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On the analysis of hemorheological data with mathematical models

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With the development of a modern experimental base, new data on the rheological, microrheological and micromechanical properties of blood and blood cells are obtained. The aim of the study is to review the existing constitutive dependencies for describing the rheological properties of blood, used as a basis for numerical simulations of blood flow in different parts of the vascular system. The purpose of the work is to clarify the interrelation between the complexes of hemorheological and micromechanical properties of blood – erythrocyte aggregation and deformability, mechanical properties of the blood cell membrane – elasticity, surface charge and others, through the analysis of prognostic hemorheological and mathematical models and numerical simulations. The analysis of the results of the simulations and their comparison with the experimental data will help to create new specific parametric models of the main characteristics of blood cells, their rheology and micromechanics – in normal conditions and in disorders of microcirculation and blood flow in various diseases, in particular in cerebrovascular, peripheral vascular diseases and in diabetes mellitus type 2 (T2DM).

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