

## **Abstract**

Beside tumor cells themselves, tumors consist of many non-malignantly transformed cellular elements and an extracellular matrix. This so-called tumor microenvironment, or stroma, significantly influences the biological properties of the tumor through intercellular interactions. In this thesis I have focused on the study of tumor-associated fibroblasts in squamous cell carcinomas of the head and neck, malignant melanoma and glioblastoma.

The data show the presence of cells with mesenchymal characteristics, present even in the glioblastoma stroma, which could potentially have a positive effect on proliferative activity and invasiveness of glioblastoma cells.

In malignant melanoma, the presence of keratinocytes should also be considered, as they are the major cells of the epidermis influencing tumor melanocytes. The conditioned medium from UVB irradiated keratinocytes and non-irradiated fibroblasts stimulates the invasion of malignant melanoma cells.

Targeting the tumor stroma may be a new direction in oncological therapy, so we have focused on the influence of synthetic polyamine on the formation of myofibroblasts, which are an active part of the population of tumor-associated fibroblasts. The tested polyamine prevents the formation of myofibroblasts but has no effect on those already formed nor on smooth muscle cells.

We have also attempted to further characterize the squamous cell carcinoma of the head and neck. Samples of the tumor, its surrounding tissue and contralateral healthy mucosa were subjected to RNA analysis and to immunohistochemical examination with particular emphasis on present galectins, keratins, fibronectin and tenascin-C.

There was no statistically significant relation between the presence of galectin-1, fibronectin or tenascin-C within the extracellular matrix and the prognosis of the patients in our dataset.

**Key words:** tumor stroma, intercellular interactions, tumor-associated fibroblasts, extracellular matrix, polyamines, squamous cell carcinomas of the head and neck, malignant melanoma, glioblastoma