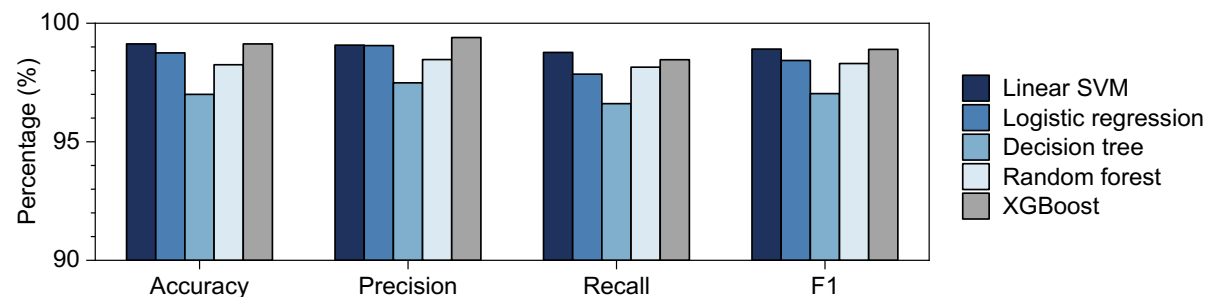
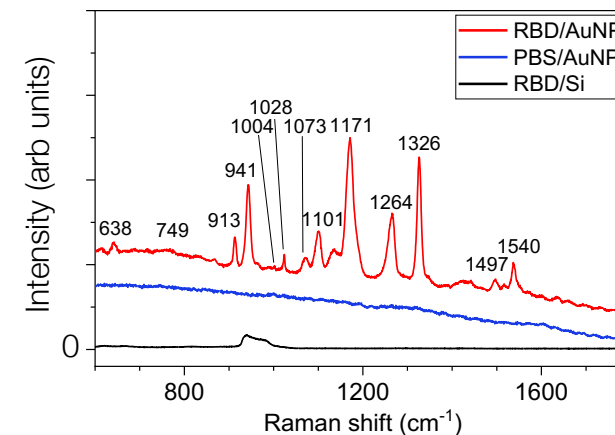
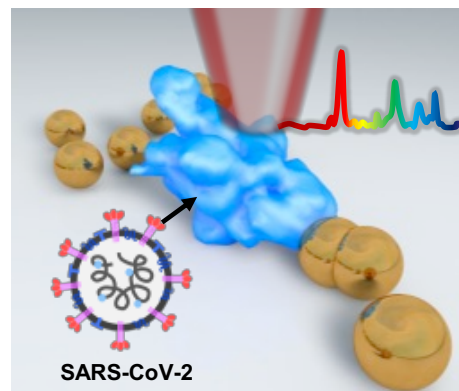


Kunyan Zhang, Shengxi Huang (Rice University)

MRSEC researchers optically identified an important protein component of the SARS-CoV-2 virus using optical spectroscopy and machine learning, with a 97% accuracy in distinguishing between different viruses. This work provides an in-depth understanding of the optical properties of SARS-CoV-2 virus and paves the way for rapid analysis and discrimination of infectious diseases.

The detection platform used gold nanoparticles to enhance the optical signals. The IRG is developing optical sensing based on two-dimensional gold and other metals. Understanding the stability of the SARS-CoV-2 protein in contact with metals of different forms is essential to develop reliable and sensitive sensors.



Top right: Schematic detection of SARS-CoV-2 protein by optical spectroscopy.

Top left: Raman spectra of SARS-CoV-2 protein enhanced by gold nanoparticles.

Bottom: Machine-learning classification of SARS-CoV-2 RBD and MERS-CoV proteins with different classifiers by four metrics.