

Each scientific epoch regardless of its length has its own pressing problems, for example, civilizations' diseases. In 2020, the COVID-19 pandemic situation completely redesigned the approach for disease detection, especially chronic ones. When the medical staff was focused on the fight against SARS-cov-2, other diseases have taken their tolls, such as diabetes and non-alcoholic fatty liver disease. Therefore the development of novel techniques for early detection of these illnesses started to be important as never before. The main goal of the project is to develop the technology for rapid bio-sensors fabrication based on metallic layer deposition. For this reason, over the past three decades, surface plasmon resonance (SPR) has been considered a key technology for biological and medical sensors. Since 1990 when Biacore (now Cytivia) introduced the first commercial SPR-based device, the number of publications containing data collected from commercial biosensors has significantly increased. The SPR detection technique has been developed for over 40 years and has been validated in various applications such as bio-sensor and gas detection. Although, the novel technological possibilities pave the way to enhance the 3S parameters of the sensors, i.e. sensitivity, selectivity, and stability. Thus, the main goal of the project is to develop novel SPR-based bio-sensors based on the combination of the TDW/GLAD technology, i.e. TDW – thermal dewetting, GLAD – glancing angle deposition. Within the project, the fundamental research will be conducted to determine the technological parameters that have to be done for the enhanced sensitivity of the SPR-based sensors, for example in terms of fabrication of nanostructured metallic films. It has to be underlined that for the final outcome of the bio-sensors several elements have to be taken into accounts, such as the SPR sensing platform, biofunctionalization, the measurements methodology, and the subject of the detection. All elements need to be developed with the highest precision and repeatability to enable scalable production of cheap and widely available sensors, for example for screening tests of civilization diseases such as NAFLD and diabetes. Within this project, the first step in this field will be a subject of research and hopefully, it will be positively delivered to a wider scientific audience.