

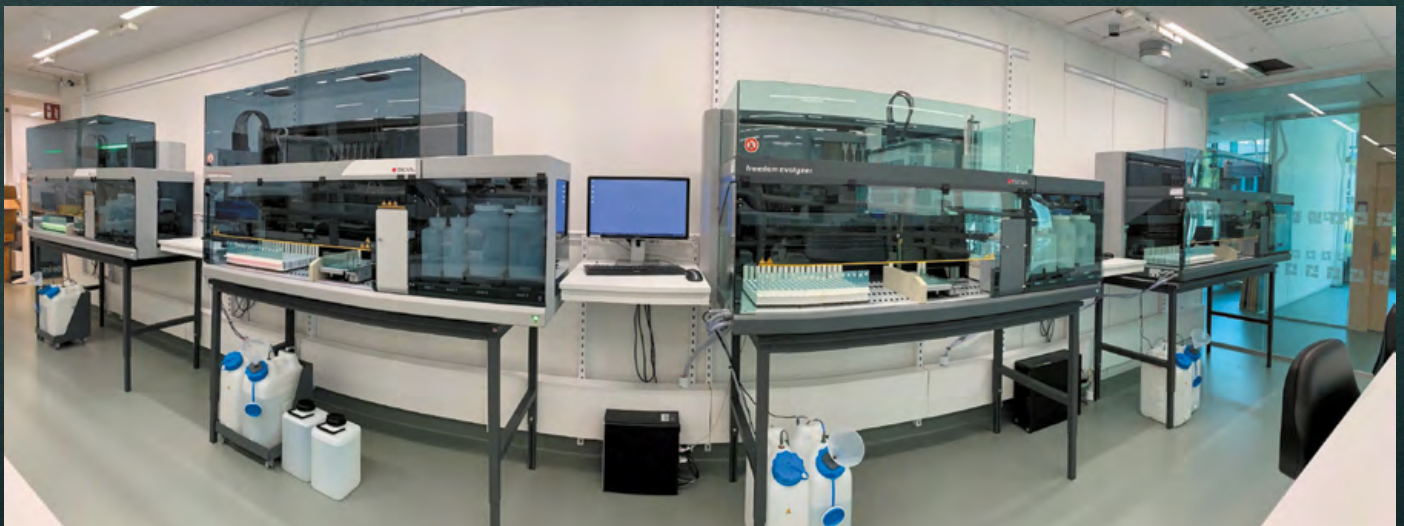


# Responding to a pandemic

**SARS-CoV-2 has hit the world by storm and testing has had a major part to play in the fight against the virus, helping to track cases and slow rates of infection. ABC Labs, based at the Karolinska campus in Stockholm, was founded soon after the start of the pandemic with the specific purpose of establishing large scale and high quality PCR and ELISA COVID-19 testing in Sweden. The laboratory analyzes thousands of tests on a daily basis in partnership with the country's Public Health Agency and a number of regional and private healthcare providers, to help stop the virus.**

Appropriate and timely testing during pandemics helps to save lives by ensuring that infected individuals are given the appropriate treatment, isolated to reduce further transmission, or confirmed as having had the disease and classed as immune. ABC Labs – which stands for influenza A and B, and coronavirus – is a relatively new company that was formed in April 2020. Ola Winqvist, Medical Director and Chief Scientific Advisor, explained: “We quickly identified a need for rapid detection of the SARS-CoV-2 virus but, at the time, the available testing capacity in Sweden was very low. The private Wallenberg Foundation donated a large sum of money to set up a lab to help improve the situation and, soon after, I was approached by the Norrskan Foundation to head a second private testing initiative. We originally started with 900 m<sup>2</sup> of empty lab space and had to discuss how we were going to go about this new project, decide on what systems we would need, and begin to write a quality management system; it's certainly an interesting way to start a lab!”

