

## TECHNOLOGY OFFER

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# In-line holographic microscopy in a peristaltic tube

Microorganisms and microparticles can be detected using in-line holographic microscopy combined with microfluidics to exchange the sample. Often, experiments with microfluidics are challenged by mixing at the connection between different components, such as the pump, tubing, and a microscopy capillary. These issues can be avoided.

### BACKGROUND

Analyzing a flow of liquid with a microscope for the presence of bacteria or larger microorganisms requires a pump and a capillary in which the sample is analyzed. Assembling the capillary and then connecting it to the tubing is labor intensive and, importantly, compromises the hygienic conditions of the capillary.

### TECHNOLOGY

A simple solution to this is to omit such connections. In case a transparent peristaltic tube is used in a peristaltic pump, the same tube can be used to perform in-line holographic microscopy. In Figure 1, a tube is compressed on camera chip by means of a standard microscope slide. By shining coherent light through the tube, onto the camera chip, holograms consisting of the interference of light scattered by any dispersed objects in the tube with the un-scattered fraction of the illuminating light can be recorded.

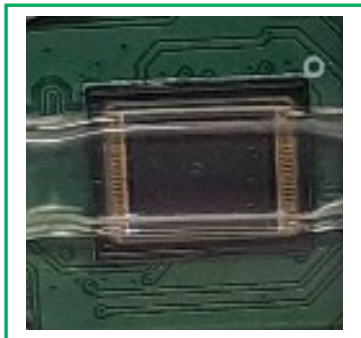


Figure 1 Imaging in a peristaltic pump tube

A peristaltic tube is flattened but not totally closed by pressing a microscope slide on top of a CMOS chip.

### BENEFITS

- Keeps everything in contact with the sample flow sterile.
- Easy exchange of all the surfaces in contact with the sample.
- Enables integrated devices performing pumping and imaging.

#### AVAILABLE FOR:

R&D cooperation  
License agreement

#### KEYWORDS/

#### APPLICATIONS:

In-line holographic  
microscopy, hygiene  
screening

#### DEVELOPMENT STATUS:

Prototype

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