MP04-S2

08:50-09:10 **Room 203**

Chairperson(s): Yangmo Yoo *(Sogang University, Korea)*

Acoustic Tweezers for Single Cell Studies

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Recently, single cell studies are adopting non-contact tools for cell manipulation. Acoustic tweezers are a non-contact microstructure trapping tool using a highly focused sound field generated by a high-frequency (>10 MHz) ultrasound transducer. Single-beam acoustic tweezers (SBAT) may be implemented by a single transducer and the excitation system, eliminating the need for multiple complex transducers and their positioning system. SBAT can trap, move, press, or rupture a microstructure, including various cells and microparticles. It can generate a trapping force in the range from piconewtons (pN) to nanonewtons (nN) and a radiation pressure of several megapascals (MPa). SBAT may be used to characterize the mechanical properties of microspheres. The collapse pressure of a single hollow glass microsphere (HGM) was measured using a 20-40 MHz SBAT. Estimation of high-frequency acoustic pressure was developed based on the collapse pressure measurement to overcome the limitations of the conventional hydrophone measurements. Acoustic tweezers are a promising tool well suited to characterize the mechanical properties of a single cell/particle, which can lead to various in vivo applications of disease monitoring and treatment.