“From the beginning, it was evident that while testing for the virus would be vital, testing for a response to past infection would be equally as important. Our main workflow was initially private ELISA testing, but demand dropped dramatically when the Swedish government made testing free for anyone with symptoms. Since then, our growth has come from offering the analysis of self-sampling PCR tests as an official partner of the Public Health Agency, and we are now serving 11 out of 21 regions, with our workflow continuing to expand. In June, we were testing hundreds of samples a day, and this quickly rose to 2,000 a day by the end of July. This increase continued; by the beginning of September, we were analyzing 10,000 samples daily, and it's now approaching 20,000. We have also seen a growth in positive results from 2-3 % in June to almost 25 % in some regions. The serology side is also picking up again; we are serving the south of Sweden with ELISA testing to provide IgG, IgM and IgA analysis, to get a better understanding of when an individual



ABC Labs uses a suite of Tecan laboratory automation workstations to meet the throughput demands of SARS-CoV-2 testing

“The beauty of the Tecan platforms is that they are easy to program and are adjustable to our needs.”

has encountered the virus and how well they have developed immunity.”

Ola continued: “When you are looking at thousands of samples, you really need to have an automated system. We wanted to make sure that we started with state-of-the-art equipment and, with my background in clinical immunology, my initial thought would always be a Tecan system. We quickly acquired our first Fluent® workstation and a thermal cycler to conduct the PCR-based tests for current infections and, shortly after, added a Freedom EVOlyzer® to perform ELISAs for antibody detection, looking at past infections. We now have a total of eight Tecan instruments – four Freedom EVOlyzers, one Fluent, two Freedom EVO® 100s, and one Freedom EVO 200 – and we’ve just ordered the ninth!”

“The beauty of the Tecan platforms is that they are easy to program and are adjustable to our needs. When we only had small numbers of PCRs, the Fluent handled the entire workflow, including pipetting from the tubes, getting deep-well plates ready for extraction, adding magnetic beads for clean-up, and performing the extraction. However, we quickly figured out that by breaking up parts of the workflow to different Tecan platforms, we could improve our efficiency and increase throughput to deal with larger numbers of samples. Now, one platform is setting up the reagents, another is performing the extraction, and then one of the Freedom EVO 100s is preparing the master mix PCR plate, while the other takes the extracted RNA and master mix plate and combines them. This has helped us leap from processing 20 to 100 plates a day, an astonishing increase. We are now also adding an extraction-free method that will allow us to put sample volumes from the specimen directly into the

PCR mix and help us reach our goal of 20,000 samples a day.”

“The Freedom EVOlyzer is also so easy to use and there is very little hands-on time, helping to reduce human error and improve our reproducibility. We simply feed the platform with racks of barcode-labeled tubes filled with serum samples and reagents in different slots and positions, and away it goes. The automation saves us so much time, and the results go through semi-automated analysis before being released to the customer via an electronic LIMS, making the process even more streamlined.”

“The Tecan team has been great throughout, working with us to perform validations quickly and efficiently, and assisting us with software development early on. They have also helped us to navigate the logistics of the COVID-19 situation, to acquire new and used equipment, and to borrow different systems from labs that have had to shut during this period, to help fulfil our needs. Now that our services are so busy, and with the number of Tecan instruments we have, we are working with Tecan almost every day to continually optimize and adjust our processes – and I mean this in a good way! In my mind, Tecan is linked to knowledge and always delivers, and this partnership has been so successful that we are now validating a blood cell capillary test together for COVID-19 too. The demand for our testing will of course change with the spread of this virus, including distinguishing between COVID-19 and influenza, and we are also looking at expanding our services into HPV screening. Our overall goal is to become a leading European center for disease and pandemic management, so that we are better prepared next time,” concluded Ola.

To find out more about Tecan's lab automation solutions for SARS-CoV-2 testing, visit [www.tecan.com/covid19](http://www.tecan.com/covid19)

To learn more about ABC Labs, go to [abclabs.se](http://abclabs.se)