

## *Abstract*

This thesis focuses on gynecopathology. It consists of a collection of seven papers published in pathology journals with impact factor. Introduction section contains selection of examples showing scientific application of molecular genetic methods. Further on the aims of individual research projects are described. The first project comprises histomorphologic study of skin endometriosis addressing „mullerian“ differentiation. A case report of a rare tumor namely borderline papillary serous tumor of the fimbriated end of the fallopian tube follows with molecular genetic analysis of KRAS, BRAF and p53 gene mutation status. Prospective longitudinal study on high grade squamous dysplasia (HSIL) of the cervix in HPV vaccinated women, so called DAV (dysplasia after vaccination), aims to elucidate pathogenesis of this phenomenon. Two other studies focus on incidence of fumarate hydratase deficient leiomyomas of the uterus and hereditary leiomyomatosis and renal cell carcinoma syndrome (HLRCC). The aim of those studies is to improve our diagnostic capability and increase detection rate of the patients with HLRCC syndrome. Finally a new subtype of HSIL namely bizarre cell dysplasia is described in two separate studies. Conclusion remarks contemplate the role of molecular genetics in surgical pathology.