Depressive disorders are among the most common mental illnesses. According to data from 2006, neurosis or depression affects about 151 million people worldwide. In Poland 7.4% of population suffers from these disorders, giving them 6th place among chronic diseases. Such data fully explains not only diversity of commercially available antidepressants, but also a need to develop drugs, that are safer and more efficient.

When dealing with safety of using antidepressant drugs, one cannot omit the fact that one of the most commonly used group of antidepressants (selective serotonin reuptake inhibitors, SSRI) are metabolized in human body by the same enzymes, as statins, drugs used to treat hyperlipidemia. Given the fact, that hyperlipidemia is also a very common chronic disorder, co-administration of anti-depressants (SSRI) and statins often leads to increased occurrence of adverse drug reactions , as a result of drug-drug interactions.

The aim of presented study is to examine 42 arylpiperazines (analogues of buspirone, an anti-depressant and anxiolytic drug) which are potential candidates for new drugs, for their safety in multi-drug therapy. Project assumes designation of half maximal inhibitory concentration (IC50) in in vitro conditions. IC50 value allows to compare how the studied compound influences the metabolism of other groups of drugs, which – in other words – is the risk of occurrence of drug-drug interactions. One of the aims of presented study is to develop quick and reliable procedure allowing for IC50 value designation in laboratory conditions. Acquired results will be further used to create a mathematic model, that will allow a prediction of IC50 ¬value, without the need for complex, expensive and time-consuming series of experiments. Comparison of designated values for number of compounds will enable an evaluation of their safety in multi-drug therapy. The only elements required will be three-dimensional structure of studied compound, and enough computing power allowing for advanced calculations of the before-mentioned structures.