Depressive disorders constitute a growing problem affecting residents of developed countries all around the world. The development of medicine in the past decades and the raise in patients' awareness contribute to the prolongation of life. Unfortunately, these changes favor the generation of several CNS disorders. It is estimated that the number of people suffering from depression occurs at present to be around 120 million. In light of the above data, depression is commonly referred to as the 21st century epidemic (WHO data).

One of the key requirements of modern research is thus connected with the trials on the increase in the effectiveness of existing and developing new therapeutic strategies for diseases of the CNS – also those, which end up causing depression. The medicines present on the market are subject to a number of side effects, which include an important inconvenience - weight gain. This fact limits the use of most commercially available medicinal preparations. Furthermore, the current patients' requirements cover the need of drugs' selectivity increase to diminish the side effects evoked by the activity towards different body systems.

A natural library of different organic compounds – plant secondary metabolites constitutes an inspiration in the process of new drugs acquisition.

The herein described experiments fit into the search for new substances of plant origin that may be used in the future use in the treatment of neuropsychiatric disorders, including depression.
The search will be performed by a novel platform developed in the project from the modern analytical methods, which will enable a fast screening of plant extracts for their antidepressant activity.

The presence of this kind of tool is vital, as it will enable fast tracking of active metabolites with no need of their prior purification, which is time-, money- and solvents-consuming.
This new approach will enable the screening of not only different chemical compounds, but also of different plant species and their extracts.

For the realization of the project, the plants from Zingiberaceae family have been chosen. Turmeric and ginger have been used in Hindu, Chinese and Japanese medicine since ages as anti-inflammatory, immunostimulant, antibacterial, anti-atherosclerotic, and anti-migraine compounds. **Numerous scientific studies have confirmed the ability of extracts of turmeric and ginger to cross the blood-brain barrier and to induce pharmacological effects in the Central Nervous System (CNS**). In addition, these plants are edible plants, characterized by low toxicity.

Now, after certain points of the CNS functions have been explained and some possible mechanisms of turmeric and ginger pharmacological effects, the possibility of their application in the treatment of depression is significant. **However, it is surprising, that the vast majority of behavioral testing on turmeric and ginger takes into account only TOTAL EXTRACTS from these plants**. Despite the diversity of applications indicated by rhizomes of turmeric and ginger, the scientific literature still lacks data on the activity of the individual active ingredients.

The proposed methodology will be based on a luminescent assay used so far in in vitro tests, with no information given on the actual nature or structure of the active ingredient. In conjunction with an analytical platform, it will enable both the antidepressant activity assessment, and also the recognition of the molecular weight of a particular active compound responsible for the antidepressant action. **The proposed methodology will be elaborated for the first time for antidepressant properties.**

The undertaken project includes also the isolation of compounds which will be found active against depression from the extracts, using a modern purification technique, namely counter-current chromatography. The compounds isolated with its help will be directed to in vivo tests on mice to check the activity of the platform and to investigate the mechanism of action of these new potent drugs, also when administered with the medicines currently used in the market. These connections may shed new light on the therapy of depression, as may lead to a decrease of therapeutic dosages of commonly used medicines. The applied isolation technique may be also applied on a large, industrial scale.