

LINKED-TECHNOLOGY OPPORTUNITY

Synergistic Solutions from Networked Laboratories

A NON-CONFIDENTIAL / NO-OBLIGATION SUMMARY

B-212 MICROFLUIDICS TECHNOLOGIES

Self-enclosed microchannels/chambers; direct silicone patterning; & electrowetting-driven micro-pumping

Technology Description:

Microfluidics is important in all types of analysis including chemical and biological. The ability to design and build microstructures and ability to drive fluids through these microstructures makes these analytic tools so effective. Three technologies from the University of California advance the state-of-the-art in this domain:

UCLA researchers have developed a micropumping system which uses EWOD (electrowetting on dielectric film) as the dynamic actuation principle to cut and drive a liquid segment on a surface or in a channel. The system is divided into regions of electrodes, through which the liquid moves. Applying an electric potential between the liquid and the electrodes changes the hydrophilic or hydrophobic character of the region. This moves the liquid through the region, where it can then be separated into a smaller segment that can be driven sideways by sequential potential application. This results in a digitized fluidic circuit.

UCSD researchers have developed a resistless projection lithographic method for generating three-dimensional patterns on silicon substrates. A porous silicon layer is first formed by projecting an image or test pattern onto a silicon substrate during standard electrochemical etching. The porous layer is then removed in a wet etch revealing a 3-D image or test pattern in micrometer resolution. This technique does not involve the use of complicated, multi-step lithography or mask aligners. It is also very quick; a multilayered master can be made from a computer design in less than 60 minutes. Feature sizes of 70 microns have been demonstrated, but smaller features should be possible.

UCI researchers have developed a method of fabrication of self-enclosed microchannels and/or chamber with or without integrated interconnects and electrodes. The UC method allows reduction in costs and time because only a single development step is required to define all the walls of the microfluidic device.

Intellectual Property:

These technologies are protected by at least two US Patent Applications and some corresponding foreign: 20030205632 & 20050009374; other rights may also pertain.

Applications:

- Microfluidics
- Biological and chemical assays
- Lab-on-a-chip

Additional Information:

For additional information or to initiate discussion of commercial interest, please contact:

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Technology Bundling Project

Funded by Ewing Marion Kauffman Foundation and administered by Larta Institute, the Project's expert panels examined technologies from 18 Southern California research centers and identified inventions which could be synergistically combined for unique solutions. These Linked-Solutions are now being offered for license, with reduced red tape and "1-stop technology shopping".



Combination Benefits

- Self-enclosed microchannels with or without interconnects and electrodes
- Direct patterning of Silicon by etching
- Electrowetting-driven Micro pumping