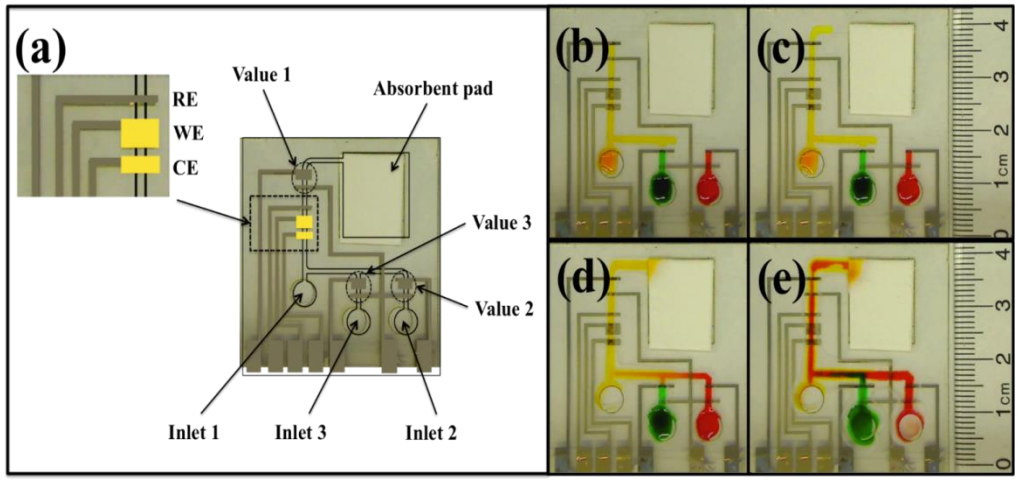
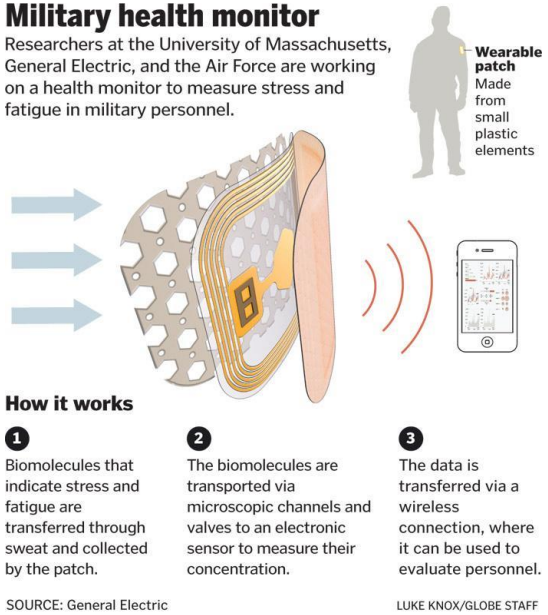
# Fabrication of Flexible Microfluidic Chip using Nanoimprint Lithography

A CHM team has demonstrated a method to fabricate a flexible microfluidic chip using UV-assisted nanoimprint lithography containing electrowetting valves developed by Nugen and electrochemical transduction. The chip is designed to be amenable to a roll-to-roll manufacturing system. Microchannels were structured on a PET film. The electrodes were inkjet-printed on the flexible PET films. The figure below shows the functionalities of automated fluid delivery and actuation of the multivalve system with food dye in PBS buffer. Numerous applications include low cost patch sensors for biomarker detection in sweat, which is employed in an independent project funded by the DoD NanoBioManufacturing Consortium to assess stress and fatigue in the warfighter. The latter project is conducted in collaboration with GE and other partners.




Boston Globe
8/4/2014

Left: (a) Schematic diagram of microfluidic chip consisting of three inlets, three electrode vales and three electrode system. WE: working electrode; CE: counter electrode; RE: reference electrode, Visual inspection of electrowetting on microfluidic chip using food dye solution (0.01 M phosphate-buffer saline solution with 5% food dye): photography of (b) yellow, green and red dye solution stopped on the valves, respectively, (c) yellow dye solution flowed after valve opened, (d) red dye solution flowed after valve opened and (e) green dye solution flowed after valve opened. (Ruler scale on the right side) Right: Article featuring the stress patch sensors that appeared in the Boston Globe 8/4/2014.

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