
Textile-based Passive Microfluidic Channel for Handling of Biofluids

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Wearable biosensing devices for biofluid analyses such as sweat, wound exudate and interstitial fluid have been investigated for monitoring of personal health status. Detection of metabolites, ion or other biomolecules is of critical importance for non-invasive or minimally invasive detection. As an important component of the wearable biosensing systems, collection and handling device of biofluid samples which can easily evaporate need to be studied and the device requires mechanical conformality for attachment on human body. Here, the microfluidic channel technology based on biocompatible textile for biofluid handling is presented. A stretchable fabric is used as a capillary material inside thin polydimethylsiloxane channel. With simple fabrication process, low cost, use of abundant materials, highly stretchable microfluidic channel shows effective collection of liquid sample by its capillary action, complete replacement of liquid flows which is necessary for continuous flow and passive driving of liquid under stretching condition up to 30% without collapse.