

Abstract Submitted  
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**Red blood cell clusters in Poiseuille flow** GIOVANNI GHIGLIOTTI, University of British Columbia, Vancouver, Canada, HASSIB SELMI, Ecole Polytechnique de Tunisie - La Marsa, Tunisia, CHAOUQI MISBAH, Universite de Grenoble-CNRS - Grenoble, France, LASSAAD ELASMI, Ecole Polytechnique de Tunisie - La Marsa, Tunisia — We present 2D numerical simulations of sets of vesicles (closed bags of a lipid bilayer membrane) in a parabolic flow, a setup that mimics red blood cells (RBCs) in the microvasculature. Vesicles, submitted to sole hydrodynamical interactions, are found to form aggregates (clusters) of finite size. The existence of a maximal cluster size is pointed out and characterized as a function of the flow intensity and the swelling ratio of the vesicles. Moreover bigger clusters move at lower velocity, a fact that may prove of physiological interest. These results quantify previous observations of the inhomogeneous distribution of RBCs in vivo (Gaehtgens et al., Blood Cells 6 - 1980). An interpretation of the phenomenon is put forward based on the presence of boli (vortices) between vesicles. Both the results and the explanation can be transposed to the three-dimensional case.

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