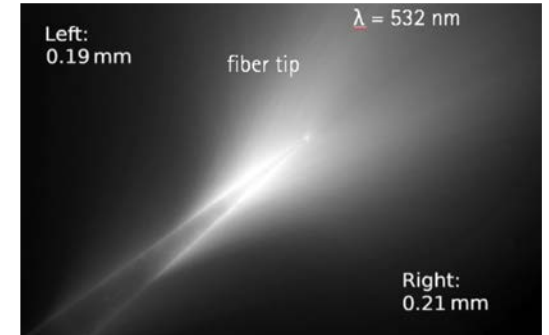
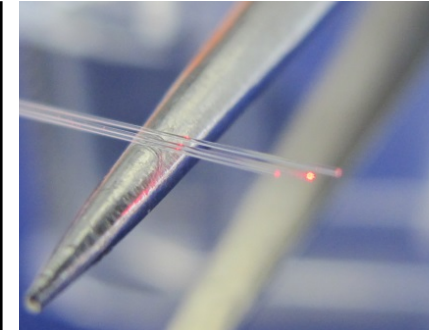
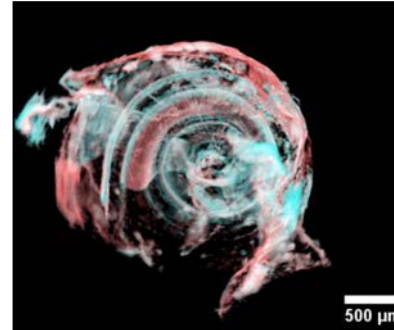
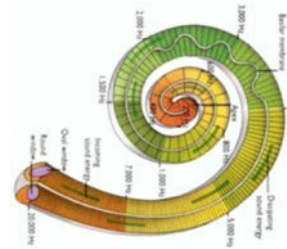
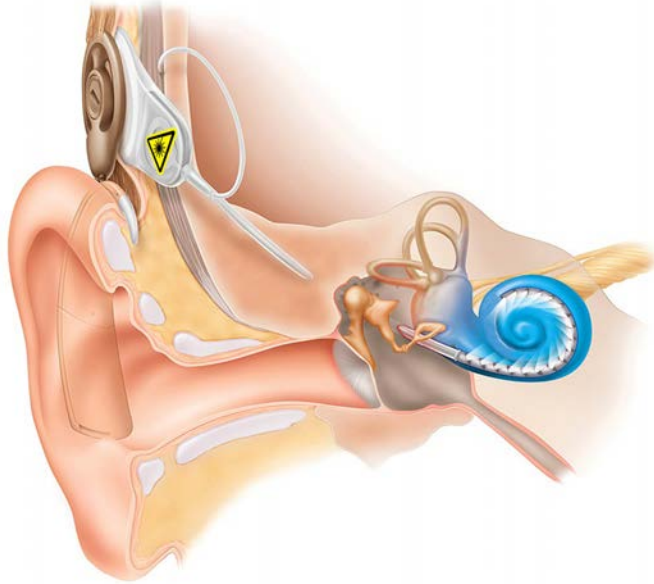
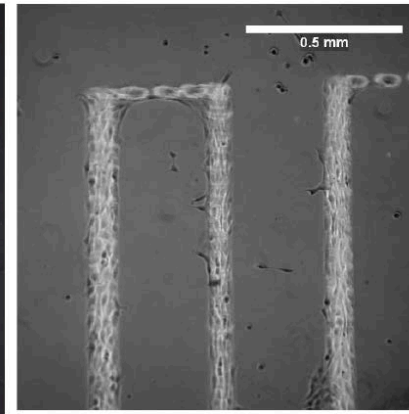
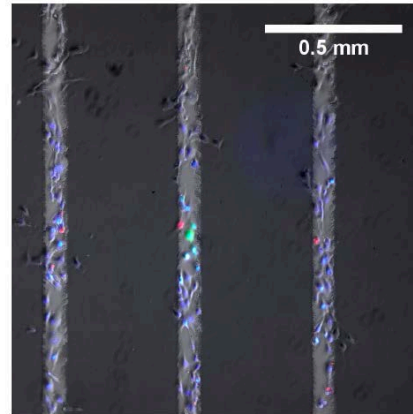
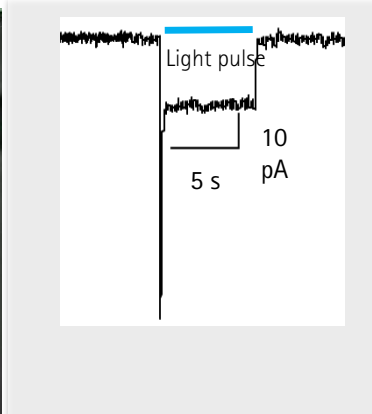
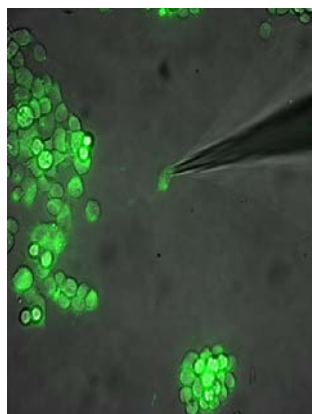


