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7th World Congress of Biomechanics

July 6-11, 2014

John B. Hynes Veterans Memorial Convention Center
900 Boylston Street | Boston, Massachusetts 02215

Presentation Abstract

Session: 5-6-Biofluid Mechanics III

Presentation: Visualization and Measurement of Red Blood Cells Flowing in Microfluidic Devices

Location: 309

Presentation Time: Monday, Jul 07, 2014, 3:00 PM - 3:18 PM

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Abstract: Several experimental techniques were performed in the past years using in vitro environments, in an attempt to not only understand the blood flow behaviour in microcirculation but also develop microfluidic devices as an alternative clinical methodology to detect blood diseases [1-4]. Hence, the visualization and measurement of red blood cells (RBCs) flowing in a microfluidic device are important to provide not only essential information about hydrodynamic characteristics of the blood but also vital information to diagnose the initial symptoms of diseases during clinical investigations [5]. For instance, RBC rigidity has been correlated with myocardial infarction, diabetes mellitus, hypertension, and also other haematological disorders and diseases that affect RBC deformation more directly, such as, hereditary spherocytosis, sickle cell anaemia and malaria [6, 7]. Regarding a better understanding of the RBCs deformation and motion, we present in this paper a compilation of studies made in our research group, using several microfluidic devices with different microchannel geometries and fabrication techniques (i.e., soft-lithography, xurography and hybrids) that focus in the shear and extensional flow behaviour, either in healthy or chemically stiffed RBCs.

ACKNOWLEDGMENT
The authors acknowledge the financial support provided by 2007 Global COE Program "Global Nano-Biomedical Engineering Education and Research Network", Japan and grant-in-Aid for Science and Technology, PTDC/SAU-BEB/105650/2008, PTDC/EME-MFE/099109/2008, PTDC/SAU-[illegible]BD/91192/2012 and scholarship SFRH/BD/89077/2012 from FCT (Science and [illegible] EDER). The authors are also very grateful to Dr. Mónica Oliveira (Strathclyde University), Professor Takuji Ishikawa and Professor Takami Yamaguchi (Tohoku University) for their suggestions and support to this research work.

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