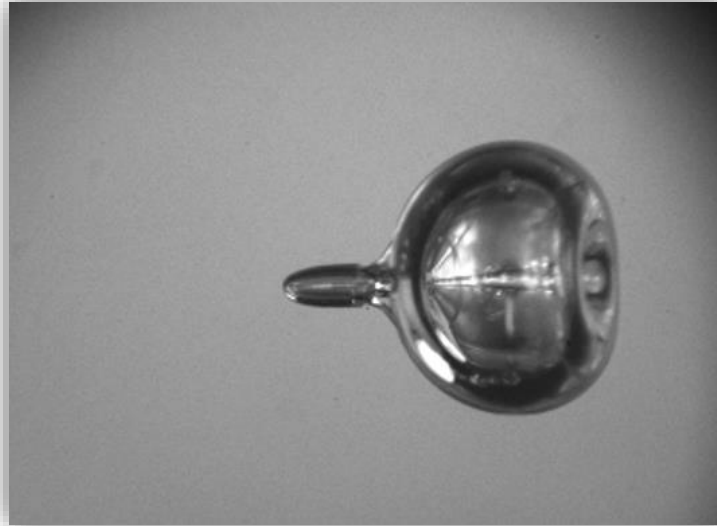
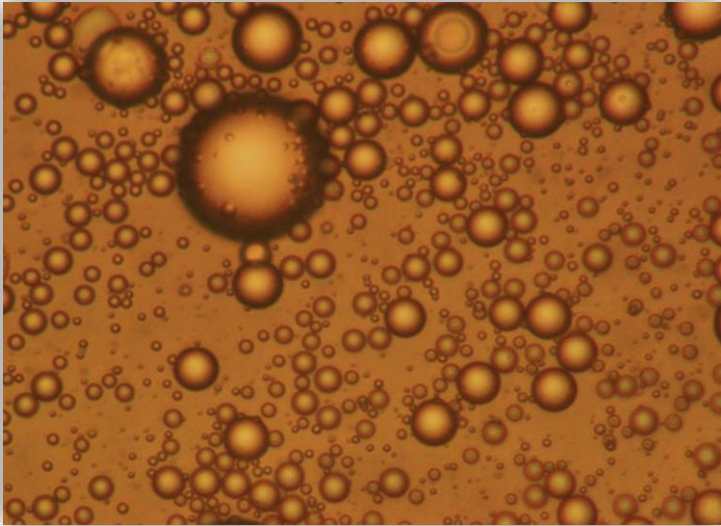


