The aim of this study was molecular characterization of four types of renal tumours (papillary renal cell carcinoma [PRCC], tubulocystic renal carcinoma [TCRC], pseudorossette forming renal carcinoma [PRRC] and unclassified renal carcinomas [URC]) and two types of rare tumours of the testes (Adult type of granulosa cell tumours [ATGCTs] and Incompletely differentiated sex cord stromal tumours [ISCSTs]).

In case of TCRC the activity of signalling pathways involved in angiogenesis was studied. The aim was to determine the suitability of antiangiogenic agents for treatment of TCRC. Next, the methylation profile of 24 tumor suppressor genes was studied in TCRC and PRCC in order to analyze their similarity. Eventual differences could be helpful tool in differential diagnostics. Also, spectrum of chromosomal aberrations was analyzed by array-CGH in one case of PRRC and two cases of URC. Any unique aberration found would be useful in differential diagnostics of these tumors. Last, but not least, the specificity of mutation c.402C>G of FOXL2 gene for ovarian ATGCTs was verified by studying its occurrence in testicular ATGCTs and ISCSTs.

Analysis of mRNA levels did not reveal any enhanced activity of the studied signalling pathways. Cluster analysis of methylation profiles showed close relationship between PRCC a TCRC. Array-CGH revealed unique (to date unknown) spectrums of aberrations in PRRC and URC. Mutation FOXL2 c.402C>G wasn´t found in our series of testicular ATGCTs and ISCSTs.