Description for the general public

Clear cell renal cell carcinoma (ccRCC) is the most common type among renal cancers, resistant to targeted therapies. There are no symptoms in the early stages, thus at the time of diagnosis, metastasis is found in over 30% of patients. In this case, survival chances of patients drastically decreased. Currently, the primary method of ccRCC treatment is partial or total nephrectomy, combined with radio- or chemo-therapy, which usually have low efficacy. At advanced stage, or in case of metastasis, therapy is based on targeted drugs, which mainly blocked development of tumor vasculature. This form of treatment is not satisfactory, as it prolongs the patient's survival time by only a few months. Our preliminary studies have shown that the level of tumor angiogenic factors in patients tumor tissue samples, is elevated in early stages, suggesting that angiogenesis inhibitors should be used immediately after the onset of the disease. Moreover, these drugs potently activate c-Met receptor, important oncogene, which stimulates metastasis and survival of tumor cells. Knowing the mechanisms responsible for the development of ccRCC is necessary to find better approach of clear cell renal cell carcinoma therapy.

MCPIP1 protein is involved in regulation of inflammatory response, maintaining cell homeostasis and significantly influence cancerogenesis. Recent reports, and our preliminary results suggests, that MCPIP1 level is lower in patient tumor tissue samples compared to surrounding healthy tissue, and further decreases with cancer development. In the proposed project we would like to expand this knowledge, about the properties of MCPIP1 as potent tumor inhibitor, on tumor initiation, metastasis and resistance of targeted drugs in clear cell renal cell carcinoma. In our study we will use both cancer cell lines and normal kidney cells, as well as various animal models. We will examine the effects of targeted drugs in combination with compound, which currently is in clinical phase and MCPIP1 on tumor cells. In addition, we collected biological material from patients diagnosed with clear cell renal cell carcinoma with clinical data describing received treatment. Tissues will be analyzed for the presence of metastatic and tumor recurrent factors and next, correlated with used treatment.

Proposed research will help in understanding the biology of kidney cancers, the role of MCPIP1 during cancer progression, and may contribute to the creation of new effective forms of treatment of clear cell renal cell carcinoma or improving existing ones.