# Harnessing acoustically driven multiphase fluids

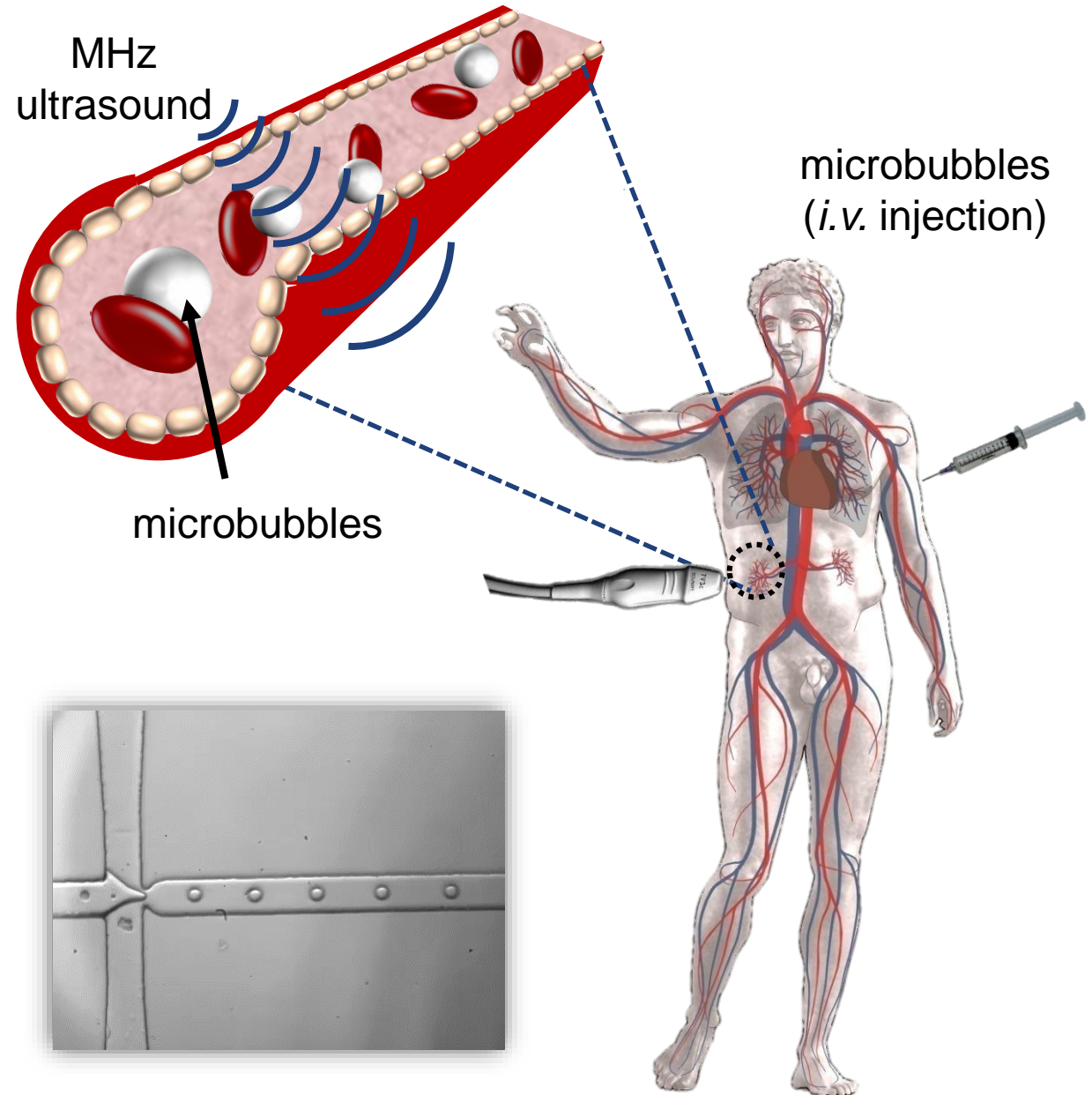
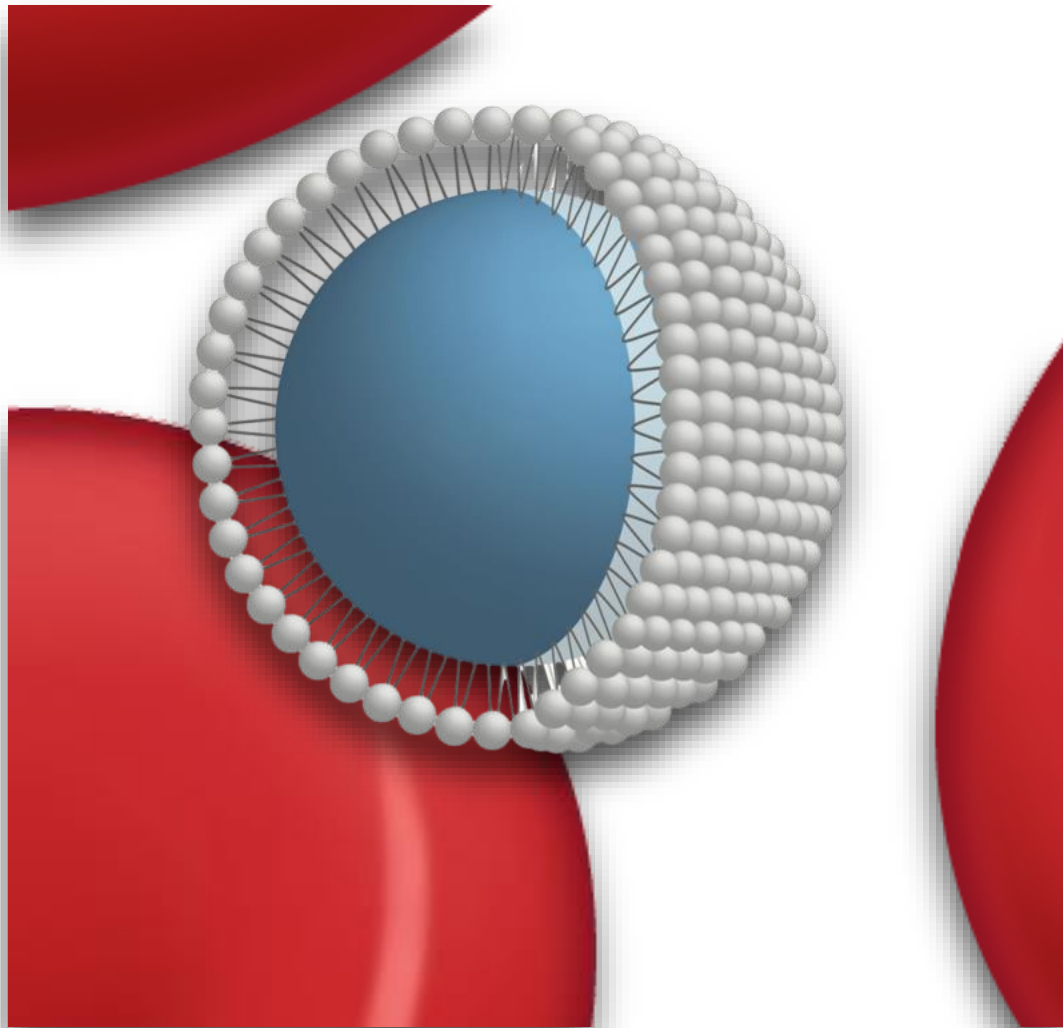
**Prof. Outi Supponen**  
ETH Zurich, Institute of Fluid Dynamics