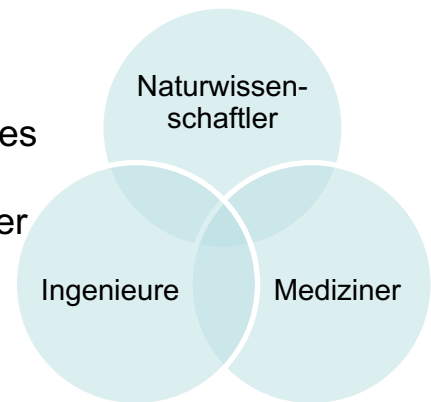
Untersuchen der optischen Stimulation des Innenohrs



- ▶ Untersuchen der Laser-Gewebe-Wechselwirkung im Innenohr
- ▶ Charakterisieren der Lichtausbreitung eines Faserbündels
- ▶ Messen der Schallausbreitung mittels Hydrofon und Schlierenmikroskopie



Interdisziplinäres
Arbeiten im
Exzellenzcluster
„Hearing 4 all“

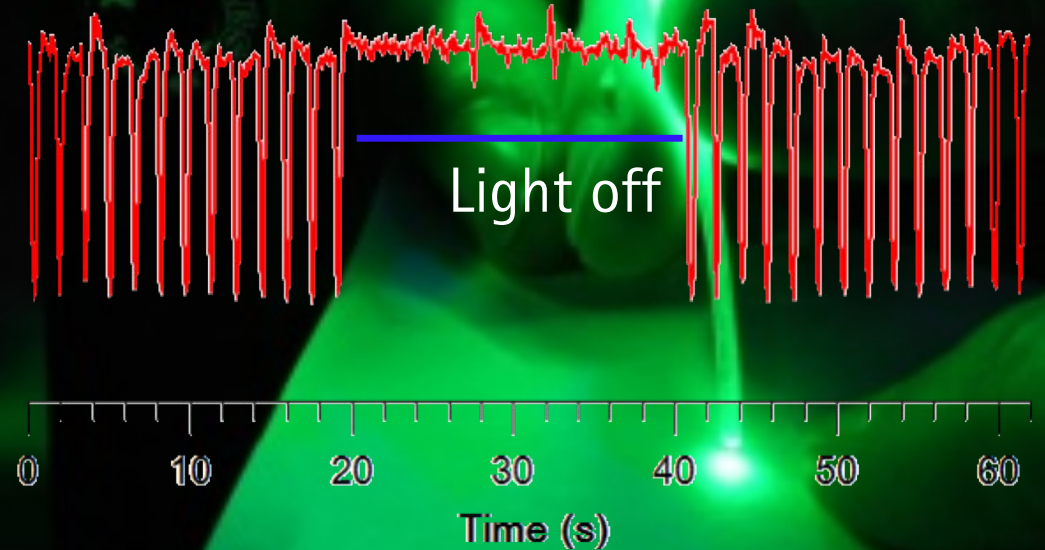
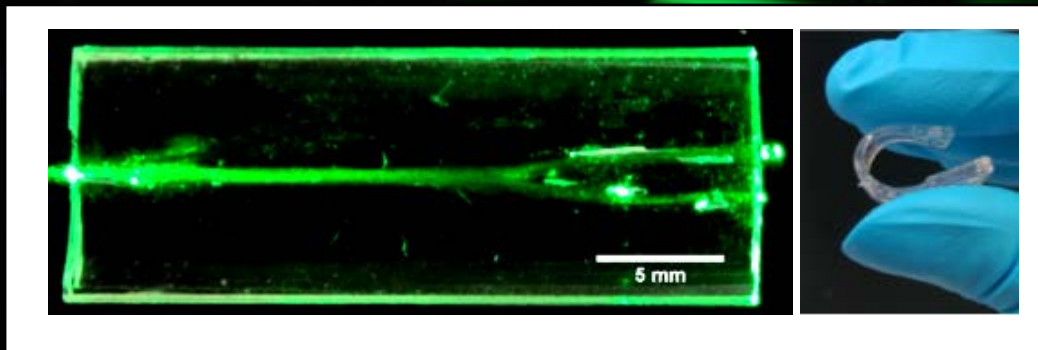


