DESCRIPTION FOR THE GENERAL PUBLIC

Recent research indicates the important role of the microenvironment surrounding tumor cells for tumor growth, resistance to control mechanisms and metastasis. Cancer cells, through the mechanism of release active molecules outside the cells, are able to control their own functioning. One of the compounds released by a tumor cells is adenosine triphosphate (ATP). It has been found that there is a large difference in the concentration of ATP and its degradation products in the extracellular environment of the tumor tissue relative to normal tissue. These differences are observed both *in vitro* and *in vivo*. Numerous studies have shown that releasing large amounts of ATP into the extracellular space by tumor cells is a deliberate effort to increase metastatic support parameters, including the induction of epithelial-mesenchymal transition. However, the mechanism of this phenomenon is unknown.

Furthermore, it is known that ATP in the extracellular environment undergoes rapid hydrolysis and therefore it is difficult to assess whether the observed effect is caused by the activity of the adenosine triphosphate itself or its degradation products. To answer this question, the project will provide a chemical synthesis of hydrolytically stabile modified. Both, analogs of ATP and ATP intermediates (ADP and AMP) will be prepared and thus it will be possible to observe the biological effects of each of these compounds. This approach will be helpful for better understand this specific mechanism of self-regulation.

Creating a new cancer foci is a huge therapeutic problem. Knowing the mechanisms responsible for breaking apart from neighboring cells, migrating to another destination, and creating a new neoplasm is extremely important for trying to control this process. Due to the fact, that the epithelial-mesenchymal transformation itself, which is accompanied by the metastatic phenomenon, is still underdeveloped, improving this knowledge seems to be crucial. Despite many years of extensive research, it is still an unexplored issue. The results of this project will help to better understand this process and to plan future therapeutic procedures.