## IV. CONCLUSIONS

Major results of this PhD thesis can be summarized as follows:

A complex distribution pattern of γ-tubulin was found in cells with highly specialized microtubule structures. γ-Tubulin was unexpectedly located on the marginal band of microtubules in differentiating avian erythrocytes. In protozoa *Leishmania* γ-tubulin was associated with the posterior pole of the cell and with the paraflagellar rod in the flagella. Moreover γ-tubulin was found in membrane microsomal fraction in plants and in detergent-resistant fractions in mammalian cells. These findings indicate that γ-tubulin might have in different cell types other functions besides microtubule nucleation.

We have demonstrated that γ-tubulin is able to form oligomers and to form complexes with αβ-tubulin dimers. γ-Tubulin is present in cytoplasmic complexes of various size and its binding properties change during differentiation events. Our data indicate that γ-tubulin is present in other molecular complexes apart from earlier described large (γ-TuRCs) and small (γ-TuSCs) complexes. We have demonstrated for the first time that in various cell types γ-tubulin is posttranslationally modified and that in mammalian cells it can be phosphorylated. We suggest that posttranslational modifications of γ-tubulin might regulate interactions of γ-tubulin with αβ-tubulin heterodimers or other associated proteins.

γ-Tubulin is associated with protein tyrosine kinases involved in signal transduction events. γ-Tubulin complexes with the active Src family kinases and other tyrosine-phosphorylated proteins were found in embryonal carcinoma cells as well as in mast cells. Activation of mast cells led to rapid polymerization of microtubules that was dependent on the activity of the Src family kinases. γ-Tubulin interacts with protein tyrosine kinases of the Src family through their regulatory SH2 domains and this interaction is phosphotyrosine type. Our data indicate that the association of γ-tubulin with SH2 domain is probably mediated via adaptor-like tyrosine-phosphorylated protein(s). We propose that Src family kinases are involved in the regulation of binding properties of γ-tubulin and/or microtubule nucleation.