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Arizona State University

ASU's Biodesign Institute plays critical role in combating COVID-19

The Arizona State University Biodesign Clinical Testing Laboratory (ABCTL) was launched in March 2020 to quickly and accurately detect coronavirus for individuals who may have been exposed to the SARS-CoV-2 virus. To do this, the academic team retooled their expertise and high throughput diagnostic testing capabilities established during a $40M project for the Biomedical Advanced Research and Development Authority, and immediately adapted an FDA emergency use authorized diagnostic test.

In the early days of the pandemic, Joshua LaBaer, the executive director of the Biodesign Institute at ASU, and Vel Murugan, associate research professor at Biodesign, assembled a team of more than 50 volunteers from across the university and partner organizations to scale the capacity for testing essential workers across Arizona. ABCTL quickly gained traction for testing nasopharyngeal (NP) swab samples, and by employing a diagnostics platform, testing rapidly grew to as high as 7,400 samples per day. As of mid-August, ASU processed more than 893,228 tests.

Since aggressive widespread testing and timely delivery of results is critical to prevent community spread, the ASU community stepped up to focus its capabilities and know-how to help the state fight the pandemic. The team quickly organized an academic lab into a new clinical lab. Using robotic automation, it processed tests in 24-48 hours, quicker than other lab processing times.

After organizing NP swab drive thru testing for first responders, ABCTL quickly pivoted to a less costly and safer approach to scale testing through the use of the one of the country's first saliva tests for coronavirus. This alleviated one of the bottlenecks of diagnostic testing to quickly obtain samples. Even with a highly trained medical staff, medical providers had been limited to an average of 100 people with the NP swab collection in a four-hour window of drive-thru testing. The goal of the saliva tests was to overcome these obstacles. As a less invasive diagnostic, saliva testing for the virus was warmly welcomed in Arizona.

In addition to being less invasive, saliva tests offered several benefits over the NP swab tests. While providing the similar accuracy and sensitivity, the saliva tests are safer and require less personal protection equipment and labor to administer. Since nurses and testing supplies were in high demand for patient care, not requiring them for testing allowed the team to scale the volume. For example, at one of the first public test sites ABCTL hosted, the team collected 1,000 samples in only four hours. With needing only a test tube and a straw, the test site needed fewer staff and less than half of the supplies that had been required for previous NP swab testing sites.

With a shared goal to rapidly increase statewide diagnostic testing, the Biodesign Institute made its protocols readily available to other commercial and academic partners so they could adapt their instruments to perform saliva-testing.

At the beginning of the clinical lab's formation, LaBaer started early morning Zoom calls with ASU volunteers seven days a week. He believed that such fast organization with a new team required constant communication, and everyone should know what the priorities were for that day. The team continues to meet every morning. And LaBaer ends each call with the rousing call, "Let's go save some lives!"