Defibrillator



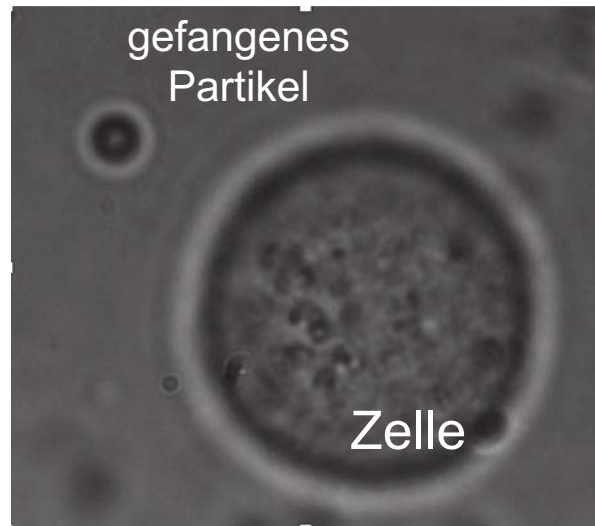
Optogenetik und optisch aktive Biopolymere

- ▶ Optische Induktion von zellulären Prozessen
- ▶ 3D-Tissue Engineering
- ▶ biokompatible Wellenleiter & opt. miniaturisierte Implantate/Wearables

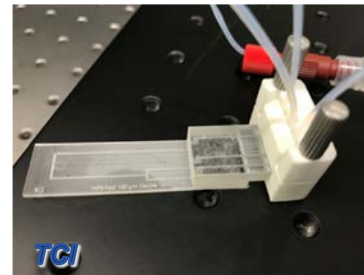


Entwicklung von neuen optischen Methoden zur Zellmanipulation

Optische Pinzette

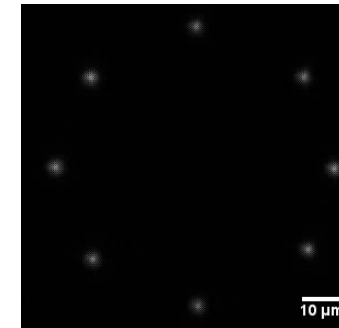
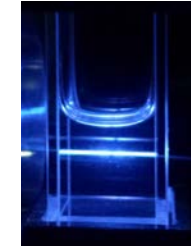


