

Bacteriophages (phages) are viruses that infect bacterial cells. Bacteriophages are the most numerous biological entities in the biosphere – the total number of phage particles is estimated at 10^{31} . The presence of bacteriophages was also found in different food products and water. Interestingly, phages also constitute an abundant component of the gut microbiota of humans and different animal species, and their number in the gut is comparable to that of bacterial cells. It is known that bacteria from the microflora are absolutely essential for proper development and function of the gut immune system. An important part of this system are intestinal epithelial cells which perform a number of immune functions. Many studies showed that bacteria from the microflora interact with epithelial cells in the gut; these interactions are essential for homeostasis of the gut immune system. On the other hand, it is not known whether bacteriophages from the gut microbiota can affect function of intestinal epithelial cells. Therefore the main objective of this project is to investigate whether bacteriophages can influence immune functions of epithelial cells. The project will provide novel insights into the role of the microbiota in maintaining immune homeostasis in the gut mucosa and will verify whether phages could contribute to the development of inflammatory bowel disease and food allergy.