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Lateral flow microfluidic device for concentration of cells sub-populations

The present study regards a microfluidic device for separating and/or concentrating a sub-population of particles from a biological fluid. The device is based on later filtration. Microchannels are configured to withhold or separate the target particles, for example ones having a certain shape, size or deformability, or given physical characteristics, whereas other particles are evacuated from the device. The idea was proposed for the first time in 2010 and later evolved to the present device characterised by

main channels separated by linear arrays of microchannels of 8 or 10 microns width, aspect ratio ranging from 0.8 to 1.2 depending on the application. A similar approach was recently used by Gifford et al. but with larger separation channels. The device was tested with different cells, like bacteria, yeasts and blood cells. In fig. 1 a particular of the microchannels with yeasts flowing in is reported. Examples of cells separation and enrichment will be presented.

Biography

Marco Pizzi received his degree in General Physics from University of Torino in 1996 and the PhD in Electronic Engineering from Politecnico di Torino in 2004. He is currently Research Director of the Eltek Group. From January to December 2010 Marco was Smart Materials Platform Team Leader, Centre for Human Space Robotics, IIT@polito, Italian Institute of Technology. From 2007 to 2010 was Techfab s.r.l. Research Coordinator. He was previously responsible for the activities on Sensors and Actuators at Fiat Research Centre. He authored or co-authored more than 90 papers and patents in the field of micro and nanotechnologies.

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