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Paper 101 BIODEVICES
11:30 - 13:00 Room Mosteirô
Parallel Session 6

USING MULTI-AGENT SYSTEMS TO STUDY PARACRINIENNE CELLS INTERACTION

Lynda Dib
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Keywords: Multi-agent model, System of multi-agent simulation, Agent interaction, Paracrinien communication.

Abstract: This paper presents our multi-agent framework for modelling and predicting the emergent behaviour resulting from the presence of distinct environmental conditions that lead to bad interaction of cells in their tissue. As the cellular interaction is an important behaviour permitting the survive of cells in their tissue, the objective of our simulator is to be a virtual world of cellular biology while analyzing and simulating the control mechanisms during the paracrinien communication between cells in order to help its specialists to better understand, to good interpret and to warn changes of cell states according to its actual internal state and to the state of its environment.

Paper 110 BIODEVICES
11:30 - 13:00 Room Mosteirô
Parallel Session 6

A MULTI-LAYERED MICROFLUIDIC DEVICE FOR MAGNETOPHORETIC CELL SEPARATION

Hye-Lyn Lee, Suk-Heung Song, Hee-Taek Lim, Hyung-Joon Kim, Min-Suk Park and Hyo-Il Jung
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Keywords: Multi-layered microfluidic channel, Magnetophoretic cell separation, Microelectromagnet, Microbeads, Magnetic field.

Abstract: In this paper, we present the design and experimental results of a multi-layered microfluidic electromagnetic cell separation device. Our channel consists of top and bottom layers in order to separate magnetically labeled cells in the vertical direction. Rapid separation of magnetic beads in top and bottom channel can be used in high throughput screening to monitor the efficacy and drug compounds. The experiments using the device were carried out with 4.5um magnetic bead and magnetic labeled Jurkat cell under electromagnetic field of 1.55mT. Without the magnetic field, the magnetic labeled cells started to flow from the bottom inlet and exit out of the bottom channel outlet. In the presence of the magnetic field, the cells started in bottom channel are attracted upward by the electromagnetic field and flow through the top layered. Finally, the labeled cells flow out the top channel outlet. The separation efficiencies of the multi-layer structured microfluidic channel showed more than 95%. We found that the multi-layer structured microfluidic channel was very effective in enhancing the separation. This microfluidic channel can be potentially applied to Lab-on-a-chip system because of its attractive features such as high throughput, continuous sorting, simple and rapid fabrication.

Paper 106 BIODEVICES
11:30 - 13:00 Room Régua
Parallel Session 6a

POLYISOPRENE – NANOSTRUCTURED CARBON COMPOSITE (PNCC) MATERIAL FOR VOLATILE ORGANIC COMPOUND DETECTION

Gita Sakale, Maris Knite, Valdis Teteris
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Keywords: Polymer-high structured carbon black composite, Volatile organic compound sensors.

Abstract: Our scientific group has chosen the elaboration of conductive composite material, which could be useful for volatile organic compound detection, as one of research areas. It was found out that the most sensitive composite material consists of polyisoprene and 10 mass parts of nanostructured carbon black. The electric resistance changes of the composite in presence of 10 different saturated organic solvents vapour were measured. Results obtained form our mass-sorption experiments indicated that electrical resistance of the composite increases because of volatile organic compound (VOC) molecule absorption in the composite matrix material. We also evaluated VOC compatibility with PNCC matrix material and estimated how the PNCC resistance change velocity (Vr) versus organic solvent vapour molecule diameter varies.