Description for the general public

One of the main challenges in the cancer therapy is development of resistance to standard anticancer treatment. Searching of the new anticancer therapies is currently focused i.e. on the research on compounds, which can sensitize resistant cancer cells to standard treatment. The basis of many standard anticancer therapies is using of compounds, which directly introduce damage to the DNA of cancer cells. Many currently used anticancer compounds act via inducing the most serious type of DNA damage – the double strand breaks (DSB). DSB can cause genomic instability, and even can lead to cell death. That is why DSB-inducing compounds are widely used in cancer treatment. However, it was observed, that in cancer cells alterations resulting in an increase of efficiency of DNA repair can occur. Using of compounds which can inhibit the DNA repair is a promising way in the study on sensitization of cancer cells to standard treatment.

The aim of our study is an identification of the mechanism of action of DNA DSB inhibitors in human ovarian cancer cells. These compounds can be utilized in standard therapy, and it will increase the sensitivity of cancer cells to anticancer compounds.

Accomplishment of this project will be connected with the investigation of the mechanism of action of DSB inhibitors on human ovarian cancer cells exposed to cisplatin and etoposide – commonly used anticancer compounds. In our study we plan to use a set of endometrioid and serous ovarian cancer cell lines with different sensitivity to standard anticancer drugs. We plan to investigate the mechanism of sensitization of human ovarian cancer cells to cisplatin and etoposide, because combined treatment with these drugs is often used in the treatment of advanced, cisplatin-resistant endometrioid and serous ovarian cancers. Research planned in this project will contribute to the development of knowledge concerning new possibilities of sensitization of cancer cells to standard therapy.