Abstract

The diploma thesis was focused on evidence of selected somatic mutations in genes *ALK* (Anaplastic lymphoma receptor tyrosine kinase), *BRAF* (v-Raf murine sarcoma viral oncogene homolog B1) and *β-catenin (CTNNB1)* through molecular - genetic methods in the target group of neuroectodermal tumors (neuroblastoma, medulloblastoma, brain tumors, paraganglioma and pheochromocytoma). Some of them are already considered as prognostic indicators which help to identify the subtype of various tumors and on the basis of this molecular - biological classification choosing the appropriate treatment. The genetic material of 133 patients was used for the analysis divided by the type of cancer. The presence of the mutation was detected in seven cases, of which two of them belonged to the gene *BRAF*, one to the gene *ALK* and four to the gene *β-catenin*. The subject of research in the cases of this genes were hotspot mutation sites. The purpose was to confirm the presence of the mutation in the hotspots and contribute to the studies which are aimed at the introduction of more suitable treatment through the inhibitors of mutated genes.

**Keywords**: *ALK, BRAF, β-catenin (CTNNB1)*, neuroectodermal tumors, sequencing, MLPA