



A beacon of light in the coronavirus pandemic

UK Biocentre has been central to the UK Government's response to the COVID-19 pandemic, repurposing its entire facility to become a national center for SARS-CoV-2 molecular testing. To help meet an ambitious target of 100,000 tests per day across the country, the organization has established a new mega-lab, partnering with Tecan to design and commission a suite of liquid handling automation platforms in just a few weeks.



UK Biocentre is a government-funded, not-for-profit company based in Milton Keynes. It was originally established to receive, process and store vast numbers of biological samples on behalf of large academic research projects across the country. Prior to the COVID-19 pandemic, this world-leading sample management and high capacity bioprocessing facility received hundreds, or even thousands, of predominantly blood samples each day for processing, DNA extraction, and storage in its large automated biobank. These samples were then made available on request to participating research groups.

The situation changed dramatically in March 2020, when UK Biocentre was approached by the government to become a national coronavirus testing center, part of the UK's network of newly constructed Lighthouse Labs, a nationwide group of mega-labs set up to dramatically increase the capacity for SARS-CoV-2 testing. UK Biocentre CEO Dr Tony Cox explained: "We had been watching the pandemic sweep across Asia and into Europe, and knew what was coming. On the 19th of March, the UK government, recognizing our experience in processing large numbers of samples, approached us


about repurposing our entire laboratory, turning it into a national coronavirus testing center with a capacity of delivering tens of thousands of tests per day."

Tony continued: "We discussed the size and importance of the challenge as a team, and started planning exactly what we would need to deliver that scale of testing in a short time period. As we were being asked to increase our throughput by several orders of magnitude, it was clear that we needed to reach out for help, and that a highly automated process was essential to deliver the scale required at a national level."

"Within nine weeks, we had completely refitted a 35 by 15 meter empty space as a new mega-lab and grown from a staff of 47 to 300, predominantly made up of volunteer lab scientists. We now have a suite of 24 Freedom EVO[®] liquid handling platforms that provide rapid, coordinated sample processing, with the capacity to process tens of thousands of samples each day and turnaround times of just a few hours. At the moment, the testing kits we receive contain live virus, which must be deactivated in a Class IIA biosafety cabinet before the sample can be processed. That's quite



Automation has been key to the UK Biocentre's ability to rapidly scale up molecular testing



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a bottleneck in the workflow. However, the formulation of the swab testing kits will soon be changed to include an inactivating buffer, eliminating the need for this step. We will then be able to safely unpack the samples and place the tubes straight into racks and onto our automated platforms without using biosafety cabinets, which will significantly increase our processing capacity. The entire automated workflow is connected to Tecan’s Introspect™ software, which provides valuable real-time information on sample throughput and consumables usage, effectively monitoring productivity to help the lab process samples as efficiently as possible and avoid unnecessary delays.”

“We are continuously scaling up testing to meet demand and are preparing to deliver testing levels at least one, and possibly two, orders of magnitude higher than our current capacity. It’s a huge challenge, but it’s achievable thanks to the support of our volunteers and by working with our partners to further streamline the automated workflow. It’s not just about installing and commissioning the Tecan systems; it takes an immense logistical and procurement effort to maintain a constant supply of reagents and consumables to keep the



With so many Tecan systems in one lab, each instrument has been given its own name

instruments running. Our processes are continually being optimized and developed, and Tecan’s field application specialists are working side-by-side with us to achieve this.”

“There’s nothing like being set an extraordinary challenge to pull teams together and bring out the best in people to achieve success. The sheer investment of time and energy, in a shared effort to make it all work, has been quite astounding. I’ve been really pleased with the response from Tecan,

and I’m not sure that I could ask an awful lot more. It’s been fantastic,” Tony concluded.

To find out more about Tecan’s solutions for COVID-19 testing, visit www.tecan.com/covid19

To learn more about UK Biocentre, go to www.ukbiocentre.com