

Technological progress and the environmental changes caused by it contribute to an increase in the incidence of many diseases. The loss of 1% of the ozone layer is estimated to be associated with an approximately 2% increase in melanoma mortality. Melanoma is a malignant tumor that develops from the pigment-producing cells known as melanocytes. Interestingly, these tumors affect not only humans, but also accompanying animals, including dogs. Despite huge progress in research on the biology of this cancer and the implementation of many innovative treatments (including immunotherapy), melanoma is still a big challenge for today's oncology. Late diagnosis of the disease, and especially the occurrence of metastases, significantly shortens patients' survival time.

The aim of the proposed project is to investigate the influence of proteins secreted by a specific subpopulation of immune system cells, Th17 lymphocytes, on the ability of canine melanoma cells to metastasize. Preclinical studies have shown that the Th17 lymphocytes effectively eradicated melanoma cells in the mouse model, which gave great hope for developing a new method of the cancer treatment. However, the current state of scientific knowledge does not allow to define precisely the role of the Th17 lymphocytes in melanoma development. According to the latest findings, proteins secreted by the Th17 cells, especially interleukin-17 (IL-17), can support tumor development by increasing the ability of cancer cells to metastasize. On the other hand, they have immunomodulatory properties and may increase the anticancer response. At the same time, the role of other cytokines (IL-21, IL-22) secreted by the Th17 lymphocytes in melanoma progression is unknown.

In the project we will examine the influence of the Th17 lymphocyte-secreted factors on the viability of melanoma cells, their migratory capacity and induction of new blood vessel growth. In addition, molecular analysis of changes occurring in melanoma cells, resulting in the acquisition of an invasive phenotype by the epithelial-mesenchymal transition, will be performed.

The study will be conducted in companion dog model, which is an attractive model for research on the pathogenesis of many diseases. Dogs, as a companion animals, share a common environment with humans and are exposed to the same pathogens. Cancers in dogs occur spontaneously with age, and they are treated with similar forms of therapy to humans.

Therefore, the results obtained in the project will contribute not only to the development of new treatments in veterinary medicine, but will also provide a valuable contribution to the understanding of melanoma biology and will be useful in comparative medicine.