

ABSTRACT

The target of the diploma thesis is the automation of the manual preparation of anti-COVID-19 magnetic immunosorbent.

The theoretical part of the work is focused on the research processing of information about the SARS-CoV-2 virus causing the disease COVID-19. The basic characteristics of the disease, its causative agent, clinical picture, methods for detecting the SARS-CoV-2 virus in the human body, and treatment are described here. Furthermore, the principle of the LIS method is described here and the methods of its use in other areas of analysis are described here.

The experimental part describes how the manually demanding batch method for antibody immobilization on magnetic particles was converted to an automated method in the Lab-In-Syringe (LIS) system. To convert the batch method to LIS, a series of experiments, optimizations, and searches for analogies were carried out to fully automate the method with minimal operator involvement. Using the device, we prepared anti-COVID-19 immunosorbents, which were subsequently tested using the PCR method on patient samples in the laboratory of the University of Pardubice with BSL 3 protection

Keywords: COVID-19, SARS-CoV-2, magnetic particles, Lab-In-Syringe, LIS