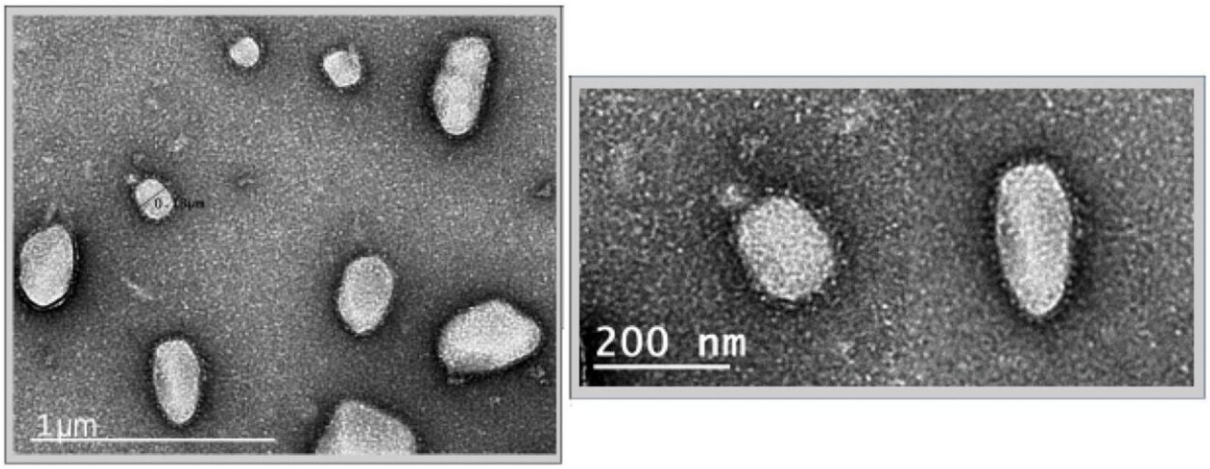
Medical Xpress

A COVID-19 vaccine breakthrough reported

August 19 2020



Electron microscopy (EM) images of SARS-CoV-2 Virus-like Particles (VLPs) showing the typical spikes radiating from the surface of the particles. These structural mimics of the native virus are being used to develop a COVID-19 vaccine. Credit: City College of New York

The CUNY School of Medicine at The City College of New York and TechnoVax, Inc., a biotechnology developer of novel vaccines, announce a breakthrough in their collaborative effort to develop a vaccine for COVID-19. Scientists from the two organizations have generated and characterized SARS-CoV-2 virus-like particles (VLPs) which are structural mimics of the native virus in size, morphology and surface composition but devoid of viral, infection causing, genetic material. These features of the VLP platform make it an ideal candidate for

COVID-19 vaccine development.

This technology has a proven track record as evidenced by the success of vaccines directed against human papillomavirus virus (HPV) and hepatitis B virus (HepB) which have been proven both highly effective and exceedingly safe in stimulating immune responses. The CV-19 VLPs were assembled in a suspension culture of mammalian cells from both the coronavirus structural elements as well as uniquely modified surface spike molecules specifically designed to ensure stability, abundance, and most importantly the immunogenic properties known to be essential for creation of a highly effective vaccine.

Electron microscopy studies of purified VLPs reveal that there is not only a high frequency of spikes projecting from the surface of the particles, but that the morphology of the structure also resembles that of the native SARS-CoV-2 virus. CCNY researchers Paul Gottlieb and Reza Khayat noted that the stabilized surface spikes are expected to be highly immunogenic.

"This innovation is most likely to accelerate the development of a COVID-19 vaccine in that it utilizes a proven technology that is distinct from current COVID-19 vaccine candidates," said Jose Galarza, CEO, TechnoVax.

"The CUNY School of Medicine, the newest addition to City College, continues, with this avenue of research, the College's established tradition of directing our research efforts where they are most needed by society," said CCNY President Vince Boudreau. "The search for a COVID-19 vaccine is among the most important research efforts of our day and we are proud that researchers working on our campus have turned up such a promising avenue of advancement."

Overall, CCNY and TechnoVax are committed to the advancement of

the development of a safe and effective VLP based COVID-19 vaccine and are entertaining inquiries from potential partners to collaborate on these efforts in order to expedite this work and bring to fruition a successful alternative vaccine solution with great potential for stemming this destructive pandemic.

Provided by City College of New York