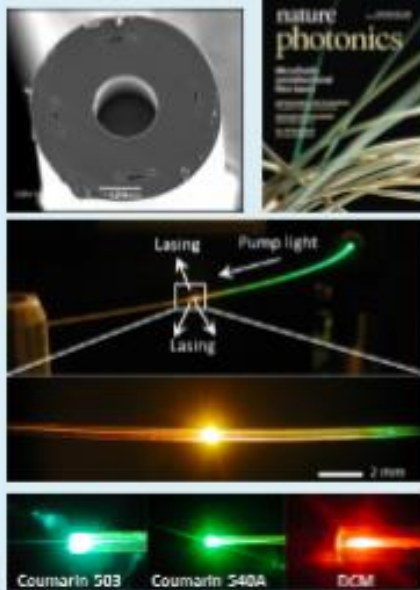


## Advanced Functional Fibers from Photonics to Biology and Nanotechnology

The main research interest of our lab is to fundamentally address the needs and challenges for scalable fabrication processes to produce flexible devices down to the nanometer-scale. The core technique is preform-to-fiber fabrication by thermally drawing a macroscopic solid-state preform into extended lengths of uniform fibers. This allows the fabrication of novel devices with unprecedented control over architecture, composition, and functionality on the extended fiber length scales from nanometer to kilometer range. The resulting fibers play a leading role in development of multidisciplinary solutions for precise biomedical treatments, energy harvesting, and distributed sensing systems in both single flexible fiber and multi-dimensional fabrics.

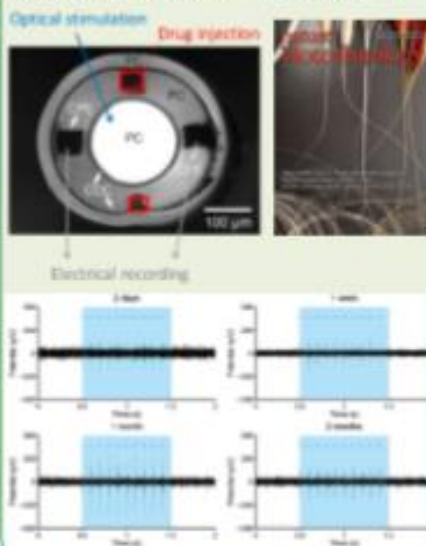
### Surface Emitting Laser

We design novel light emitting devices by integrating microfluidic channels into photonic bandgap fibers.



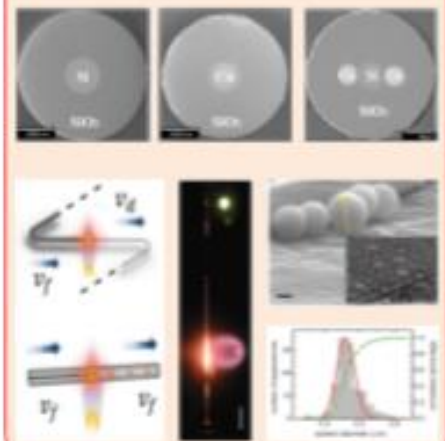
### Fiber-Neuron Interface

We design a neural probe for neural recording, optogenetic stimulation and delivery of pharmacological compounds, which is flexible and translatable.



### In-Fiber Fluid Instability

Using high-temperature fiber drawing ( $>1000^{\circ}\text{C}$ ), conventional electronic materials (e.g., Si, Cu) are being co-drawn into thin fibers. Post-draw processing is induced to control capillary instabilities, which enables nanostructuring of multimaterial fibers.



### Project Member

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