

MICROFLUIDIC CULTIVATION AND LASER TWEEZERS RAMAN SPECTROSCOPY OF *E. COLI* UNDER STRESS

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Analyzing the cells in various body fluids can greatly deepen the understanding of the mechanisms governing the cellular physiology. Because of the variability of physiological and metabolic states, it is important to be able to perform such studies on individual cells. Therefore, we developed an optofluidic system in which we precisely manipulated and monitored individual cells of *Escherichia coli*. We used laser tweezers Raman spectroscopy (LTRS) in a microchamber chip to manipulate and analyze individual *E. coli* cells. We subjected the cells to antibiotic cefotaxime, and we observed the changes by the time-lapse microscopy and Raman spectroscopy. We found observable changes in the cellular morphology (cell elongation) and in Raman spectra, which were consistent with other recently published observations. We tested the capabilities of the optofluidic system and found it to be a reliable and versatile solution for this class of microbiological experiments.

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