The aim of the project is to analyze the influence of a rotating magnetic field (RMF) on the activity of lytic bacteriophages, and the process of their propagation with the use of hosts (it is planned to use bacterial strains: *Escherichia coli*, *Pseudomonas aeruginosa*, *Staphylococcus aureus*). In addition, the project will evaluate the impact of RMF on the ability of bacteriophages to destroy bacterial biofilms and the effectiveness of phage therapy on an *in vivo* model (as the model organism greater wax moth (*Galleria mellonella*) will be applied). Research will also include the influence of RMF on the stationary phase phage infection efficiency and the impact of this type of interactions on the correctness of the structure of produced progeny virions as well as the expression of early and late phage genes.

The review of the literature shows that for the production of bacteriophages, methods characterized by insufficient efficiency, and using bioreactors equipped with turbine mixers, are used. There is no description of methods to intensify bacteriophage infection and propagation processes and proposals for innovative ways to intensify these processes. In addition, it was noted that in the literature of the subject there is a lack of studies thematically related to the influence of various types of force fields on processes associated with phage infection. It should be noted that this is a significant bioengineering restriction.

Bacteriophages are an alternative method of therapy of infections caused by multi-drug resistant bacterial strains; they are used to protect food against the development of unwanted microflora (in particular pathogenic) and are a valuable source of recognition elements in biosensors. In addition, they are used in veterinary medicine, plant protection, the environment and as ingredients of probiotic preparations. These factors determine the ever-increasing demand for the development of modern methods of supporting the production of bacteriophages using external factors that affect the activity of virulent bacteriophages. These issues are among the main issues in the field of basic sciences, requiring the use of interdisciplinary methods derived from bioreactor engineering, microbiology, virology and molecular biology.

The project puts forward a research hypothesis that RMF may accelerate the intracellular cycle of bacteriophage development and increase their ability to migrate in the medium (through intensification of Brownian motion), which can directly affect the ability of adsorbing virions to hosts and increase the efficiency of biofilms destruction and the effectiveness of phage therapy.

The expected outcome of the project assumes that the obtained results will provide important information on the yet undescribed process of the formation of bacteriophage infections under the influence of RMF. The implementation of the basic objectives of the project will be carried out using classical methods used in experimental research on bacteriophage infection processes enabling verification of the assumed goals. Experimental research will allow the description of the impact of RMF on bacteriolytic activity, which knowledge in the area of basic sciences regarding the influence of force fields on living organisms, bacteriophage biology and bioengineering will be deepened by a qualitative and quantitative description of the influence of RMF on the bacteriophage activity aspect. The results of the research will provide important information on the use of RMF in the phage production process, modulate their lytic and anti-biofilm activity and support phage therapy. The need to learn about the impact of RMF on these processes is related to the information gap in terms of the topics proposed in the project.