows a dual-functional optical probe that operates both as optical imager and multi-site stimulating probe. The working principle for this device is based on the optical reversibility in which the spatially resolved imaging or stimulation function is attained via mode division multiplexing in a light guide or waveguide structure. The probe consists of a light source array, an imaging pixel array, an optical mode multiplexer/demultiplexer, segmented waveguides, and multiple optical elements.

Advantages

- Multifunctional probe
- Minimally invasive
- Small probe size
- Wide field of view
- Multi-site stimulation
- Low optical loss
- The light source and the biological tissues are thermally isolated

Categories For This Invention:

Medical Devices

Diagnostic

Life Sciences

Clinical Applications

Neurology

Tissue Engineering

Diagnostics

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Microarray

Microfluidics (Diagnostics)

Instrumentation

Microscopy

Intellectual Property:

Apparatus, systems, and methods for biomedical imaging and stimulation

PCT

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Apparatus, systems, and methods for biomedical imaging and stimulation

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