

The long-term goal of the Laboratory of Biology of Cytoskeleton is to explain in molecular terms the role of microtubules in cellular processes and to characterize proteins associated with microtubules and its organizing centers (MTOCs). The main attention of our research is focused on γ -tubulin and its role in microtubule nucleation. We have shown previously that besides its localization on centrosomes, γ -tubulin is found on cellular membranes (Macůrek et al., 2008), plant kinetochores (Dryková et al., 2003) and marginal bend of embryonal chicken erythrocytes (Linhartová et al., 2002). γ -Tubulin also interacts with protein tyrosine kinases, that can regulate microtubule nucleation (Sulimenko et al., 2006; Macůrek et al. 2008). There are growing evidence that centrosomal proteins can affect genetic stability of the cell. γ -Tubulin is involved in the regulation of the cell cycle (Vardy et al., 2002) and can participate in activation of checkpoint mechanism controlling the integrity of DNA. Recently, it has been proved its interaction with nuclear protein ATR (Zhang et al., 2007) and Rad51 (Lesca et al., 2005). That's why γ -tubulin has been connected with the process of cancerogenesis. Cancer cells also display the changes in expression of β -tubulin isotypes (Katsetos et al., 2003). Moreover, increased level of β III-tubulinu has been observed in tumors resistant to drugs (Ferlini et al., 2007). In this work, I try to elucidate some new functions of tubulins mainly in tumor cells.