Viscosity distinction for healthy and unhealthy blood using front microrheology

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The rheological properties of blood depend highly on the properties of its red blood cells, concentration and membrane elasticity. These properties affect the viscosity of blood, as well as, its shear thinning behavior and, in some cases, are related to diseases, such as typical anemia or alpha-thalassemia, which affect the features of red blood cells. By mean of the experimental analysis of the front advancement of blood in a microchannel, we determine the viscosity of different samples of blood. We present a method that successfully scales the viscosity of blood of healthy, anemic and alpha-thalassemic blood samples, according to the concentration of erythrocytes and the bending properties of its membrane.