transfusion. We also conducted a simple size distribution measurement in those samples to identify the RBCs coming from the blood transfusion. In addition, we have studied how those transfused RBCs in the overlapping region of the size distribution in the transfused SCA patient respond to direct laser trapping in comparison to RBCs from a normal HbA individual. The results show that the relative size change is higher for the RBCs in a normal individual than those in a transfused SCA patient. This is mainly because of the presence of more sickle hemoglobin than the normal hemoglobin in the blood sample. We have also studied how the cells from the two samples relax and recover their size and shape after they are released from a trap with different strengths by analyzing the relaxation rates of the cells. The relaxation rates for the RBCs from the healthy blood sample are relatively faster than those from the transfused SCA blood sample at a relatively low power. For both the healthy and transfused SCA, interestingly, the RBCs show that the cells released from a high power trap relax relatively faster than those released from a low power trap up to a certain limit. This is probably due to an increase in the fraction of the energy absorbed by the water molecules in RBCs in the infrared region at high intensity which could facilitate the relaxation of the cells though thermal vibration. Changes in deformability and relaxation-time of the RBCs by the techniques described in this study could be correlated to the efficacy of transfusion treatments in SCA.

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