

Abstract Submitted
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A PDMS based passive microfluidic device for generating Platelet rich plasma¹ VIJAI LAXMI, SIDDHARTHA TRIPATHI, SUHAS S JOSHI, AMIT AGRAWAL, Indian institute of Technology, Bombay, INDIAN INSTITUTE OF TECHNOLOGY, BOMBAY TEAM — Platelets are a pool of various growth factors which act as a soft tissue healer, and are also linked to various pathophysiological diseases. Platelet rich plasma (PRP) finds wide applications in platelet transfusion and biomedical research. Therefore, there is merit in selectively extracting platelets from blood. Clinically, platelets rich plasma is separated based on centrifugation process, which is however time consuming and leads to activation of platelets. The existing microdevices suffer from low throughput and have been tested only with dilute blood. Here, we design and test a passive PDMS based microdevice for obtaining PRP from whole human blood. The features involved in the microdevice are simple, and its fabrication involves a single layer of photolithography. The microdevice utilizes hydrodynamic forces for its operation, which are based on the biophysical laws and geometrical effects. The microdevice separates plasma with 14 - fold enrichment of platelets in it, while working in 0.2 ml/min to 0.4 ml/min flow rate range. The quality of the outlet sample is also checked by measuring the activation level of platelets, less than 5% platelets are found to be activated. These features make the presented microdevice unique.

¹Indian Institute of technology Bombay, Mumbai

Vijai Laxmi
Indian institute of Technology, Bombay

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