# Bubbles, droplets, cavitation and underwater acoustics

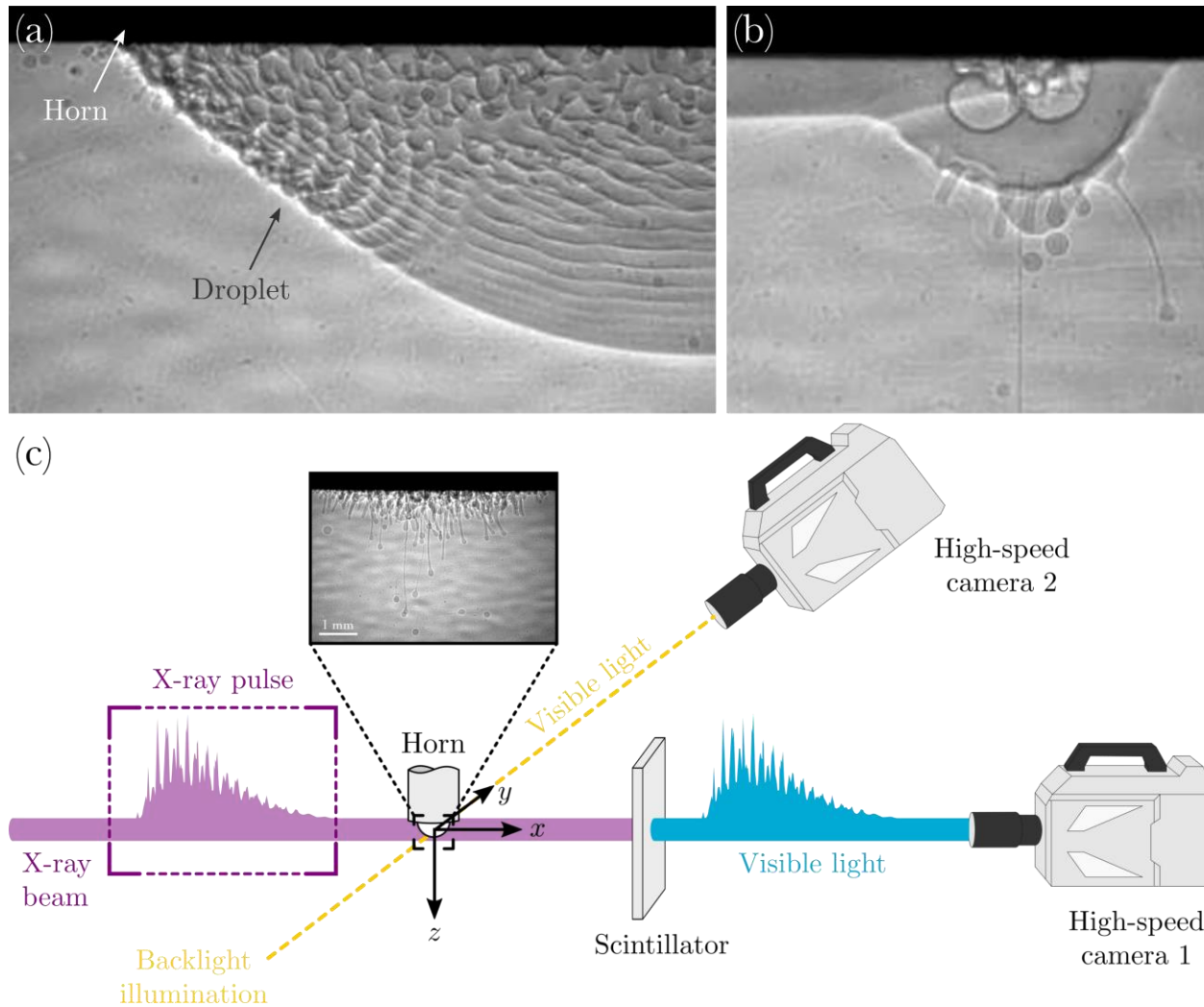


1. Engineering **complex bubbles and droplets**
2. Characterizing, modelling, and predicting their **dynamics under acoustic excitation**
3. Controlling **cavitation microdamage** for engineering applications

