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über

Optical and acoustic forces for tomographic imaging of biomedical samples

Abstract:

Tailored optical and acoustic fields can exert controlled forces on microscopic biomedical samples in suspension in a non-contact way. Large and therefore heavy particles, such as mm-sized cancer spheroids and organoids, can only be levitated by acoustic forces - optical tweezers could not handle them without adverse high-power effects. A particularly useful application of optical or acoustic forces is the ability to turn a captured sample around a chosen axis perpendicular to the optical imaging direction. This provides a contact-free way to accumulate the experimental imaging data required for artifact-free volumetric reconstruction, by avoiding the 'missing-cone' problem.

As an example, the 3D reconstruction of a sample levitated and rotated by acoustic forces and torques, optical coherence tomography (OCT) imaging of a zebrafish embryo will be discussed.

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