Light sheet-based flow cytometer with ability to obtain images and retrieve objects from the whole blood

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Abstract Text

The new type of flow cytometer to image and capture fluorescent-labelled objects with magnetic sorting that works with whole undiluted blood was developed. Optical design of imaging cytometry part is based on well-known SPIM-Fluid [1] opensource construction. Flow cell with magnetic capture and sorting based on permanent rare-earth magnet was used to retrieve objects from the blood flow or some other media. The overall performance of the device was tested both in vitro and in vivo shunting two large blood vessels of laboratory animals. Objects captured from the blood flow can be later characterized by a broad reach of in vitro measurement methods. It opens new horizons for searching rare objects like circulating tumor cells in the blood flow and pre-clinical testing of targeted drug delivery carriers.

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