**Fine Tuning Membrane Stiffness of Red blood Cells with Bovine Serum Albumin**

Rekha Selvan, Praveen Parthasarathi, Shruthi S Iyengar, Sharath Ananthamurthy, Sarbari Bhattacharya\*

Bangalore University, Department Of Physics, Bangalore, 560056,India \* e-mail address: sarbari.bhattacharya@gmail.com

Abstract: Using optical tweezers to measure mechanical properties of human red blood cells (RBCs), we report that Bovine Serum Albumin (BSA), commonly used in suspensions of RBCs to retain their biconcave shape and to prevent adhesion to glass slides, alters their mechanical properties. We find that the exact nature of the change depends sensitively on the concentration of BSA, with an elevation of membrane stiffness at concentrations of 0.7mg/ml and higher and an inability to retain biconcave shape in all RBCs at concentrations below 0.1mg/ml. RBCs that appear to have retained their biconcave shape in suspensions with BSA at concentrations below 0.1mg/ml show mechanical behavior similar to that of RBCs that have been restored from crenation, that is, a reduction in cell membrane stiffness as compared to normal RBCs. On the other hand, RBCs in suspensions with a BSA concentration of 0.5mg/ml show unaltered mechanical response compared to normal RBCs. We advise thereby that extreme caution be exercised when using BSA in an RBC suspension especially when their mechanical properties are being investigated at the low stress regime.