

GEISEL GOES VIRTUAL

BY STEPHEN MCALLISTER D '77

WHEN DARTMOUTH COLLEGE'S COVID-19 TASK FORCE ANNOUNCED ON MARCH 3

that an employee of Dartmouth-Hitchcock had tested positive for coronavirus, John F. Dick III, MED '03, interim senior associate dean for medical education and member of the task force, understood the need for social distancing on campus and quickly organized a team to begin planning for remote learning at Geisel.

Before restrictions on the size of gatherings on campus were set, a medical school team of Geisel faculty, information technology, classroom services, and medical education staff began working collaboratively and tirelessly to make remote courses a reality. A few days later, the College and the hospital would announce reductions on meeting size and social distancing guidelines, which would make it difficult for any class at Geisel to be in person.

By March 10 large group classes were online and by the end of March Geisel's entire first- and second-year curriculum could be taught remotely via Zoom. Per recommendation of the Association of American Medical Colleges, clerkships for third- and fourth-year students were suspended across the U.S.

Geisel was in a good position to transition to remote learning because the school already had lecture hall recording systems with streaming capabilities and a thoughtful implementation of materials on Canvas, a web-based learning management platform used to create a virtual classroom.

Even so, there were challenges—faculty and instructors required training to effectively use the Zoom app to teach, but before training them our education support teams needed to

become adept at using this tool themselves. Beyond that, Zoom faced security and privacy challenges as more and more people around the world began to depend on it for teaching, collaboration, and socializing, forcing the app maker to rapidly push out changes to default setting for educational customers, such as screen sharing, to improve security. To balance security with ease-of-use, IT is constantly monitoring these changes, addressing them, and quickly communicating them to faculty.

Maintaining the interactive learning experiences Geisel students are accustomed to required creativity. “Fortunately,” Virginia Lyons, PhD, associate dean for pre-clinical education and a member of the team said, “we have an excellent computing team who quickly identified virtual tools to promote collaboration and that allowed us to preserve faculty-to-student and student-to-student interactions.”

Currently, the College plans to extend remote learning efforts through the summer. Plans for the fall term have not yet been announced.

Stephen B. McAllister is director of computing at Geisel School of Medicine.

STUDENTS ORGANIZE TO SUPPORT HEALTHCARE WORKERS

NATIONWIDE, MEDICAL STUDENTS ARE RESPONDING TO COVID-19 by helping beleaguered healthcare workers in their communities. At Geisel, medical students are providing non-clinical support to Dartmouth-Hitchcock Medical Center (DHMC) in the Upper Valley.

Taryn Weinstein, director of Student Affairs, says as soon as news of the pandemic broke, students wanting to jump into action began launching projects—gathering personal protective equipment (PPE) and providing childcare—then reached out to the Student Affairs office seeking help with organizing volunteering at DHMC.

“I was initially connected with Jeffrey O’Brien to help coordinate opportunities at the hospital,” Weinstein says. O’Brien is the senior vice president of Clinical Operations at DHMC. Since then she has been working with Laurie Emanuele, director of fiscal and academic affairs and research, community and family

medicine/population health at DHMC, to place students into volunteer roles at the hospital. “It took a few weeks for us to settle what students would be doing because of the rapidly changing situation and to ensure compliance with the Association of American Medical Colleges guidelines, which strongly advise against medical students taking on clinical roles at this time.

“The collaboration between the hospital and Geisel has been wonderful. Everyone wanted to bring these volunteer experiences together so our students who wanted to be involved could do it safely.”

By late April, 21 medical students were

deployed to DHMC's supply chain operations—distributing supplies to various areas of the hospital as runners. Others are helping RNs with calls to the hospital's COVID-19 Hotline, supporting telehealth development, and helping with Aging Resource Center and Pediatrics Family Support Check-in calls among other remote, yet vital roles.

Additionally, several independent medical student-driven projects are underway, including collecting PPE from Upper Valley businesses for distribution to rural hospitals and providing virtual academic support to local middle school students.

“We are so proud of our students who are extraordinarily motivated and professional—they are amazing,” Weinstein says. “Their level of adaptability and perseverance in trying to find ways to support their community, patients, and each other is incredible. They inspire me every day.”

