Cells, whether eukaryotic or prokaryotic, release very often membrane vesicles filled with different types of molecules, for example proteins, DNA or RNA, in order to communicate with other cells, answer to changes in their environment or to obtain nutrients. Of particular interest to scientists are EVs (Extracellular Vesicles), released by the cancer cells and pathogenic microorganisms. It is justified as research in this area might help in the development of new anticancer and antimicrobial therapies or diagnostic tools. However, we should not forget that human body is also constantly exposed to contact with non-pathogenic microorganisms, especially those which we consume daily with our food. Therefore, it is worth knowing whether those microorganisms interact with human cells and whether EVs are engaged in them.

Fermented food is rich in microorganisms that have a positive effect on the functioning of our body by: stabilization of the autochthonous microbiome and protection against colonization by pathogens, secretion of enzymes that support the digestion of food as well as substances that stimulate the host's immune system. Among microorganisms that we consume on a daily basis are not only lactic bacteria, but also yeast, for instance of the genus *Saccharomyces* and *Kluyveromyces*. So far, the best documented probiotic efficacy in clinical trials has been demonstrated by two strains of microscopic fungi- *Saccharomyces boulardii* CNCM I-745 and *Kluyveromyces marxianus* B0399. These fungi present some probiotic functions, e.g. antagonistic activity against pathogenic microorganisms or high survival rate in the digestive system and have a safe status (GRAS). It brings up a question of whether this probiotic activity of microorganisms is connected to EVs released by them.

Our research hypothesis is that yeasts that we consume with fermented food or probiotics after entering digestive tract release extracellular vesicles, filled with different molecules, mainly proteins and nucleic acids, which later on interact witch epithelial cells of the intestine. As a part of proposed project we plan on verifying our hypothesis by studying yeast *S. boulardii*, *K. marxianus* and *S. cerevisiae* in terms of production, morphology and composition of EVs in different breeding conditions, both standard ones as well as those imitating the environment in individual sections of the digestive track (stomach, small intestine and large intestine). This way we will find out, whether yeasts can produce EVs in the digestive track. Furthermore, our aim will be to check, whether yeast's extracellular vesicles show any effect on metabolic activity of human cells *in vitro* and whether they have a potential to transport their loads (e.g. proteins or RNAs) into human cells.

Implementing our project we will not only broaden the knowledge about yeast's EVs consumed trough food and probiotics, but we will also open the doors to new research areas, in which it will be possible in the future to attempt to create, for example modified yeast secreting antigens or therapeutic proteins in EVs. Perhaps this yeast or just vesicles produced by them will be used as medicinal products administered orally.