

Depression is a major and growing health problem in Poland and worldwide. It also affects children and adolescents, with more and more patients requiring treatment with medication. In addition to implementing preventive programs to support the public's mental health, it is necessary to develop the tools for modern and effective pharmacotherapy. This health challenge motivates researchers, specialists, and clinicians from various fields to work together, in multidisciplinary research teams, to improve the situation and restore patients' ability to function healthily and satisfactorily in society.

We increasingly understand more about the mechanisms of depression. We know that the background of the disease varies significantly from individual to individual, which means that personalized and tailored selection of the appropriate drug, at the proper dose, will be needed to ensure safe and effective treatment. We are now talking about the so-called predictive biomarkers of depression, which are a specific image at the biochemical level of what is happening in the body of a depressed person. What's more, their levels can be determined in a blood sample. On this basis, and knowing the relationship between the level of biomarkers, the symptoms of depression, and the blood concentration of the drug used in a given patient, we can propose the most effective and safest pharmacotherapy.

Our project is intended to provide the scientific basis for such personalized therapy with the three most currently recommended drugs in children, adolescents, and adults, i.e., fluoxetine, sertraline, and escitalopram. We will compare the drugs in terms of their rapidity and potency, using advanced population analysis methods of the drugs' pharmacological properties. We will establish the factors determining the varying response to medication in different groups of patients. We will also compare drugs regarding side effects and identify optimal doses and therapeutic concentration ranges.

Ultimately, this will facilitate decision-making processes in the pharmacotherapy of depression and ensure a faster and more effective therapeutic outcome with optimal drug tolerance. We expect that our work will also contribute to further knowledge of the molecular basis of depression, which will serve not only as a basis for the search for new drugs, but also for proposing methods of prevention of this disease and non-pharmacological treatment.

Importantly, patients included in the study will also be direct recipients of the project's benefits. We will determine the best therapeutic solutions and perform research to help understand each patient's specific disease background. We will use modern research tools to minimize blood sampling and ensure that psychiatrists, psychologists, and pharmacists are well cared for during the study.