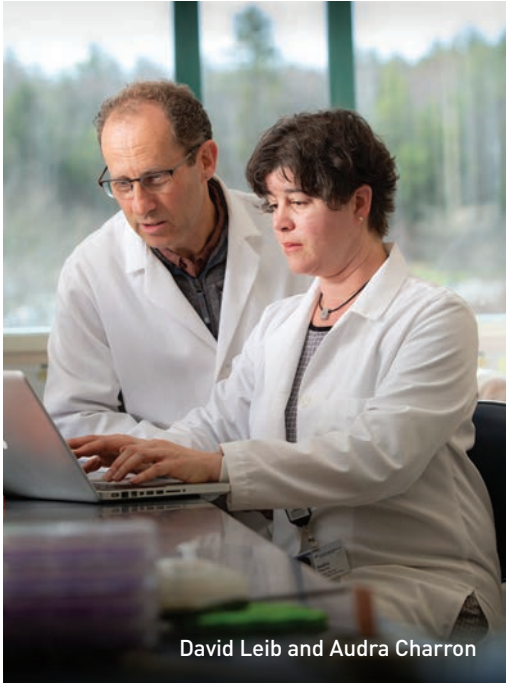


Photos by Mark Washburn



David Leib and Audra Charron



Joel Lefferts

FAST-TRACKING THE BATTLE AGAINST COVID-19

THE GEISEL SCHOOL OF MEDICINE IS WELL-KNOWN FOR ITS COLLABORATIVE CULTURE, WHICH HAS BEEN A BOON TO THE SCHOOL'S TRANSLATIONAL RESEARCH EFFORTS. The ability to rapidly move scientific discoveries from the lab to the clinic is especially important to efforts to combat the COVID-19 pandemic.

In late March, virologist David Leib, PhD, a professor and chair of microbiology and immunology at Geisel, was contacted by CoVelocity, an Israeli non-profit consortium interested in bringing diagnostic tests for COVID-19 to underserved communities throughout the world.

The consortium had a promising new test being made by a small biotech company in California called Atila Biosystems. However, it had only limited testing in China and needed U.S.-based validation to bring it to market. They asked Leib, who is working with a number of partners internationally to combat the pandemic, if he could fast-track testing of this potentially life-saving test.

Leib explained that he was not a coronavirus expert but agreed to review information about the new test to see if he could help. "As soon as I looked at it, I could see that it was just a PCR (polymerase chain reaction) amplification process, something we do all the time in our herpes research, where we look for rare viral

genomes in infected tissues," he explains. "This was no different—it's just that you're looking for viral genomes in a patient sample from the nose."

Leib agreed to join the project and had to look no further than Dartmouth-Hitchcock's (D-H) Laboratory for Clinical Genomics and Advanced Technology (CGAT), located near his own lab in Geisel's Williamson Translational Research Building (WTRB), for help in validating the new test.

"We were able to provide the initial positive and negative patient specimens to David and his team that we deidentified, so they could run a blinded test to see how the Atila assay held up against real clinical samples," says Joel Lefferts, PhD, assistant director of the CGAT, who collaborated with Leib and Audra Charron, PhD, a research scientist in his lab, on the project. Lefferts and the CGAT are also part of the Department of Pathology and Laboratory Medicine at Geisel and D-H.

The Dartmouth team, together with another lab running the same experiment at the Medical College of Wisconsin, saw 100 percent concordance with the test results when comparing the new Atila test kit to the FDA-approved test from the CDC that has already been in use.

"We're now in the final stages of the validation process. The data we've generated so far allowed the company to file for an emergency use authorization from the FDA, which was recently approved and sufficient for them to begin marketing and selling the test," says Leib, who, while not a stakeholder in the project, is excited about the new test's potential.

So is Lefferts. "In our lab, we have an automated platform that works well for high-volume testing, but we've realized we need a more rapid test available for emergency cases in the hospital," he explains. "There are a lot of options out there, but it's very difficult to get the supplies to run those tests.

"Some of the key advantages of the Atila assay are that it does not require a separate step to extract RNA from the virus, the supplies are more readily available, and it would allow us to get results in 1-2 hours versus 12-24 hours," says Lefferts. "So, we're in the middle of getting this validated for use in our own lab. We're hoping everything continues to work smoothly and we can have this available very soon."

"Joel has been a wonderful partner in this," says Leib. "And the physical proximity and collaborative environment that the WTRB provides us with has been important to our efforts."

Opened in 2016, the state-of-the-art, six-story building, which is seamlessly integrated into Dartmouth-Hitchcock Medical Center's Lebanon campus, is designed to make collaborations between scientists—such as biomedical researchers, engineers, data scientists, physician-researchers, and health policy analysts—and their clinical colleagues, easier than ever before. The WTRB is named in honor of Dr. Peter Williamson and his wife Susan, who made a landmark \$20 million gift commitment to Geisel towards the building in 2007.

"Usually when you talk about a translational research project it's on the scale of years," says Lefferts. "It's exciting to think about how quickly this came together and how soon we may have it for use in clinical care. I've really enjoyed working with David and his team—it's worked out really well, I think, for everybody involved."

TIM DEAN