Depression is one of the major diseases of civilization leading to both physical and mental disability. According to a recent World Health Organization report, more than 322 million people worldwide suffer from depression. Despite 70 years of work on developing antidepressant drugs, about 30% of patients are treatment resistant. Nowadays, more and more attention is being paid to preventive or supportive measures for the treatment of depression, unrelated to the use of drugs such as, for example, introducing lifestyle changes or incorporating specific nutrients into the diet.

Edible mushrooms are a valuable resource used for thousands of years in traditional medicinal systems. The presence of edible mushrooms in life and the connection between them and their positive effects on human health has already been observed in the case of the so-called Ice Man (Ötzi), whose frozen body was found in an Alpine glacier. Two species of mushrooms were found next to his body, which today, with the help of available scientific tools and methods, are considered so-called medicinal mushrooms. To date, it has been proven that the systematic consumption of edible mushrooms contributes, among other things, to lowering the level of, so-called, "bad" cholesterol. Mushrooms are also a good source of protein, including amino acids, which the human body cannot produce on its own - that is why they are traditionally called the so-called "meat of the forests", which indicates their role as a substitute for red meat in vegetarian or vegan diets.

The effect of systematic consumption of edible mushrooms on depressive symptoms was first studied by American researchers at Penn State University, who indicated that people who eat them are at lower risk of depression compared to those who do not eat them at all. The results of this study have set the stage for many studies on the potential antidepressant activity of edible mushrooms and the mechanisms responsible for this activity.

The aim of the project is to evaluate the antidepressant activity of mycelium, obtained under laboratory conditions, of selected species of edible mushrooms – Pink Oyster mushroom (*Pleurotus djamor*), Shiitake mushroom (*Lentinula edodes*) and Lion’s Mane (*Hericium erinaceus*) due to preliminary reports of potential positive effects on the human nervous system. In addition, the project will test whether zinc-enriched mycelium has a stronger antidepressant effect than non-enriched one. As part of the project, a method will be developed to obtain mycelium of the above-mentioned species, whose so-called biomass will be characterized by the best parameters, e.g. content of substances with health-promoting effects. Research on beneficial effects on the central nervous system will be carried out on experimental cell lines and in an animal model of depression. In addition, tests will be performed on the content of chemical substances responsible for potential antidepressant effects.

Based on the research results, an answer will be provided to the question of whether mycelium, both enriched and non-enriched with zinc, can be an addition to the daily diet with potential effects in the prevention and treatment of depression.