The actin-myosin cytoskeleton has many important functions in the cell. It is responsible for maintaining the correct structure of tissues, the shape and division of cells, as well as cell movement. In the majority of cancers, cell movement is critical in the process of metastasis. For this reason, targeting the mechanisms and proteins involved in this process has become the focus of anti-cancer therapies. MRCKα and MRCKβ kinases are proteins that regulate the formation and activity of the actin-myosin cytoskeleton. Their role in the process of metastasis was confirmed in many types of cancers, among others in colorectal cancer and squamous cell carcinoma. It has been shown that the introduction of selective inhibitors of these kinases reduced the motility of cancer cells. These observations suggest that the use of these inhibitors may have therapeutic benefits. Studying the role of MRCK in cellular communication, we found that MRCKα and MRCKβ can act together as a protein complex, so-called heterodimer. However, it has yet to be determined what function MRCKα and MRCKβ heteromultimeryzation plays in the phenomena regulated by these kinases.

The results obtained during the project will help fill this gap and answer the question of whether MRCKα and MRCKβ kinase heteromultimeryzation is crucial in the process of cytoskeleton reorganization and tumor cell migration, as well as cellular communication. Our work may contribute to the discovery of new therapeutic solutions in the treatment of cancer and birth defects.