

Abstract Submitted
for the DFD10 Meeting of
The American Physical Society

Evaluation of RBC aggregation using synchrotron X-ray speckles¹

HOJIN HA, KWON-HO NAM, SANG JOON LEE, POSTECH, BBRC TEAM —
When a coherent beam illuminates spatially-disordered particles, speckles are usually generated by the interference of the scattered light waves. The speckle has been known to contain the information of the objects under near-field condition. In this study, we hypothesized that the speckle patterns of the red blood cells are related to the aggregation shape and the size of RBCs in the medium. The speckle patterns of RBCs in static condition were investigated by transmitting the monochromatic synchrotron X-ray beam to the sample with varying hematocrit(10-80 %) and medium type(phosphate buffered saline, autologous plasma and 0.75 % polyvinylpyrrolidone 360 in phosphate buffered saline). The temporal variation of speckle patterns after sudden removal of shear rate was observed by stopping the blood flow in a tube. The size of aggregated RBCs is closely correlated with the characteristic features of the speckle patterns.

¹This work was supported by the Creative Research Initiatives (Diagnosis of Biofluid Flow Phenomena and Biomimic Research) of MEST/NRF of Korea. X-ray imaging experiments were performed at 1B2 and 7B2 beamlines of Pohang Accelerator Laboratory (PAL), KOREA

Hojin Ha
POSTECH

Date submitted: 05 Aug 2010

Electronic form version 1.4