

The main aim of the project is to develop a fast, efficient, affordable, and portable SPR sensor kit for label-free detection of COVID-19 molecular targets. The project will focus on exploiting the properties of localized surface plasmon resonance (LSPR) of the gold nanoparticles in label-free detection of COVID-19 molecular target. The flow cell integrated with the SPR instrument allows performing fast, label-free detection of the COVID-19 molecular targets in liquid media. The SPR sensor chip functionalized with SH-RdRp-COVID-C receptors will allow to captured target RdRp-COVID sequences in the virus. Upon hybridization of two complementary strands, the LSPR peak of gold nanoparticles will exhibit a red-shift, indicating the presence of RdRp-COVID oligonucleotide in the sample. After testing the sensor's sensitivity, stability, reliability, reproducibility, and the benchmark of the SPR sensor kit will be established. Fig. 1. shows (a) schematic of the gold nanoparticles fabrication process by the thermal dewetting process, (b) Design of the proposed SPR sensor kit, and (c) surface modification of gold nanoparticles with SH-RdRp-COVID-C receptors and subsequent hybridization with target RdRp-COVID oligonucleotide sequence.

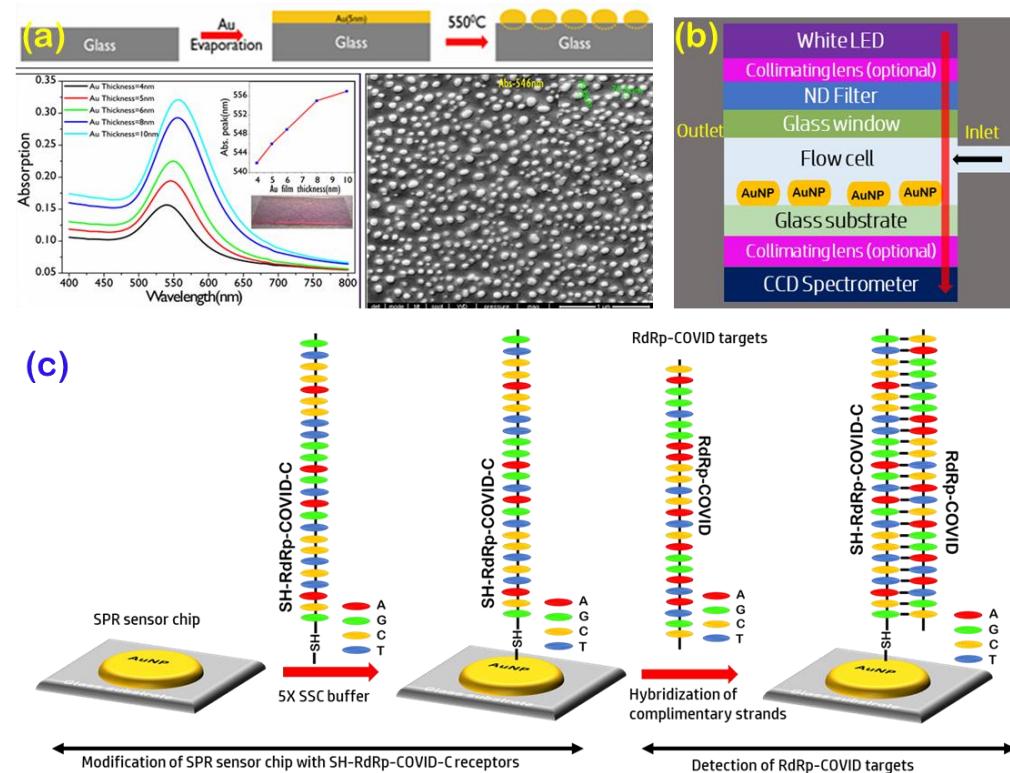


Fig. 1. (a) Schematic of the gold nanoparticles fabrication process by the thermal dewetting process, (b) design of the proposed SPR sensor kit, and (c) Steps describing surface modification of gold nanoparticles with SH-RdRp-COVID-C receptors and subsequent hybridization with target RdRp-COVID oligonucleotide sequence.