



### 2020 Projects

Number of Projects Awarded: 30  
Amount of Funds Awarded: \$5,090,354

Funding Priorities: The 2020 NAHLN funding priorities targeted projects focused on test method development and validation, enhancing emergency preparedness, improving data management and providing exercises and drills that improve preparedness in laboratories.

Project Title	State	NAHLN Laboratory	Award Amount	Summary
Enhancing Emergency Preparedness at Three NAHLN Laboratories through professional BSL-3 Training	AL	Thompson Bishop Sparks State Diagnostic Laboratory	\$72,582	Plan to purchase an autoclave and send 12 people from 2 NAHLN labs to CA for BSL3 training. Having a high capacity autoclave located within the BSL-3 suite would enhance emergency preparedness by increasing biocontainment.
Enhance capacity for faster identification of bacterial foreign animal diseases at the Thompson Bishop Sparks State Diagnostic Laboratory	AL	Thompson Bishop Sparks State Diagnostic Laboratory	\$227,025	Plan to purchase Bruker MALDI Biotyper® sirius GP System.
An automated antibiotic sensitivity testing system for electronic data management and sharing the data with NAHLN	AL	Thompson Bishop Sparks State Diagnostic Laboratory	\$198,900	Plan to purchase fully automated Sensititre™ ARIS™ 2X system. We will complete equipment purchase, employee training, and equipment validation. To the end of the project, we will utilize the equipment to perform our routine AST on clinical and necropsy samples from avian, large and small production animals, and companion animals. We anticipate, this system will enhance our AST by faster sample processing, automated reading, and data generating. More importantly, it will allow us to analyze the stored data and observed the AMR trend over time. Finally, with electronic data management capability, we expect to participate in the NAHLN’s AMR project and share our AST data starting from 2022. TBSSDL is dedicated to serving in NAHLN activities and is very interested in participating in the AMR project.
Arizona Veterinary Diagnostic Laboratory NAHLN Enhancement (Priority 2) 2020 Cooperative Agreement Project Proposal, Farm Bill Section 12101	AZ	Arizona Veterinary Diagnostic Laboratory	\$180,512	Plan to purchase QuantStudio 5, Kingfisher, autoclave, and PAPRs. We are asking for funds to improve our capacity and biosecurity as a NAHLN testing facility. The pieces of equipment requested are long-term, durable items which will increase our ability to contribute to the NAHLN for many years.
Validation of Real-Time PCR (qPCR) assays for the OIE listed reportable and emerging crustacean disease pathogens	FL	Bronson Animal Disease Diagnostic Laboratory (BADDL)	\$229,527	The goal this project are to develop and validate a single- or multiplex PCR assay for eight OIE-reportable crustacean diseases required for import/export purposes, and then to develop a protocol for pooling samples. This does not address priorities for the 2020 Farm Bill, and seems to align more closely with FDA Vet LIRN priorities.

