

The incidence of cancer is increasing every year. According to the estimates of the World Health Organization (WHO), cancer is one of the leading causes of death. A tumor that has a high mortality rate is glioblastoma (GB), a malignant brain tumor. Despite an initial positive response to the drug, most patients develop resistance and no longer respond to treatment. The lack of sensitivity of tumor cells to drugs with different structures and mechanisms of action is called MDR – multidrug resistance. MDR is a multifactorial phenomenon and the underlying mechanisms are not fully understood. Epigenetic changes, including modulation of gene expression by small noncoding RNA molecules, called microRNAs, are considered as important modulators of MDR.

MiRNA-7-5p is a miRNA molecule, whose role in the emergence of drug resistance is currently studied. It has been observed that administration of miR-7-5p to cancer cells sensitizes these cells to subsequently applied drugs. However, the mechanism of this phenomenon is not fully understood.

The main aim of the project is to analyze the role of miR-7-5p in modulating multidrug resistance. We assumed that miR-7-5p alters the expression of genes associated with the development of drug resistance during treatment with chemotherapeutic agents. The study will be conducted on glioblastoma-derived cell lines. During the study, we will use advanced molecular biology techniques. We expect that the results will allow us to target genes, proteins and mechanisms involved in modulating drug resistance and sensitizing cells to chemotherapy. We expect to identify new potential therapeutic targets that will enable better therapeutic efficacy and increase the chances of relapse-free survival of patients.