SUSAN GREEN

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

DARTMOUTH RESEARCHERS RAMP UP EFFORTS AGAINST COVID-19

As communities across the country and world struggle to cope with the devastating effects of the COVID-19 pandemic, researchers at Dartmouth's Geisel School of Medicine are collaborating with their scientific and clinical colleagues on a myriad of projects in an effort to enhance understanding of the disease and develop potential life-saving treatments. On March 18, the Laboratory for Clinical Genomics and Advanced Technology at Dartmouth-Hitchcock Medical Center (DHMC), under the direction of **Gregory Tsongalis, PhD**, professor of pathology and laboratory medicine, became one of the first labs in the country [outside of state health laboratories and the Centers for Disease Control (CDC) to begin testing people for the coronavirus. Early preparation and testing of new protocols for COVID-19 allowed the lab to get up and running quickly when the FDA granted an emergency use authorization to hospitals and academic medical centers. The lab has the surge capacity to process 1,000 samples in 24 hours, has helped the State of New Hampshire reduce its backlog of tests, and is investigating new methods for more rapid testing. (See *Tsongalis Q&A*, pg. 5)

IN A COLLABORATIVE EFFORT INVOLVING

Peter Wright, MD, professor of pediatrics at Geisel, colleagues from biotech firm Adimab and the University of Texas - Austin, **Margaret Ackerman, PhD**, professor of microbiology and immunology at Geisel and professor of engineering at the Thayer School of Engineering, and **Jiwon Lee, PhD**, assistant professor of engineering at Thayer, are studying the breadth of antibody responses developing in patients who have recovered from COVID-19, as well as those who have not had the disease but have been exposed to other types of coronaviruses. The groups are working on profiling and isolating the most effective of these antibodies for use as therapeutics and to inform potential vaccine efforts.

DAVID LEIB, PHD, chair and professor of microbiology and immunology at Geisel and adjunct professor of biology at Dartmouth, and **Joel Lefferts, PhD**, associate professor of pathology and laboratory medicine at Geisel and assistant director of the Laboratory for Clinical Genomics and Advanced Technology, have teamed up to validate and adapt for clinical use a new rapid-method COVID-19 diagnostic test developed by Atila Biosystems. The Atila assay can produce results in less than one hour and received emergency use authorization from the FDA in April. DHMC is expected to be the first medical center to deploy the test. (See *Fast Tracking story*, pg. 6)

JUDY REES, MD, PHD, an associate professor of epidemiology at Geisel, has partnered with colleagues in her department and the University of New Hampshire Survey Center to develop a COVID-19 community survey to identify symptoms over a two-month period in New Hampshire in an effort to track the progress of the outbreak and factors associated with transmission. The on-line study, which includes a brief daily symptom diary and longer survey questionnaires, is being sent to a cohort of nearly 3,400 New Hampshire residents that were randomly selected and have agreed to participate in ongoing statewide research.

PAUL GUYRE, PHD, an active emeritus professor of microbiology and immunology at Geisel and member of the Immunology and Cancer Immunotherapy Research Program at Norris Cotton Cancer Center, and his lab team have received funding from the National Cancer Institute to study the increased prevalence of severe disease in COVID-19 patients over age 60. They are looking at how antibodies acquired from lifetime exposure to other coronaviruses may cross-react with SARS-CoV-2 in a way that actually worsens infection and lung inflammation and have begun to investigate the potential for human plasma to neutralize SARS-CoV-2 infection.

LED BY RESEARCHERS Jonathan Skinner, PhD, and **Elliott Fisher, MD, MPH**, both professors of The Dartmouth Institute for Health Policy and Clinical Practice (TDI) at Geisel, **Sukdith (Sukie) Punjasthitkul, MS**, infrastructure analyst in the Data Analytic Core (DAC) at TDI, and **Stephanie Tomlin, MS, MPA**, director of the DAC, the Dartmouth Atlas Project is drawing on its legacy of measuring geographic variation in the U.S. to document the geography of the COVID-19 pandemic. The research, which has generated considerable media coverage, includes collaborating with Microsoft Research to document regions with the greatest fraction of vulnerable people, interactive heat mapping to assess the spread and growth of diagnosed cases using Hospital Referral Regions, and real-time incidence and outcomes of hospitalized COVID-19 patients from about 250 hospitals nationwide.

IN A RECENT JAMA PAPER, Glyn Elwyn, MD, PhD, a professor of TDI, and his colleagues at TDI and Harvard Law School, document some of the most significant telehealth regulatory changes in response to COVID-19—including those involving payment, privacy, and licensing. They also summarize the views of key opinion leaders in telehealth, and outline the opportunities and challenges facing the healthcare system as it works to successfully harness the expanded role recently given to telehealth in the U.S.

TIM DEAN