Theory and applications of acoustophoresis phenomenon in microchannels

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Acoustophoresis has been studied extensively over the past decade as a nondestructive and label-free method to manipulate particles and biological samples. The method involves the use of ultrasound standing waves to focus cells or particles in the nodal (or anti-nodal) plane of the standing wave according to their intrinsic properties: size, density, and compressibility. Microscale acoustofluidic devices are used increasingly in biology, environmental and forensic sciences, and clinical diagnostics. Examples include cell synchronization, enrichment cancer cells in blood, size-independent sorting of cells, non-contact microfluidic trapping and particle enrichment as well as acoustic tweezing.

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