

Lighting up a photonic network inside a living body

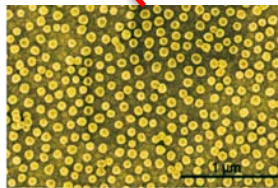
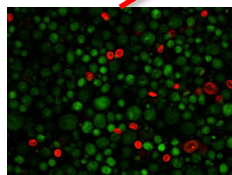
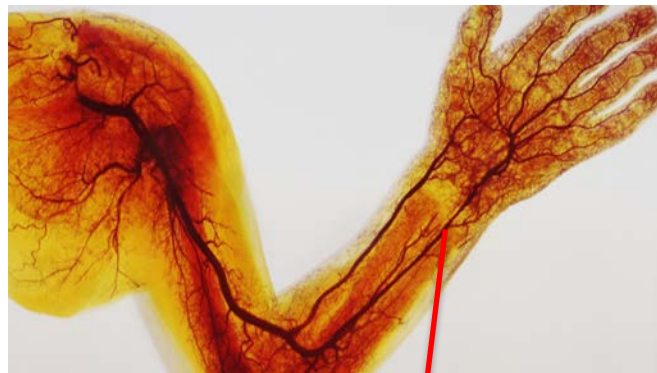
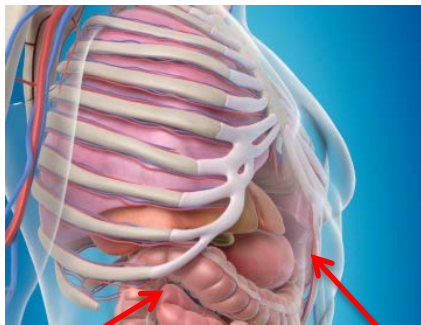
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There is a need for real-time imaging of the inside of a living body. For example, the exact position of bones in space to fix fractures and disfunctions. Light cannot penetrate inside living tissue because it is absorbed and scattered.

Guiding light into the body

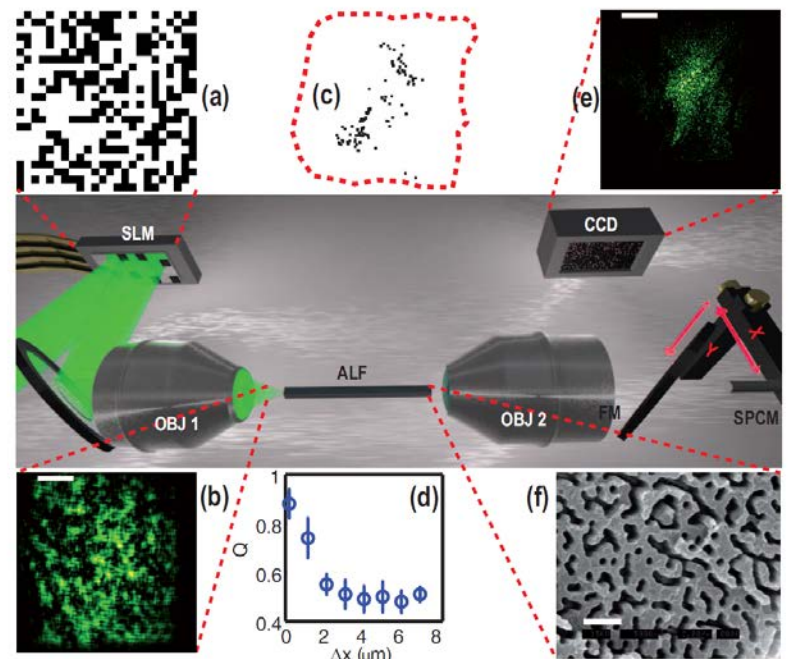
Imaging viscoelastic tissues and organs



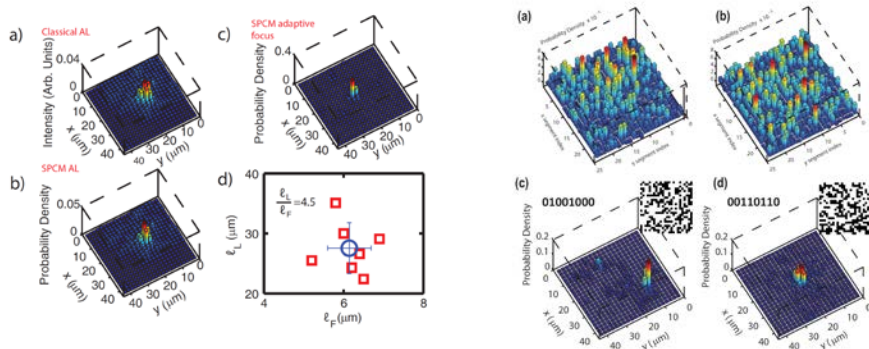
Fluorescence tagging

Gold nanoparticle tagging

The idea is to couple light into the body using adaptive optics and the body itself as a photonic infrastructure to achieve fluorescence and reflection infrared imaging at high resolution from the inside.



Experiments on Anderson localization in disordered PMMA fibers



Adaptive optics and localized transmission in disordered fibers

Potential impact is in the field of surgery, diagnostics, and in the understanding of the human body. A surgeon could evaluate the shape and deformations of an organ surface without having to operate.