Drug resistance in cancer cells is a frequent cause of breast cancer therapy failure. The aim of this thesis was to elucidate mechanisms of resistance to taxanes, that are used in therapy of various types of cancer, including breast cancer. We particularly assessed the role of autophagy and changes in βII- and βIII isotype gene expression in development of taxane resistance. As model of breast cancer we used human sensitive cell lines SK-BR-3, MCF-7 a T47-D and resistant sublines SK-BR-3-PAC/REZ a MCF-7-PAC/REZ which grow in paclitaxel concentration lethal for sensitive sublines.

In cell lines SK-BR-3 and MCF-7, taxane application decreased the level of autophagy, however in cell line T47-D led to its activation. We detected no difference between basal levels of autophagy in sensitive subline SK-BR-3 compared to resistant subline SK-BR-3-PAC/REZ, but we observed increased basal level of autophagy in sensitive subline MCF-7 compared to the resistant subline. Increase or decrease level of autophagy did not affect taxane resistance, except activation of autophagy in resistant subline SK-BR-3-PAC/REZ, that further increased the resistance to paclitaxel.

Taxane application in cell line T47-D increased the levels of βII- and βIII-tubuline expression, however we did not find any similar effect in other tested cell lines. We did not observed any differences in basal levels of βII-tubulin between sensitive and resistant sublines SK-BR-3 a SK-BR-3-PAC/REZ, however we found increased level of βIII-tubulin in resistant subline. In MCF-7cells, we detected increased basal level of βII-tubulin in resistant subline MCF-7-PAC/REZ, but the level of βIII-tubulin was higher in sensitive sublinie compared to resistant subline.

In conclusion, the level of autophagy participates in taxane resistance probably only in specific events. Changes in gene expression could be at least partially involved in taxane resistance of βII-tubulin in MCF-7 and T47-D cells and of βIII-tubulin in SK-BR-3 and T47-D cells.