Microfluidic device for continuous single cells analysis via Raman spectroscopy enhanced by integrated plasmonic nanodimers

In this work a Raman flow cytometer is presented. It consists of a microfluidic device that takes advantages of the basic principles of Raman spectroscopy and flow cytometry. The microfluidic device integrates calibrated microfluidic channels where the cells can flow one-by-one, allowing single cell Raman analysis. The microfluidic channel integrates plasmonic nanodimers in a fluidic trapping region. In this way it is possible to perform Enhanced Raman Spectroscopy on single cell. These allow a label-free analysis, providing information about the biochemical content of membrane and cytoplasm of the each cell. Experiments are performed on red blood cells (RBCs), peripheral blood lymphocytes (PBLs) and myelogenous leukemia tumor cells (K562).

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