The presence of polyphenols, including flavonoids as natural components of cyanobacterial cells, indicates the ability of mentioned microorganisms to biosynthesis of this substances and thereby the existence of biochemical pathways that enable for their transformation. That is why blue green algae seem to be specially predestined for use them as effective biocatalysts modifying molecular structures of flavonoids, giving the beneficial properties of the biotransformation products. Biotransformations carried out by whole cells of cyanobacteria are still poorly understood, especially due to unknown mechanisms(s) of metabolic adaptations of these microorganisms, therefore, the initiation the study on their interactions with chalcones seems to be a reasonable plan.

Therefore, the purpose of this project is to define the ability of cyanobacteria – diverse morphologically and metabolically, autotrophic bacteria carrying out photosynthesis, to biotransformation of chalcones, one of the group of flavonoids, and to determine the main directions of these transformations.

Moreover, a wide range of environmental tolerance of cyanobacteria creates a rational premises to select conditions of biocatalytic transformations of chalcones, that enable targeted biotransformations of these compounds. Additional aspect of this research is identification of naturally produced polyphenolic compounds, including flavonoids by chosen blue green algae, and indication the compounds, which effectively inhibit the development of cyanobacterial colonies. This aspect is of special importance due to cyanobacterial blooms that can lead to the deterioration of aquatic ecosystems, simultaneously affecting human beings, because of the production of cyanobacterial toxins.