Cutaneous melanoma is a malignant tumor with high mortality, due to high capability of invasion, rapid metastasis and resistance to traditional chemotherapies and radiotherapies. The opportunity for the patient is the early detection of the disease and the prompt initiation of appropriate treatment. So far not identified biomarkers with the necessary specificity and sensitivity for the early detection and monitoring progress for melanoma. Therefore, melanoma remains cancer for which it is necessary to search for diagnostic and prognostic markers as well as new therapeutic targets.

Changes in the profile of protein glycosylation are a hallmark of cancer cells and affect the growth and survival of those cells, as well as contribute to their acquisition of the ability to migrate and invade. The unique set of cell surface glycoantigens on cancer cells can be a valuable marker to identify them, determine the stage of the disease as well as be a target of anti-cancer therapy. In recent studies, we found that melanoma cells have a higher amount of N-oligosaccharides containing β1-3-linked galactose (Galβ1–3GlcNAc epitope, LacNAc type I) in comparison to melanocytes. We also found an increased expression of the *B3GALT1* gene, which is responsible for the synthesis of this epitope in metastatic melanoma cells. It is interesting and still unexplored, which melanoma cell proteins possess Galβ1-3GlcNAc epitope and what function this epitope plays in cell bahaviour.

The aim of the project is to: 1) identify proteins and mapping of sites bearing Galβ1–3GlcNAc epitope in melanoma cells as well as in melanocytes, 2) investigate the impact of the Galβ1–3GlcNAc epitope on the migratory and invasive behavior of cells and on their ability to proliferate.

The study will be performed on three human cell lines: HEMa-LP (melanocytes), WM793 (primary skin melanoma) and WM266-4 (metastatic skin melanoma). Glycoproteins with LacNAc type I epitope will be isolated from cell lines by immunoprecipitation with the antibody recognizing the tested structure. Next, glycoproteins containing LacNAc type I epitope will be identified by mass spectrometry. In order to investigate the role of Galβ1–3GlcNAc epitope, *B3GALT1* gene will be silenced in melanoma cells, and then functional studies (Wound healing assay, Matrigel invasion assay, AlamarBlue viability assay) will be conducted.

The discovery of melanoma-specific proteins containing the Galβ1-3GlcNAc epitope will allow for their further testing for their usefulness in a clinical diagnostic test for skin melanoma. Furthermore, understanding the role of the LacNAc type I epitope in cells proliferation, migratory and invasive properties is important for the development of strategies in the treatment of cutaneous melanoma.