

Holographic Phase Contrast Microscopy

BACKGROUND

Phase contrast microscopy is a much-used label free technique to visualize individual cells in microbiological samples, but the depth of focus and throughput are limited. On the other hand, flow cytometric analysis of populations is often used to get more statistical information on characteristics that are unfortunately less tangible. This limits the available information on cell and bacterium populations as well as of other (bio-) colloids.

TECHNOLOGY

We developed a technique that combines the best of both imaging and cytometry. We record the interference between light scattered by e.g. bacteria in a flow and the illuminating light. Using the principles from holography we then calculate the full light field which allows us to quantify throughout the sample how much light was scattered. This allows us to locate individual organisms, quantify the amount of scattering - related to their dry mass - as well as their shape and orientation. Since all this information is obtained from a single snapshot, we can further track the individuals in 3D to characterize dynamic properties such as diffusion, sedimentation and propulsion. By considering the positions during accelerations we can moreover measure interactions with different substrates or between individuals. By analyzing recorded movies we can obtain population wide statistics on these meaningful properties.

OUR OFFER

We seek partners to develop applications in medicine, biotechnology, food industry and cosmetics or other fields that use Cytometry and would like to know more about the sub-populations they find.

BENEFITS

- Label free, full volume, full population-individual based analysis
- Simple optics
- Continuous flow analysis possible
- Possible information includes size, dry mass, color, shape, diffusivity, speed, orientation and rotation

REFERENCE:
2018-02

AVAILABLE FOR:
R&D cooperation
License agreement

**KEYWORDS/
APPLICATIONS:**

- Cytometry
- Population based analysis
- (3D) Microscopy
- Holography
- Tracking analysis
- User Interface

DEVELOPMENT STATUS:
Prototype

IPR:
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