A DYNAMIC SPECTRIN-DIMER SELF ASSOCIATION REGULATES OF RED CELL MEMBRANE MECHANICAL STABILITY

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To obtain insights into dynamics of spectrin dimer-dimer interaction in intact red cell membrane, we measured mechanical stability of resealed ghosts following reconstitution with functional alpha- and beta-spectrin recombinant protein fragments that can associate with intact dimers. We have been able to document that incorporation of increasing concentrations of either the alpha- or beta-spectrin fragment resulted in a concentration dependent decrease in membrane mechanical stability. This decrease in mechanical stability was related directly to the extent of the spectrin fragments incorporated into the intact membrane associated spectrin skeleton. These data unequivocally demonstrate the spectrin dimer-dimer association in intact membranes is dynamically regulated and exogenously added spectrin fragments can incorporate into the reassembled network and modulate the mechanical properties of red cells.