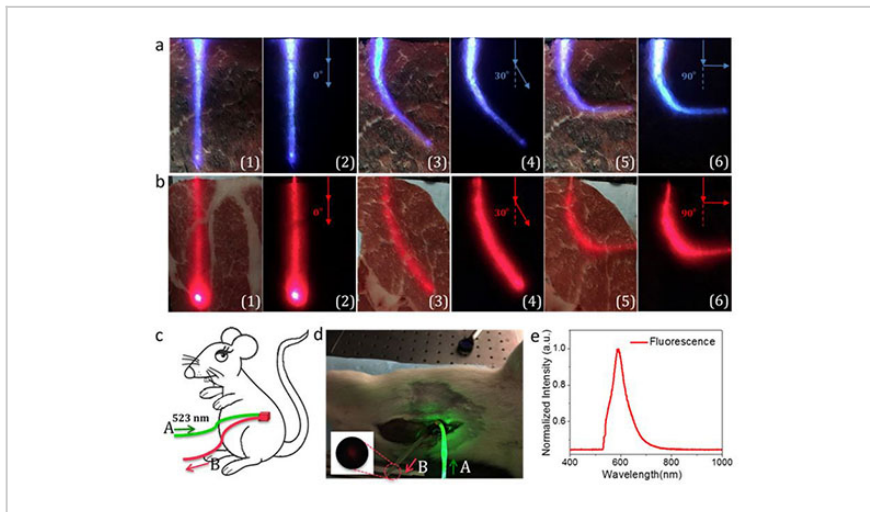


Biocompatible and Biodegradable Polymer Fiber Optical Waveguides

ID# 2016-4517



Flexible, Biodegradable Optical Fibers

Technology Summary

This technology is a flexible polymeric step-index optical fiber which can be implanted within tissues for delivery and/or collection of light to permit deep tissue imaging and sensing. The design of the optical fiber permits an ultra-fine tuning of the refractive index difference between the core and cladding while maintaining virtually the same polymer background. The optical fiber is biocompatible and completely biodegradable. The figure shows blue (a) and red (b) light delivery through a fiber under a thin porcine tissue slice at various bending angles, as well as a schematic (c) and photograph (d) of in vivo deep tissue fluorescence detection with these fibers (collected fluorescence spectrum shown in e).

Application & Market Utility

This patent-pending technology is believed to be the first biocompatible step-index optical fiber to be implemented entirely using a single materials platform, which has many advantages such as seamless integration of the core and cladding for high device integrity, ultra-fine tuning of their refractive indices, and simultaneous integration of optical, mechanical, and biological functionalities that cannot be achieved by any existing biodegradable optical fibers. This technology is particularly well-suited for surgical, sensing, imaging, and therapeutic applications.

Next Steps

Seeking research collaboration and/or licensing opportunities.

TECHNOLOGY READINESS LEVEL

4-7

Seeking

Licensing | Research

Keywords

- implantable
- optical fibers
- elastomers
- sensing
- imaging

Researchers

Jian Yang, PhD

Professor of Biomedical Engineering

[Website](#)

Zhiwen Liu, PhD

Professor of Electrical Engineering

[Website](#)

Dingying Shan, PhD

Research Assistant

Other Researchers

Chenji Zhang, PhD

Originating College

College of Engineering

Office of Technology Management Contact

Yan, Bin

byan@psu.edu

814-865-6277



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