



### SCIENTISTS ON THE FOREFRONT

The Department of Homeland Security (DHS) Science and Technology Directorate's (S&T) Office of National Laboratories (ONL) operates the Plum Island Animal Disease Center (PIADC). At PIADC, DHS S&T and the Department of Agriculture's (USDA) Agriculture Research Service (ARS) and Animal Plant Inspection Service scientists study knowledge gaps and test, evaluate, and develop countermeasures and outbreak prevention and control measures for transboundary animal diseases, including African swine fever (ASF) and foot-and-mouth disease (FMD). PIADC is the only facility within the U.S. that is permitted to utilize live FMD virus as part of its scientific activities.

The DHS PIADC Science Program conducts pivotal scientific studies that support the transition of diagnostic tests and platforms—initially developed by industry sponsors—through the USDA Center for Veterinary Biologics' regulatory approval process for product licensure. Achieving product licensure enables DHS to provide usable tools to first responders, DHS components and the USDA National Animal Vaccine and Veterinary Countermeasures Bank.

### DHS PIADC SCIENCE PROGRAM IMPACT

Since 2005, the DHS PIADC Science Program—comprised of federal and contractor scientific staff—has executed a broad portfolio of Food, Agriculture, and Veterinary Defense (FAV-D) projects related to preventing, protecting against, mitigating, responding to, and recovering from the intentional, natural, or accidental introduction of trade-restricting transboundary animal diseases to the U.S. Scientists supporting the science program execute research, development, test, and evaluation efforts on FAV-D projects, primarily involving ASF virus (ASFV) and FMD virus (FMDV).

In a suspected outbreak, the ability to rapidly detect and presumptively identify a transboundary animal disease pathogen is critical to mitigating economic impact and is also essential during the outbreak recovery phase. Currently, all livestock diagnostic tests used in the U.S. are federal or state lab based. The ability of qualified veterinarian, state, or federal animal health officials to use field deployable (pen-side), rapid, easy-to-use diagnostic devices—that can securely communicate results to a centralized reporting system—can save time, allow for faster decision-making, and reduce economic losses.

Given that a transboundary animal disease outbreak could result in billions of dollars in direct/indirect losses and significant societal disruption, countries such as the U.S. are interested in increasing preparedness, response, and recovery capabilities.



*A PIADC scientist conducts research on African swine fever*

### DIAGNOSTIC DEVELOPMENT EFFORTS

From fiscal year (FY) 2018–present, DHS S&T has invested more than \$2.5M to test and evaluate diagnostic devices for transboundary animal diseases, including:

#### **ASFV Field Detection Device:**

FY 2019–2021. Under a cooperative research and development agreement, the PIADC Science Program tested and published results ([Trans. Bound Dis. 2021](#)) on MatMaCorp's rapid, portable diagnostic device, which demonstrated utility for field investigations.

#### **FMDV Lateral Flow Assay:**

FY 2019–2022. Under a contract award, the PIADC Science Program worked with Silver Lake Research to evaluate an easy-to-use, rapid test strip to differentiate FMDV from similar swine viruses.

#### **ASFV Rapid Detection Single-Use, Disposable, Pen-Side Test:**

FY 2019–present. Under a contract award, the PIADC Science Program is working with Gate Scientific to develop an easy-to-use, rapid, molecular-based, disposable test with secure IT communication capability. Final prototype identification through PIADC is ongoing, and if successful, regulatory requirements will then need to be satisfactorily met for USDA product licensure.

