„Date-rape-drug" pills as a social and analytical challenge - developing a methodology for rapid detection of psychotropic substances in pills and biological materials collected from victims"

The main goal of the project is to extend knowledge on developing an innovative methodology for rapid detection of psychotropic substances in pills „Date-rape-drug" and biological materials collected from victims.

According to the European Network of Forensic Science Institutes (**ENFSI**) and The Drugs Working Group **(DWG) statistics**, the use of alcohol and other psychotropic substances to facilitate sexual assault has been **increasingly recognized in the last 15-20 years** at the World. This phenomenon is often called drug-facilitated sexual assault (DFSA).

The first problem to be solved in this project will be to examine the most popular psychotropic substances using in such kind of cases. We will development a modern methodology for identifying the active ingredients in **pills „Date-rape-drug" and in biological samples such as: body fluids (oral fluid/saliva, blood, urine** taken from victims). We are going to use quick and innovative techniques (Direct Probe Mass Spectrometry, DIP-MS) for pills analysis and more advanced, separation techniques (such as: CE-MS/MS and UHPLC-MS/MS) for biological sample analysis, moreover the preparation stage will be with Green-Chemistry ideas realized.

The next very important goal/stage is to check all possibly **interaction between drugs (such as: benzodiazepines) and other psychoactive substances**, such as: GHB (4-hydroxybutanoic acid) and its precursor GBL (γ-butyrolactone). Other substances in the „date-rape-drug" pill composition are ketamine, chlorate hydrate, PCP (phencyclidine), DXM (dextromethorphan) etc., which are added to in secured rape tablets. This is important knowledge necessary to evaluate the tested substances in both kind materials (pills and body fluids) and chemical properties of determined psychoactive substances, as well as the possibility of their **detection in miniaturized systems.**

The final methodological challenge of this project is to developed the miniaturized systems based on the lab-on-chip philosophy dedicated to solid pills and body fluids analysis. **„The TOP of the Science"** - development of the new methodology - for the rapid detection of psychoactive substances in potential intoxicants.

We pose the hypothesis that miniaturized and universal systems dedicated to detecting Date-rape-drugs/substances are not yet available in Poland; so we plan to design, construct a model and test it, and for the first time use it in practice. **We strongly believe that this type of miniaturized systems will be a tool that help identify new directions in analytical chemistry, as well as contribute to alternative diagnostics and improve a social security.**