

OADDL E-News

Special Issue

A Diagnostic Lab at the Cutting Edge of One Health – COVID-19 Testing

Introduction:

The idea of one health, which fosters a collaborative approach to issues intersecting human, animal, and environmental health, has been around since 400 BC. In recent years, the idea became a firm concept in 1964 when the veterinary epidemiologist, Dr. Calvin Schwabe coined the term “one medicine” in his book *“Veterinary Medicine and Human Health”*. In more recent years, the concept has gained ground in government agencies such as CDC and USDA, and international organizations such as FAO and OIE. Notable recent developments include: establishment of the CDC One Health Office in 2009; establishment of the USDA/APHIS One Health Coordination Center in 2012; and establishment of One Health programs in many universities across the US and worldwide.

Over the years, veterinary diagnostic laboratories have played an informal role in one health mainly through the accumulation and reporting of data on zoonotic diseases such as tuberculosis, West Nile virus, and avian influenza. The public health crisis arising from the shortage of testing capacity in the war against COVID-19 created a unique opportunity for veterinary diagnostic laboratories to formally practice one health. The Oklahoma Animal Disease Diagnostic Laboratory (OADDL) rose to the challenge, being the first veterinary diagnostic laboratory in the US to conduct large scale human COVID-19 testing in support of state efforts to combat the pandemic. This newsletter



Ms. Kaycee Forsythe (left), Ms. Ana Linthicum (middle) and Ms. Brittanie Peaks (right) processing COVID-19 samples. They are all members of the regular staff in the Molecular Diagnostics Section.

describes how this massive undertaking came together and has been sustained.

Determinants of success:

People - a prepared and committed staff:

Under the leadership of Dr. Akhilesh Ramachandran (Section Head) and Robin Madden (Lab Manager), the Molecular Diagnostic staff at OADDL routinely accepts new challenges with ready minds and a willingness to succeed. With a divide and conquer approach, the team quickly designed a plan in which our strong commitment to animal owners, practitioners and

commercial production facilities is maintained, while we stepped in to provide much needed COVID-19 testing support for our state.

By the time COVID-19 PCR testing was in full swing, the number of test requests coming to OADDL was increasing beyond the capacity of an 8-hour shift. Dr. Ramachandran quickly assembled a second shift of PCR technologists led by Dr. Sunil More comprising of Drs. Sai Narayanan, Girish Patil, Sam Jeyasingh and Parna Ghosh. The deployment of this team doubled the testing capacity. OADDL personnel were prepared and



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trained within a short period of time in the uncharted territory of human diagnostics.

Dr. Jerry Ritchey, Ms. Emily Cooper, Dr. Jerry Malayer and Dean Carlos Risco provided necessary logistic and management support to successfully undertake this mission. In particular, Dr. Ritchey and Ms. Cooper actively managed the intake of the thousands of clinical specimens arriving at OADDL daily.

Ready infrastructure:

Over the years, the state of Oklahoma and the OSU College of Veterinary Medicine (CVM) have invested substantially in building the capacity of OADDL to become a top tier veterinary diagnostic lab in the US. Established in 1975, the footprint of the lab was expanded in 2009 by adding 4,435 sq. ft. Currently, the OADDL has a total of ~11,770 sq. ft. of laboratory space, of which 1,005 sq. ft. is a BSL-3 suite and 2,377 sq. ft. is a molecular diagnostics section with two suites. Besides the bricks and mortar expansion, OADDL, with financial support from the National Animal Health Network (NAHLN) and the Oklahoma Department of Agriculture, Food & Forestry (ODAFF), has rapidly increased high throughput diagnostic testing capacity in the last 10 years. This expansion has mostly happened in molecular testing in preparation for responding to high consequence animal diseases such as avian influenza, Newcastle disease, Classical Swine Fever, Foot and Mouth Disease, Swine Influenza and African swine fever. Current animal testing capacity would allow up to 800 PCR tests per day.

OADDL has continued its animal testing unabated by the COVID-19 crisis during which caseload has remained steady. Therefore, when consideration was being made to conduct COVID-19 testing, it was important to do so without diminishing animal testing capacity. The decision was made to dedicate one of the two molecular suites to COVID-19 testing and acquire new PCR machines for that activity. The availability of adequate laboratory space and funding for new equipment made the decision easy from the infrastructure standpoint. The



Dr. Sunil Moré (Pathologist) starting his night shift preparing buffers for COVID-19 testing.

existence of a BSL-3 suite also enabled us to separate the receiving areas for human and animal specimens, with enhanced safety precautions being applied to human specimen handling.

