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【906】 Combined optical and acoustic trapping for optical tomography

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Exploiting the benefits of the two types of forces from optical and acoustic trapping schemes in a single setup allows us to manipulate biological samples in a contact-free and non-invasive way. With our system we levitate sub-millimeter sized samples in solution on a microfluidic chip compatible with various optical imaging techniques. We have developed a 3D ultrasonic resonator with custom made transducers to optimize the acoustic power transfer and controllability. The combination with optical tweezers allows for force estimations, increased precision in patterning, manipulation and induced rotation of the sample for optical tomography. Long-term monitoring of samples without mechanical confinement would potentially be a valuable tool for studying embryos, cell clusters and organoids for development- and drug-screening purposes.

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