

## DESCRIPTION FOR THE GENERAL PUBLIC

Microorganisms colonize every possible environmental niche, what is dependent upon many physicochemical factors determining also the form of their existence. In fact, microbial cells may be in the form of individual, i.e. planktonic cells or live in the form of a complex structure called biofilms. In comparison to planktonic cells less research attention is focused on understanding the functioning of biofilms. Medicine is among exceptions, where an extensive research is conducted in the context of colonization of surgical implants and hospital infections. What is missing is research on biofilms of undesirable bacteria in the food chain, especially when it comes to biofilms formed by different species of microorganisms. *Listeria* cells, to which the project concerns, are unexplored in the context of the formation of and occurrence in the biofilm, thus considering their prevalence in the environment, this direction of study becomes worth undertaking. To date few studies have been carried out concerning the biofilm formation of *Listeria* spp. - e.g. it was demonstrated that *Listeria* can coexist with other species within biofilms. However, little is known of the relationships between cells of different species of bacteria in biofilms. It is not clear whether cells of different species start interacting with each other and form a biofilm structure together, or one of the biofilm member develops biofilm architecture to which the cells of other species attach and coexist. Next poorly understood aspect is the resistance to stress of *Listeria*—whether it changes depending on the species with which it forms the multi-species biofilm. The research proposed in the project, therefore, will help to get a new, missing knowledge of multi-species biofilms, the relationship between microbial cells in the biofilm and stress response of *Listeria* cells. Understanding biofilms where in *Listeria* is present will help to explain mechanisms underlying the functioning of cells in a biofilm and whether it has consequences for the food chain. This research is also necessary to improve the effectiveness of the methods of combating biofilm, inhibiting the formation process and preventing of this phenomenon.