Development of SARS-CoV-2 Virus-Like Particles

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The COVID-19 (Coronavirus Disease 2019) pandemic has stimulated the scientific world to intensify studies aimed at developing quick and safe ways of detecting viruses in human body and treating the associated diseases. As many viruses constitute a serious threat to human life and health, studies on them can only be performed in certified laboratories that follow strict safety procedures. Due to this, development of "deactivated" virus molecules or safe to use virus-like objects that mimic the real virus and allow performing virus-related studies in any research unit, constitutes an important scientific challenge. One group of such species are the so-called virus-like particles (VLPs) in which the capsid of the virus is replaced with a synthetic core to which the real virus proteins are being attached [1,2].

We have developed a method for the preparation of VLPs that imitate the virus responsible for the COVID-19 disease – the SARS-CoV-2 (Severe Acute Respiratory Syndrome Coronavirus 2). The particles consist of Au cores surrounded by "coronas" of S1 domains of the real virus's Spike proteins. Besides being safe-to-use, the VLPs are characterized by the presence of the so-called localized surface plasmon resonance (LSPR) in gold cores, which allows utilizing the fabricated particles in biosensing and bioimaging applications [3].

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