Romans used to say „A sound mind in a sound body”. This saying is still up to date as many of us appreciates beneficial effects of physical activity. Today, this is not just a simple observation because recent studies of health psychology have proved this effect experimentally: even after one session of moderate-intensity physical exercises we fell more relaxed, energetic and less susceptible to stress.

Despite many theories that try to explain this effect, the exact mechanism of improved mood after physical activity still remains unclear. Thus, our aim is to explore this effect at very basic level – at the level of brain activity. More specifically, we plan to verify how a single session of moderate-intensity physical exercise impacts three main levels of emotional stimuli processing: perception, attention and evaluation.

We will carry out three experiments that combine physical exercise session with subsequent emotional processing tasks. Exercising will be a cycling on stationary bike for 30-minutes at moderate intensity. Control task will be just sitting on the bike without pedaling. During the emotional processing task, the brain activity will be measured by means of the electroencephalography (EEG) recordings. The innovative method of EEG effective connectivity will allow us for inferring on causality of influences between brain structures involved in perception, attention and evaluation of emotional stimuli. Such network approach gives up studying individual brain structures without wider, network context. Thus, our project is consistent with this new approach and we hope it will lead to deep understanding of the impact that the one physical activity session has on the emotional functioning.

Results of our project will answer the question if the changes in emotional stimuli processing can serve as a mechanism of improved mood after physical exercise. This would have not only substantial meaning in the development of the research field but also will enable to understand why a single exercise session has the potential to be systematically used in everyday life to promote well-being. Recognizing this mechanism will help to understand why a lot of successful people start the day with the physical activity rather than with a cup of coffee and why it helps them to deal with everyday life challenges more efficiently. On the other hand, this basic knowledge may facilitate training strategies and sport programs intended for those who suffers from poor emotional life.