Abstract Submitted
for the DFD19 Meeting of
The American Physical Society

Development of margination of platelet-sized particles suspended in red cell suspension flows through Y-shaped bifurcating microchannels[1]
TENKI ONOZAWA, Graduate School of Kansai University, TOMA KAWAUCHI, JUNJI SEKI, TOMOAKI ITANO, Kansai University, MASAKO SUGIHARA-SEKI, Kansai University, Osaka University — In the blood flow through microvessels, platelets are known to have enhanced concentrations near the vessel wall, which is called margination or Near-Wall Excess (NWE) of platelets. At a bifurcation of vessels this preferential distribution of platelets would be impaired and gradually reconstructed again in the daughter vessels. The present study was aimed at analyzing the process of the reconstruction of NWE in the daughter vessel by *in vitro* experiments. We adopted platelet-sized fluorescent particles for platelet substitutes to measure the distribution of particles suspended in the red cell suspension flow through a microchannel of Y-shaped bifurcation, by use of a confocal laser scanning microscope – high speed camera system. In the parent channel just upstream of the bifurcation, particles showed fully developed NWE. Reflecting this distribution, the particles were located mainly near the outer wall at the inlet of the daughter channel, and exhibited a lateral shift from the outer wall to the inner wall until NWE was developed. Since the development length of NWE from the bifurcation was almost independent of the flow rate through the channel, the velocity of the lateral shift was suggested to be nearly proportional to the main flow velocity.

[1]JSPS KAKENHI 17H03176

Tenki Onozawa
Graduate School of Kansai University

Date submitted: 31 Jul 2019 Electronic form version 1.4