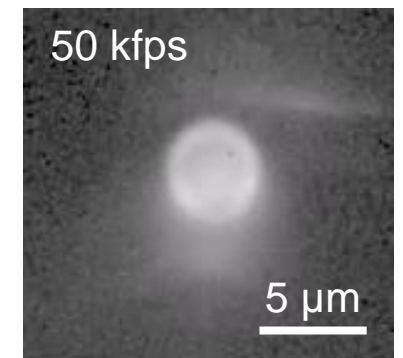
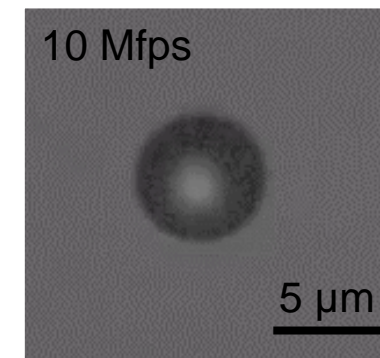
# Contrast for sound waves and vehicles for drugs



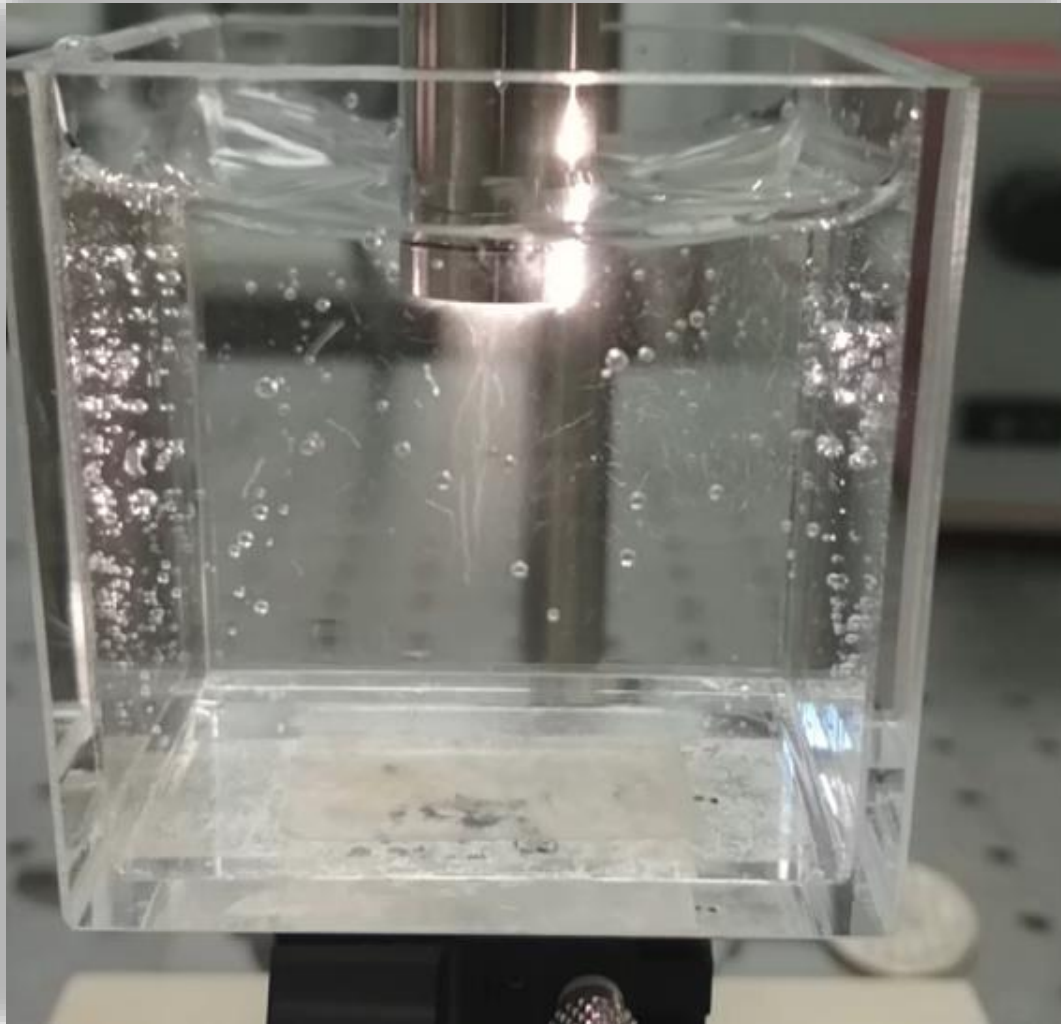
# Pushing the limits of ultrafast imaging



