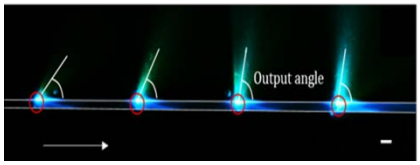
Fabrication Method & Applications
of Multiple Side-Firing Optical Fiber



Summary

An innovative method for creating an optical fiber capable of light emissions at multiple radial sites along the fiber. Traditional optical fibers only have light delivery at the end of the fiber, which is not ideal for applications, such as neural probes, where light is needed at multiple sites. This unique method utilizes laser micro-machining to create small windows on the sides of the fiber that emit light. Using this method, optical fibers can be specially designed with light emissions at desired locations along the fiber, power outputs required for the application, and preferred output angles. The Houston Methodist Research Institute is currently conducting research and testing this technology as a neural probe in animal models for regenerative medicine applications.

Competitive Advantages

- Capable of emitting light at multiple sites along an optical fiber
- Less invasive for medical applications than current technologies
- Able to create a variety of window sizes and locations for different applications
- Cost-effective method for producing side-firing optical fibers

Problem Addressed

- Traditional optical fibers are not capable of delivering light at precise locations along the fiber
- LEDs are too large to use in nerve regeneration and neurological applications
- Nerve regeneration and neurological applications require light emission at multiple locations

Applications

- Nerve regeneration
- Neurological disorders
- Remote sensing

Patents

- Provisional patent No.: 62/381,730
- Non-provisional patent No.: US2017/049687

Publication

- Chih, W. et al (2017). Fabrication of Multipoint Side-Firing Optical Fiber by Laser Micro-Ablation. Optics Letters, 42 (9).

Meet the Inventor

Dr. Wei-Chuan Shih
Associate Professor, DEPARTMENT of ELECTRICAL & COMPUTER ENGINEERING

Research Interests:

- Nanobiophotonics
- Hyperspectral imaging
- Digital signal processing

Contact

Tanu Chatterji, PhD.
Technology Transfer Associate
oipm@Central.uh.edu | 713-743-0201
Case ID: 2016-010