

OVEREXPRESSION OF 4.1R DISTURBS MICROTUBULE ORGANIZATION

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Protein 4.1 (4.1R) is a major structural component of the membrane-skeleton of the red blood cell which, in nucleated cells, is also present in other intracellular sites. The functional role that 4.1R proteins are playing in nucleated cells is not fully understood yet. To explore it, we have transfected 4.1R cDNAs isolated from human T-cells or fragments of these 4.1R cDNAs in cultured epithelial cells and observed that 4.1R overexpression disturbed microtubule organization. By contrast, the actin cytoskeleton, centrosomal components such as pericentrin or α -tubulin and the Golgi marker p58 were unaltered in all these cells. Cells overexpressing 4.1R proteins presented microtubules which no longer radiated from a single perinuclear focus. The centrosome was not detectable unless those cells were simultaneously stained with specific antibodies directed to centrosomal proteins. The unfocused microtubules had a depolymerizing capacity similar to that of normal microtubules and were also able to initially repolymerize and nucleate from centrosomes, but they became disorganized soon thereafter. The carboxy-terminal region of 4.1R had the maximum capacity of interfering with microtubule organization. Our results indicate that protein 4.1R plays a role in the maintenance of microtubule network.