Maintaining good health requires a well-functioning gastrointestinal (GI) tract, in both physically active and having a sedentary lifestyle people. This seems to be particularly important, especially in light of the common GI disorders often found in people around the world. Such disorders are more prevalent in societies living a Western lifestyle, as they are largely influenced by poor eating habits and psychological stress. Although recreational physical activity can be beneficial to health, research strongly suggests that people under high psychophysical stress, especially during periods of intense training at training camps or competitions, are more prone to negative GI symptoms that impair athletic performance.

It is therefore necessary to develop effective procedures to reduce the risk of GI problems, in which targeted nutritional support undoubtedly plays a key role. Among the broad-spectrum natural remedies that may have particular potential to support the GI tract and, in addition, the immune system, are probiotics (PRO) - widely regarded as health-promoting microorganisms that, when administered in adequate amounts, provide health benefits to the body and can increase the number of beneficial bacteria in the gut, so they have been linked to a range of potential benefits for gut health and immune function. However, it should be noted that the mechanisms of action and the actual effects of PRO on the body of an active person, especially during periods of intense training, have not been fully elucidated. The effectiveness of PRO may also depend on the bacterial strain used. Additionally, a paucity of reliably conducted scientific studies aimed at testing the effects of PRO supplementation on the body of psychophysically overloaded trained women has been identified. In the present project, it was hypothesised that an innovative protocol of a planned supplementation strategy, characterised by the specific: composition of the MPRO preparation (combination of several strains with proven activity), form of administration (delayed "release" capsules), duration of supplementation (2 weeks) and dose (scientifically proven amount of min. $2x10^9$ CFU per day), implemented in highly trained female rowers during the controlled conditions of an intensive national team training camp would have a significant beneficial effect on the health of the digestive system.

Therefore, the main objective of the project is to comprehensively evaluate the effect of MPRO supplementation on the occurrence of GI symptoms and disturbances in a vulnerable group. The present project will evaluate the effect of the MPRO supplementation strategy indicated above on changes of the concentration of highly specific indicators of GI integrity, immune response, gut microbiota composition and GI symptoms occurrence and psychological stress and physiological-metabolic response.

The results from this project will provide a multifaceted explanation of whether and how innovative MPRO supplementation affects the GI tract and reduces the risk of GI symptoms and improves physical performance. The research planned in the project is essential in the context of scientific and practical understanding of the actual impact of MPRO. This is particularly important because MPRO supplementation can in many cases contribute to improving the function of the GI and immune systems, the nutritional status of the body, the treatment of many diseases, supporting people working in particularly difficult conditions, and increasing the efficiency of the training process of athletes. An undeniable advantage of the project is also the fact that the conclusions formulated on the basis of the project can be used practically for applications not only for active and physically stressed people, but also for the general population. This interdisciplinary project is therefore of great importance in expanding basic scientific knowledge and in numerous practical aspects related to health and quality of life.