

### Red blood cell deformation and shape recovery in the shear flow

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When the Red blood cell (RBC) experiences flows, it shows various behaviors individually such as deformation, tumbling, tank-treading, even rupture. In this study, we focused on the deformation in the steady-state shear flow and shape recovery as following a sudden flow stoppage to obtain the mechanical properties of RBCs. The cells were suspended in biopolymer solutions poly(vinyl) pyrrolidone (PVP) and the suspended solution was inputted into the two transparent plates, and the images were captured during flowing. The degree of deformation were measured and analyzed with the captured images. The time course of single RBC shape recovery could be described with exponential equation and modified. Calculated time constants for normal human RBC were  $0.175 \pm 0.0143$ sec and  $0.114 \pm 0.0282$  sec in PVP 6.8wt% medium as fitted by 2 parameters exponential decay equation and 3 parameters one.