Enhancing Swine Diagnostics for the detection and differentiation of ASF and CSF from other economically significant septicemic diseases: Development of novel multiplex high throughput Taqman qPCR panels and point-of-care isothermal diagnostic platforms	GA	University of Georgia Tifton Veterinary Diagnostic Laboratory	\$176,861	Plan to purchase library automation system for short and long read sequencing and GridION for same day high throughput sequencing. There is an urgent need to develop rapid, low-cost and highly scalable assays to enhance capacity of NAHLN's laboratories to deal with outbreak of any emerging and foreign animal disease pathogens. The objective of proposed project is implementation of automated library preparation and sequencing tools for developing rapid, low-cost and highly scalable assays for early detection of emerging and FAD viruses.
Novel loop-mediated isothermal amplification (LAMP) systems as on-site diagnostic tools for classical swine fever and African swine fever viruses	IL	Veterinary Diagnostic Laboratory (VDL), University of Illinois	\$215,777	The current project is aimed to develop and perform analytical validation a novel diagnostic platform based on loop-mediated isothermal amplification (LAMP) assays for the accurate and rapid detection of ASF and CSF. Because the LAMP assay uses six separate gene regions for amplification, the specificity of this method is higher than other PCR-based techniques. These assays also have the potential to be developed for point-of-care testing, improving the NAHLN's disease detection capabilities.
Establishing messaging through newly acquired Orchard Sequoia LIMS	IN	Indiana Animal Disease Diagnostic Laboratory	\$10,450	As the Indiana ADDL moves to the implementation of a new LIMS system by Orchard Software, Inc., the existing messaging capabilities to the NAHLN will be lost. This grant proposal is intended to secure the funding to have the necessary interface development completed for messaging results to the NAHLN.
Development and validation of Point of Care (POC) assays for ASF and CSF for rapid outbreak response	KS	Kansas State Veterinary Diagnostic Laboratory	\$498,487	This project proposed to develop and validate both antigen- and serological based point of care tests for both ASF and CSF, using a lateral flow platform that, when used in the field, will simultaneously detect GPS coordinates of where the testing is taking place. The investigators then plan to validate the work using both experimentally infected animal samples and with field samples via international collaborations in the Ukraine, South Korea and Vietnam.
Kansas State Veterinary Diagnostic Laboratory (KSVDL) African Swine Fever Outbreak Collaborative Exercises Project	KS	Kansas State Veterinary Diagnostic Laboratory	\$76,115	In the event of a foreign animal disease outbreak, the number of tests performed by KSVDL is expected to sharply increase. To exercise the increased capacity this project proposes a multi-step exercise plan for the coming years which includes collaboration with university, state, and federal partners, as well as livestock producers and veterinarians within and around Kansas. This proposal would eventually culminate in a full-scale African Swine Fever exercise focused on the KSVDL response to an outbreak including surge testing of mock samples, operational logistics with emphasis on the accessioning and resulting process, and communication with NAHLN and the Foreign Animal Disease Diagnostic Laboratory (FADDL). An after-action report will be completed and utilized to address needed actions to improve and refine laboratory plans to assure readiness of KSVDL for an outbreak situation.
Point-of-care detection of ASFV, CSFV and FMDV using a single device for sample tracking, extraction, detection and remote data analysis and reporting	KS	Kansas State Veterinary Diagnostic Laboratory	\$128,900	This project proposes to develop and validate point-of-care molecular assays for detecting ASFV, CSFV and FMDV using a new field-deployable PCR system called the INT Palladium.

VirSlayer -a quick and easy to use bioinformatics pipeline for detection of endemic, emerging and foreign animal disease viruses	MN	University of Minnesota Veterinary Diagnostic Laboratory	\$100,507	The NAHLN identified the integration of NGS into the network as a top priority in 2018. One of the main gaps include not having sufficient personnel trained in bioinformatics and data interpretation. We will develop a novel bioinformatics pipeline to process metagenomic sequencing data that will combine machine learning and homology-based approaches to detect endemic, emerging and FAD viruses. Additionally, we will host a workshop to train participants on bioinformatics software and pipeline developed in this project.
Increasing NAHLN ASF response capacity in Minnesota	MN	University of Minnesota Veterinary Diagnostic Laboratory	\$228,374	Plan to purchase a liquid handler. Plan to purchase Quantstudio 5 thermal cycler, from Thermo Fisher. Currently, the VDL is able to test 279 samples (3 batches of 93 samples) in a 8-hour shift, without markedly affecting the regular testing volumes for diagnosis and surveillance of other diseases. After implementation of the changes described in this proposal, the VDL will be able to complete 756 samples (2 batches of 378 samples) in a 8-hour shift. This proposal aligns with priority 2 of the NAHLN 2020 Farm Bill request for proposals: enhancing emergency preparedness.
Agent Of Disease Point-Of-Care Genomics (AOD-POCgen): A Simplified Purpose-Built Platform And Improved Diagnostic Tool For Testing of Foreign Animal Diseases	MN	University of Minnesota Veterinary Diagnostic Laboratory	\$425,925	This project proposes to develop and validate a new point of care (POC) testing platform, called agent of disease POC genomics (AOD-POCgen), that could be used to detect and sequence foot-and-mouth disease and other vesicular viruses such as Senecavirus A (SVA) in the field.
Animal virome panel for optimization and validation of next generation sequencing for endemic, emerging and foreign animal disease viruses	MN	University of Minnesota Veterinary Diagnostic Laboratory	\$141,568	This project will develop standardize a testing panel and standards for optimizing and validating next-generation sequencing, targeting animal viruses.
Enhancing diagnostic and surveillance capabilities for early detection of emerging and foreign animal diseases using high throughput sequencing	MN	University of Minnesota Veterinary Diagnostic Laboratory	\$168,000	Plan to purchase library automation system for short and long read sequencing and GridION for same day high throughput sequencing. There is an urgent need to develop rapid, low-cost and highly scalable assays to enhance capacity of NAHLN's laboratories to deal with outbreak of any emerging and foreign animal disease pathogens. The objective of proposed project is implementation of automated library preparation and sequencing tools for developing rapid, low-cost and highly scalable assays for early detection of emerging and FAD viruses.
Development and validation of real-time quaking-induced (RT-QuIC) as confirmatory testing for chronic wasting disease CWD	MS	Mississippi Veterinary Research and Diagnostic Laboratory	\$141,433	This project proposes to evaluate the performance of a new technology (RT-QuIC) for diagnostic chronic wasting disease in live white-tailed deer, and to validate protocols for use on environmental samples. The project will first confirm the assay using tissues from dead animals, and compare to currently validated tests (ELISA and IHC).
Validation of ASR1 Peptoids-ELISA for the Detection of Chronic Wasting Disease Prion in Samples with Low Prion Burden	MO	University of Missouri Veterinary Medical Diagnostic Laboratory	\$116,323	The investigators propose to validate an ASR1 peptoids- ELISA method for the detection of low level chronic wasting disease (CWD) prions in samples from both live and dead animals. The intent is to provide a new diagnostic method that tests saliva samples, that has an improved sensitivity over the current ELISA test for detecting CWD. This method could also be used with environmental samples, which could be useful by regulatory officials for screening captive cervid farms.

