

## **Microfluidics design and fabrication for life sciences application**

### **Abstract**

This paper introduces a simple design and fabrication for microfluidics that need no external pumping power to delivery fluid into sensing domain with minimum sample available. Analysis using COMSOL 3.5 Multiphysics simulation and fabricated using soft-lithography technique were done. The design is based on differential pressure drop flow using capillary effect concept which has facilitated a number of interesting flow phenomena in micro-domains. For an average pressure drop of about 100/m in the setup, flow rates of bout 0.7 to 1  $\mu\text{l/s}$  were obtained. The component consists of a microchannel, two designs were tested (70 and 100 microns in width) to give a continuous open circuit flow. The system was designed and fabricated for continuous flow across sensing element where there is a requirement for low residence time due to fast reaction/diffusion rates.

### **Keywords**

Capillary effect; Comsol multiphysics; Fabrication; Microfluidics; Simulation; Soft lithography