- Ultrafast X-ray imaging
- Ultrafast videomicroscopy
- Ultrafast fluorescence microscopy



# Leveraging cavitation micro-damage

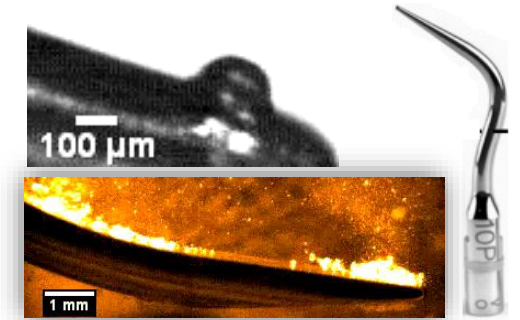


Enhanced  
bioadhesion

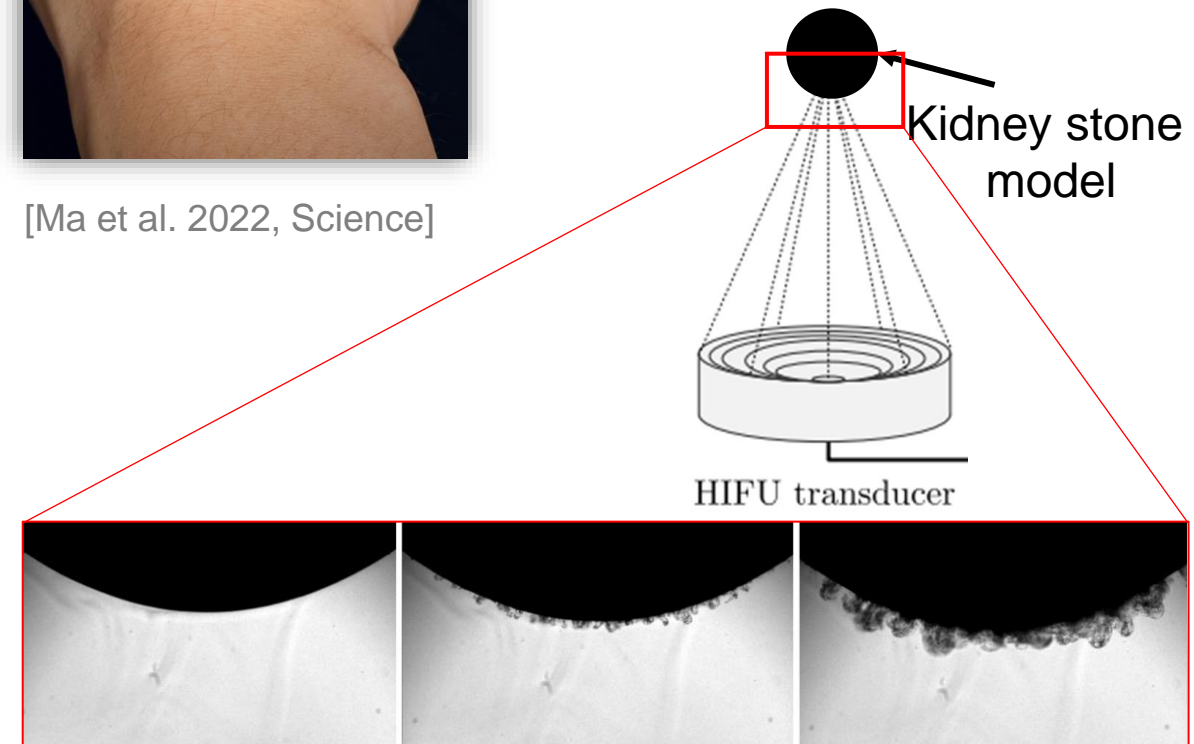


[Ma et al. 2022, Science]

Ultrasonic  
cleaning



[Vyas et al. 2016, PLoS One]



A microscopic image showing several cells, likely yeast or bacteria, with a distinct cell wall and internal granular structure. The cells are in various stages of division or budding.

**Thank you for your attention!**

**Prof. Outi Supponen**  
outis@ethz.ch

ETH Zurich  
Department of Mechanical and Process Engineering  
ML H 36  
Sonneggstrasse 3  
8092 Zurich