Support from higher administration:

The success of the COVID-19 testing effort at OADDL would not have been possible without the outstanding material and moral support of all levels of the OSU Administration – from the Dean of the CVM through the Vice President for Research (VPR) to the President, as well as state support from the Secretary of Agriculture, Blayne Arthur and the Governor's office. The OSU Administration, recognizing the urgency of the situation, fronted the funds for critical testing equipment (notably three high throughput diagnostic machines). The VPR also

established an Incident Management Team, led by Assistant Dean for Outreach and Extension at the College of Engineering, Architecture and Technology Ed Kirtley, which provided critical logistics support in the early stages of the effort. Furthermore, the CVM Dean and VPR mobilized dozens of additional personnel (OSU staff required to work from home but without much remote work, temporary employees) and volunteers (faculty, students, and administrators from all over campus), whose contributions were critical to the success of the effort. Finally, a partnership with the OSU Center for Health Sciences, which facilitated the appointment of our Clinical Director, Dr. Anil Kaul, and extension of CLIA certification to OADDL for COVID-19 testing, was highly instrumental.

Current situation:

OADDL conducted COVID-19 testing on the first human samples on April 1, 2020. As of June 30, 2020, OADDL has conducted over 57,000 tests, which accounts for nearly 20% of testing for the state of Oklahoma. To meet this need, we have expanded personnel and equipment capabilities that can be dedicated to COVID-19 testing. This assures our clients and stakeholders that animal testing, always our primary mission, is unaffected by our participation in COVID-19 testing. In fact, our participation in COVID-19 testing has opened up collaborations and resources that will enhance our animal testing capabilities. These are truly exciting times at OADDL. We thank you for your continued support.

— Dr. Jerry Saliki, OADDL Director



Dr. Samuel Jeyasingh (left) and Ms. Parna Ghosh (right) are members of the COVID-19 night shift team. They are both graduate students in the OSU College of Veterinary Medicine.

For further information:

<https://www.washingtonpost.com/science/2020/05/12/this-veterinary-lab-is-linchpin-one-states-covid-19-testing-approach/>

JAVMA article: <https://www.avma.org/javma-news/2020-06-01/animal-health-laboratories-aid-testing-covid-19-people>

Oklahoma Farm Report Radio: http://www.oklahomafarmreport.com/wire/news/2020/04/00066-osua-nimaldiagnosticlab042420_174038.php#.XqwuKZlOm9u

Oklahoman: <https://oklahoman.com/article/5659782/coronavirus-in-oklahoma-how-an-animal-disease-lab-became-critical-to-covid-19-testing>

KJRH, Tulsa: <https://www.kjrh.com/news/local-news/osu-lab-processing-covid-19-tests>

Fox 25, Oklahoma City: <https://okcfox.com/news/local/partnership-between-two-osu-campus-allows-more-coronavirus-testing-kits-in-the-state>

Yahoo Finance: <https://finance.yahoo.com/news/innovative-partnership-creates-critically-needed-091700216.html>

Business Wire: <https://www.businesswire.com/news/home/20200407005390/en/Innovative-Partnership-Creates-Critically-Needed-COVID-19-Diagnostic>



Dr. Teluguakula Narasaraju (hood) and Dr. Yiwei Wang volunteered to help process COVID-19 samples. Dr. Narasaraju is a virologist studying Influenza and Corona viruses. Dr. Wang is a Chemist working on nanomaterials for use in cancer treatment.

McAlester News: https://www.mcalesternews.com/covid-19/covid-19-diagnostic-lab-at-osu-accelerating-testing-in-oklahoma/article_1502995c-7500-11ea-81c0-431d235b6823.html

Tulsa World: https://www.tulsaworld.com/news/local/osu-begins-covid-19-testing-relaxing-strict-restrictions-on-who-qualifies-for-a-test/article_e7e77385-3e8e-5822-a483-5ac0bf90cd9e.html

Ideas/Suggestions for Future Content

We want to hear from you.
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