Verbindung mit
Mikrofluidik



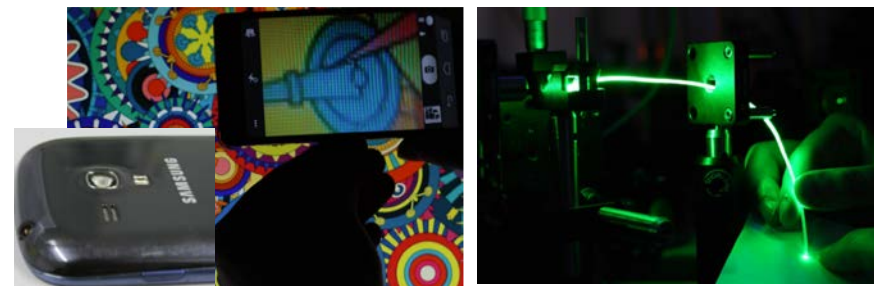
Nichtlineare Optogenetik

Upconverting
Nanopartikel



Femtosekunden-
Laser Beamlets für
Optogenetik

biokompatible Hydrogele

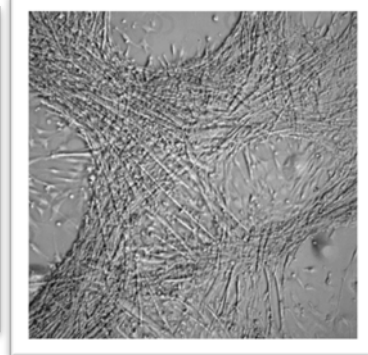


Als **Waveguide**,
Linse und **Fenster**
für die biologische
Anwendung

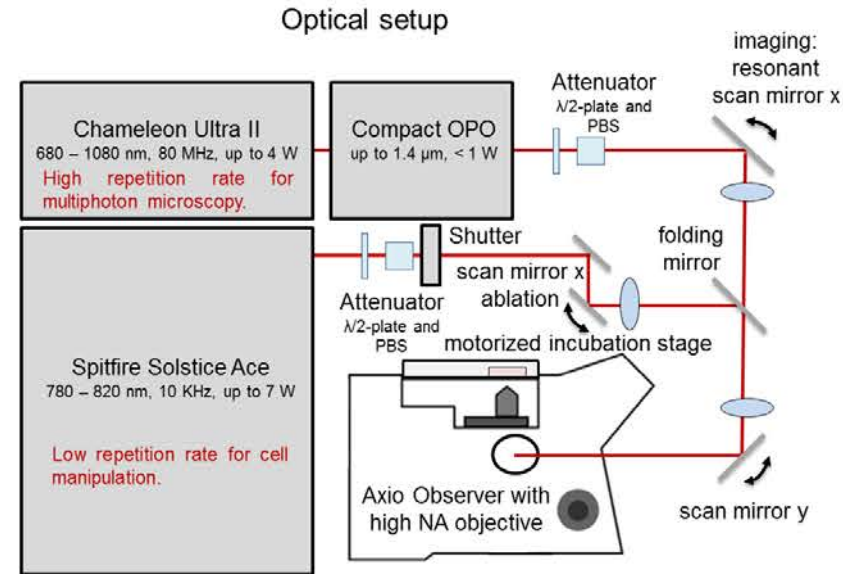
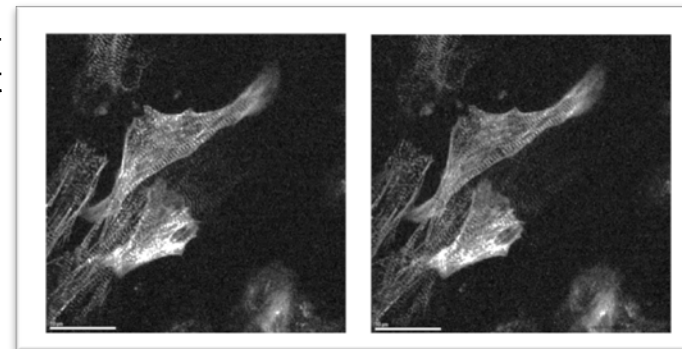
Mit Physik Regeneration verstehen

Der Herzinfarkt in der Petrischale!

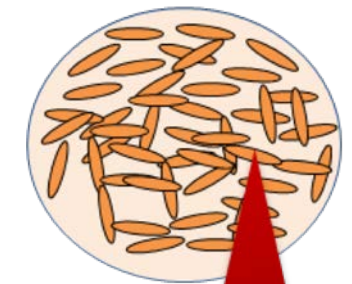
1. Nutzung von Herzzellaggregaten mit unterschiedlichen Zellen: Muskel, Endothel, Bindegewebe
2. Bildgebung mittels Multiphotonenmikroskopie
3. Laserablation von einzelnen Zellen



Muskelzellen – wie funktioniert Kraft?

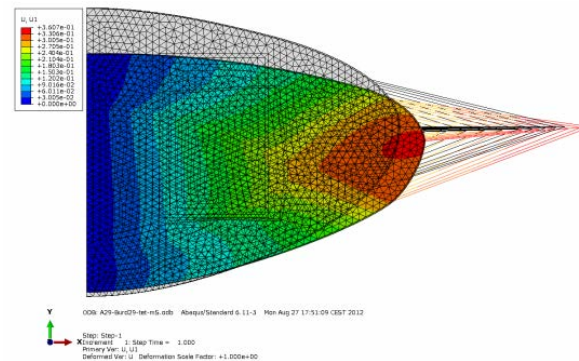
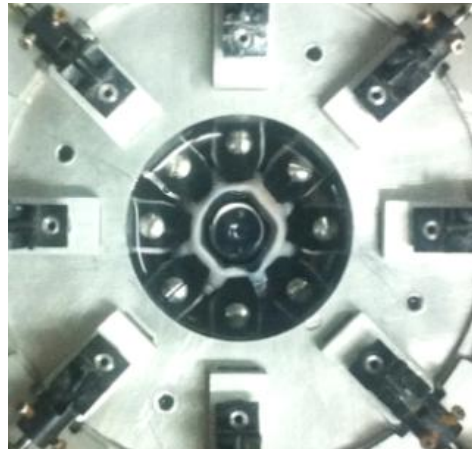
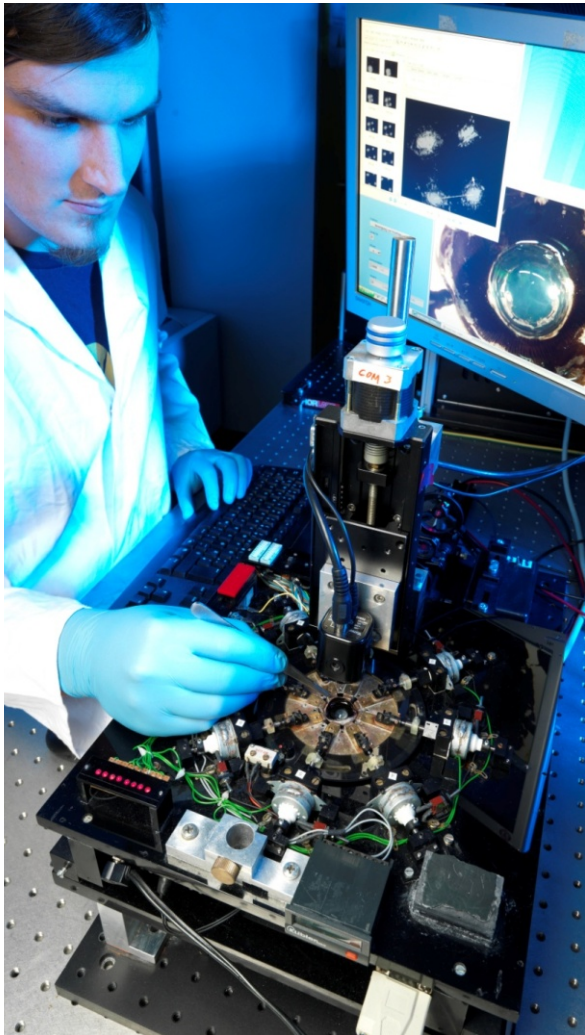


