Abstract Submitted
for the DFD20 Meeting of
The American Physical Society

Lingering dynamics of microvascular blood flow in vivo[1] ALEXANDER KIHM, STEPHAN QUINT, Dept. of Experimental Physics, Saarland University, MATTHIAS LASCHKE, MICHAEL MENGER, Institute for Clinical and Experimental Surgery, Saarland University, THOMAS JOHN, LARS KAESTNER, CHRISTIAN WAGNER, Dept. of Experimental Physics, Saarland University — The microcirculation in animals and humans is directly linked to their health state. Any alterations in this blood flow may lead to pathological states, e.g. ischemia. Since typical vessel dimensions in the capillary bed are in the range of individual red blood cells, the particulate nature of blood is well pronounced. Indeed, red blood cells undergo a complex shape transition while flowing through bifurcating and merging vessels. While approaching a bifurcation apex, red blood cells can drastically reduce their velocity, and even rest at this apex. These so-called lingering events are well-known in the field of hemodynamics, however, no systematic studies concerning the effects on the subsequent bloodstream exist. We present an experimental study on living hamsters investigating the lingering events and consequences thereof. Therefore, we perform a joint method of particle tracking and integrated signal evaluation of flowing red blood cells. We show evidence that lingering events lead to a shift of median durations of cell-free areas. Further, lingering events can be linked to the redistribution of consecutive red blood cells in the bifurcating geometry as well as a spatial distancing of red blood cells.

[1]The authors acknowledge support from the research units DFG FOR 2688 - Wa1336/12, and DFG FOR 2688 - LA2682/9-1 of the German Research Foundation.

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Date submitted: 30 Jul 2020 Electronic form version 1.4