NAHLN Messaging Audit Check	NC	Rollins Animal Disease Diagnostic Laboratory	\$55,000	Currently HL7 messages are hit or miss in the system based on data being entered. There is no way to know if the message will be transmitted effectively to the USDA. This new software enhancement for USALIMS will provide a process to audit the data that has been entered and will check to see if the message will successfully be transmitted. This will reduce errors when messaging test result to the NAHLN and make the entire process more efficient from the diagnostic laboratory to the USDA. By adding an HL7 audit process into USALIMS this will benefit all NAHLN labs who currently utilize USALIMS as their laboratory information management system.
Enhancing BSL-3 capabilities of Ohio Animal Disease Diagnostic Laboratory	OH	Ohio Animal Disease Diagnostic Laboratory	\$234,065	Plan to purchase 4 PAPRs, 2 refrigerators and 3 autoclaves to use for FAD samples. Also plan to send 2 people to BSL3 training.
Sample Processing Efficiency, Accuracy and Integration with CoreOne LIMs	OR	Oregon Veterinary Diagnostic Laboratory	\$89,610	Plan to purchase equipment for sample handling and identification with bar-coding then integrate equipment into CoreOne LIMs. Requesting slide printers, cytology stainer, barcode labels, printer, barcode scanner.
Validation of a high-throughput method for the detection of African Swine Fever virus	PA	Pennsylvania Veterinary Laboratory	\$55,000	The main objective is to incorporate a liquid handling system for high throughput detection of African Swine Fever virus and to cross-validate an additional Real-time PCR system for ASF testing. Lab capacity is estimated to increase from ~400 samples/day to ~800-1000 samples/day.
To increase real-time PCR testing capacity of foreign animal diseases at the Clemson Veterinary Diagnostic Center	SC	Clemson Veterinary Diagnostic Center	\$58,507	Plan to purchase Biosafety cabinet and real-time PCR system, Applied Biosystems QuantStudio 5 real-time PCR system, which comes with built-in VeriFlex zone and allows detection of more than one foreign animal disease simultaneously by optimizing annealing temperatures specific to various targets. Addition of a biosafety cabinet in our sample receiving area will shorten sample processing time.
Providing Laboratory Information Management System (LIMS) efficiencies for Foreign Animal Disease (FAD) outbreaks within multiple USDA National Animal Health Laboratory Network (NAHLN) Laboratories	SD	South Dakota State University	\$241,550	SD, MT and IL NAHLN Labs seek to improve our existing LIMS (VADDS) to facilitate more efficient and intuitive case submission, data entry, transmission of data to NAHLN, and data export and analysis for NAHLN scope diseases. Although our current system is functional, it lacks efficiency in certain areas of functionality, and it is our objective to improve these areas by developing new user interfaces and functions. This project will increase our efficiency, the accuracy of our laboratory data, and the ease with which we can share that data with NAHLN and other “need to know” entities during outbreak situations involving NAHLN scope diseases.
Completion of Scalable Field PCR Platform for Senecavirus A and Foot and Mouth Disease	TN	Kord Animal Health Diagnostic Laboratory	\$250,000	This project is a continuation of a partially funded 2019 Farm Bill proposal to develop a new PCR technology (adaptive RT-PCR) for field testing of SVA and FMD. Progress on the 2019 proposal includes ability to detect SVA from field samples (proof of concept testing), and to complete diagnostic limit of detection at ≤ 100 viral copies/reaction. Funding requested for 2020 is to produce and validate the PCR platform using FADI samples received by the TN. NAHLN laboratory through 2023. The projected cost of the field-deployable platform is \$2000, and cost per test is \$2.
Development of rapid and reliable next-generation sequencing and bioinformatics procedures for identification, pathotype prediction, and subtyping of influenza A viruses and optimization for use with clinical samples	TX	Texas A&M Veterinary Medical Diagnostic Laboratory	\$313,546	This project proposes to develop and validate a next-gen sequencing protocol for sequencing influenza A viruses from birds, and to develop a bioinformatics tool for analysis that can be used on a personal computer.

