Biological membranes and biofluids at the microscale

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Biological membranes are fundamental ingredients of cells. They are the boundaries which separates the intracellular components from the extracellular medium. In this course I will present theoretical and experimental results regarding physical properties of membranes and its relation with rheological properties of biofluids like blood. Mechanical properties of blood cell membranes, like the elasticity of the membrane, will be related to the elastic properties of the viscous blood flow. I will discuss rheological properties of biofluids at the microscale, such as the viscosity of blood in microfluidic devices. The effects of the walls of the device will be discussed. Different purposes of these studies are the design of lab-on-a-chip micro-devices for bio-medical analysis of diseases such sickle cell anemia, malaria and cancer.

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