

Endometrial cancer (EC) is one of the most common cancer types among women. According to the International Agency of Cancer Research, the incidence of EC will increase by 50% in the year 2040. In Poland statistics indicate 7.7% of the EC incidence among all cancer patients, and 3.5% of the EC patients die from the disease. Among risk factors favoring EC development, menopausal status, obesity, diabetes, hypertension, unopposed estrogen have been mentioned, however, much less is known about the factors that can directly induce the formation of tumors. Potentially, changes within microbiome content could be the main risk of cancer development. Some of the mechanisms by which microbes may contribute to cancer are alteration of the balance of human cell proliferation and death, influence on the host's immunological status, and interference with the host metabolism regulation. However, these factors have not been fully investigated, from the perspective of endometrial cancer development. Recent findings are highlighting the differences between the uterine microbiome of healthy women and those undergoing the pathological states. A potential risk factor, which increases the development of this tumor type, can be a misbalance of endometrial and vaginal microflora. In this case, the reason could be the presence of specific species of pathogenic microbes, which were identified in many gynecological diseases. Overgrowth of these species is usually caused by *Lactobacillus* spp. reduction, whose major role is to provide a proper uterus environment. These microbes are dominant in the gynecological tracts of healthy women. Microbial misbalance may be responsible for the cancer development continuum due to microbes and cancer cell interactions. Because of that, our major research task is not only to examine the microbial content of normal and cancerous tissues and cervical canal swabs from the Polish women population but also to understand the microbial - endometrial cells interactions. The final study step will be performed by examination of chosen NSAIDs and anticancer drugs' activity against cancerous cells in the presence of identified pro-tumorigenic Ecbiome species. Project realization will be divided into several research stages, which major tasks will evaluate:

- Microbial cohorts' identification in the studied human tissues and corresponding cervical canal swabs;
- Evaluation of selected microbes on human cancerous and non-cancerous cells;
- Assessment of chosen drugs' activity against cancerous and non-cancerous cells in the presence of identified pro-tumorigenic ECbiome.

The obtained results from this project will deepen the current knowledge on microbial and human cell interaction and the impact of specific microbial strains on endometrial cancer development. Moreover, the project results should significantly improve the understanding of endometrial microflora contribution to uterus function. The proposed project plan will shed new light on the interaction between selected microbial species and human cells, which will have a positive influence on the discipline development.