Enhancing Electronic Reporting and Data Transmission	VA	VA Tech Animal Laboratory Services	\$110,472	The ViTALS laboratory uses Orchard Harvest Software for Laboratory Information Management. Orchard Software offers complete laboratory system integration, decision-rule capability, configurable analytics, and case management. The LIMS was initially configured to primarily support the Veterinary Teaching Hospital at Virginia Tech, with a secondary mission of serving referring veterinarians and State agencies. ViTALS shares IT support with the VTH, and because the LIMS reporting is currently adequate for VTH needs, LIMS vendor support is required for improvements for NAHLN accessioning and messaging. This proposal is in response to the NAHLN priority Electronic Data Management, LIMS data access and electronic messaging support.
Enhancing Chronic Wasting Disease Testing Capability	VA	VA Tech Animal Laboratory Services	\$203,198	Plan to purchase ELISA and IHC materials (not IHC instrument). We propose to increase CWD testing capacity by standing up CWD ELISA and IHC testing in the serology and histology laboratories, identifying BSL2 space for sample preparation and testing, training staff in sample preparation, serology and immunohistochemistry, and result messaging to VDWR for rapid reporting. Plan to purchase Thermo Scientific KingFisher Flex. The objectives of this proposal include 1) Maintain disease surveillance testing capacity for high consequence, NAHLN-scope animal diseases. 2) Enhance outbreak testing capacity for high consequence, NAHLN-scope animal diseases. 3) Improve emergency preparedness and response capabilities. To demonstrate successful completion of the three objectives listed in Section 1, MAHDL will purchase and incorporate into the laboratory a Thermo Scientific KingFisher Flex to replace the BioSprint 96 between January 1, 2021 and December 31, 2021.
Moorefield Animal Health Diagnostic Laboratory- Enhancement of NAHLN Emergency Preparedness	WV	Moorefield Animal Health Diagnostic Laboratory	\$69,775	Despite the frequent need for testing with active surveillance for foreign animal diseases, the number of samples per day arriving at NAHLN laboratories for rapid turn-around testing is low. This project proposes to validate the KingFisher Duo Prime automated purification system as the low-throughput platform for routine, small-number surveillance testing or rapid FAD investigation of ASF, CSF and FMD rule out or look-alike disease confirmation. This will also improve efficiency and use of consumable reagents and supplies, which are in short supply due to COVID testing.
Validation of KingFisher Duo Prime for low-throughput nucleic acid extraction platform to enhance capacity for rapid NAHLN scope disease testing	WI	Wisconsin Veterinary Diagnostic Laboratory	\$72,366	