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Presentation Abstract

Session: Monday General Poster Session

Presentation: **BLOOD FLOW IN A BIFURCATION AND CONFLUENCE MICROCHANNEL: EFFECT OF THE CELL-FREE LAYER IN VELOCITY PROFILES**

Presentation Time: Monday, Jul 07, 2014, 11:00 AM - 9:30 PM

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Abstract: A few detailed studies have been performed in complex in vitro microvascular networks composed by bifurcations and confluences. The main purpose of the present work is to numerically simulate the flow of two distinct fluids through bifurcation and confluence geometries, i.e. red blood cells (RBCs) suspended in Dextran40 with about 14% of hematocrit and pure water. The simulations of pure water and RBCs flows were performed resorting to the commercial finite volume software package FLUENT.

A well known hemodynamic phenomenon, known as Fahraeus-Lindqvist effect [1, 2], observed in both in vivo and in vitro studies, results in the formation of a marginal cell-free layer (CFL) at regions adjacent to the wall [3]. Recently, studies have shown that the formation of the CFL is affected by the geometry of the microchannel and for the case of the confluences a CFL tend to appear in the middle of the microchannel after the apex of the confluence [4, 5]. By using the CFL experimental data, the main objective of this work is to implement a CFL in the numerical simulations in order to obtain a better understanding of the effect of this layer on the velocity profiles.

Key Words: Velocity profiles, cell-free layer.

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