Optischer Aufbau

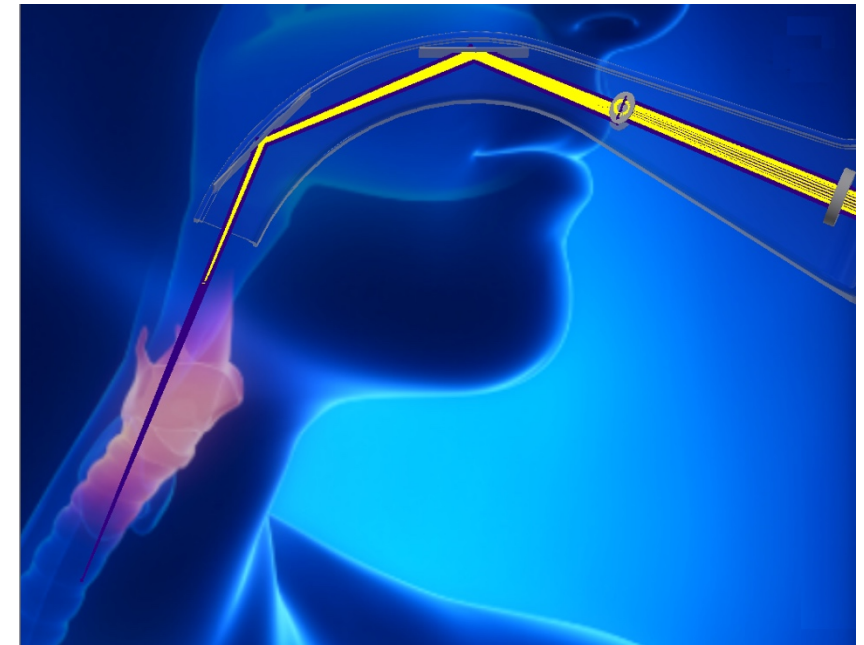


Laserablation weniger Herzzellen

Ultrakurze Laser in der Augenheilkunde und HNO



- ▶ OCT-Bild-geführte fs-Chirurgie am Auge und an Stimmlippen
- ▶ OCT mit Raytracing
- ▶ FEM Simulation
- ▶ ZEMAX
- ▶ Optische Aufbauten



Kontakt und Anbindung an die LUH

- ▶ Laser Zentrum Hannover e.V.
- ▶ Wissenschaftspark Marienwerder / Uni Campus Garbsen
- ▶ Abteilung Biomedizinische Optik
- ▶ Prof. Heisterkamp, Institut für Quantenoptik
- ▶ 5 PostDocs, 8 Doktoranden / WiMi, 12 Studenten
- ▶ Frauenquote: WiMi: 30 %; Studenten: ~ 50 %
- ▶ Vorlesungen: Lasermedizin, Biophotonik, (Photonik, Optik)
- ▶ Kontakt:

Alexander Heisterkamp — heisterkamp@iqo.uni-hannover.de

Tammo Ripken — t.ripken@lzh.de — www.lzh.de

www.biophotonics.uni-hannover.de

