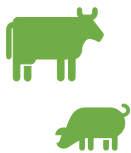


BACKGROUND

The Department of Homeland Security (DHS) Science and Technology Directorate (S&T)'s Plum Island Animal Disease Center (PIADC) became part of DHS in 2003. PIADC has been protecting the nation's agriculture against the accidental or intentional introduction of **transboundary animal diseases (TAD)**, including foot-and-mouth disease (FMD) and African Swine Fever (ASF), for over 65 years. PIADC is the only federal laboratory in the nation that can conduct diagnostics and research with live FMD virus (FMDV) and live ASF virus (ASFV).

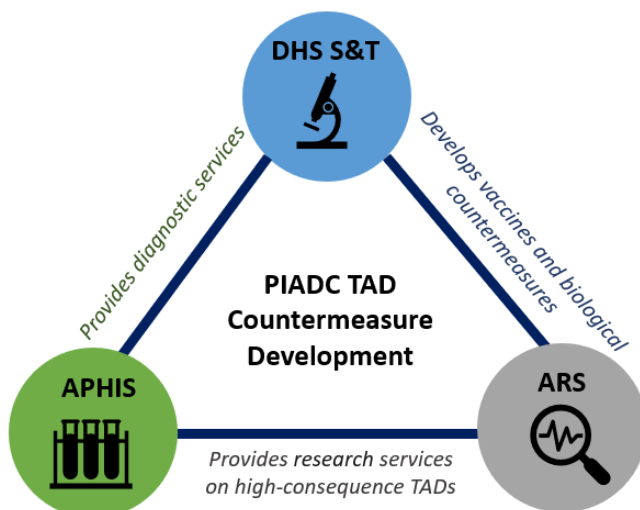
To execute its agricultural defense mission, PIADC is a partnership between DHS S&T, the United States Department of Agriculture (USDA) Agricultural Research Service (ARS), and the USDA Plant and Animal Health Inspection Services (APHIS).

MISSION



- **Defend the nation against foreign animal diseases that could result in food insecurity and export markets for livestock, and other animal products.**

- DHS S&T conducts targeted advanced development for diagnostics and vaccines for high-threat foreign animal diseases.



EXPERTISE

PIADC requires dedicated resources to maintain modern capabilities for countermeasure development to support the DHS agriculture defense mission. PIADC's DHS S&T scientific subject matter experts (SMEs) serve the broader homeland security enterprise by:

- Performing **advanced development of vaccines** and other biological countermeasures to TADs
- **Co-leading the PIADC ASF Task Force**
- **Developing TAD vaccines** in partnership with veterinary biologics companies for product licensure and manufacturing
- **Establishing cooperative research and development agreements (CRADAs)** with global animal health biopharmaceuticals, animal agricultures, and global animal genomics companies
- **Obtaining United States Patent and Trademark Office (USPTO) patents** related to TAD novel vaccines, methods of production and use
- **Publishing peer-reviewed scientific papers**

IMPACT

Since 1956, PIADC has defended the nation against foreign animal diseases like FMD and ASF that cause food insecurity and terminate export markets for animal products. While the United States has been FMD-free for almost 100 years, the cost of an outbreak could exceed \$50 billion in only one year. ASF has recently spread from Africa to over 50 countries. China, which has 500 million pigs (half the world's population), has lost over 50% of their pork population to ASFV since 2018, leading to a nearly 10% reduction in global food protein supply. The United States is the largest exporter of pork worldwide and we export one-third of our pork. ASF would result in the total loss of our export market.

OBTAINING UNITED STATES PATENTS RELATED TO TAD VACCINES

PIADC development, research and inventions have resulted in multiple patents granted by the USPTO that provide for the security of our nation's food supply. In 2018 alone, PIADC received six USPTO granted patents and had several pending patents.

CUSTOMERS:

- United States Livestock Producers
- National Veterinary Stockpile
- National Animal Health Laboratory Network

PARTNERS:

- Technology Transfer
- Office of General Counsel
- Animal Health Industry



CASE STUDY:

The World Intellectual Property Organization published a patent application titled "Modified Picornavirus 3C Proteases and Methods Thereof" to PIADC inventors in 2019. FMD is one of the most economically devastating livestock diseases on the planet. The technology PIADC invented supports the efficient development and manufacturing of vaccines against novel emerging FMD serotypes. The invention focuses on a new process for making molecular-based vaccines. Other scientists may be able to create animal and human vaccines in a fraction of the time it takes now by following this blueprint.

SECURING INDUSTRY PARTNERSHIPS THROUGH CRADAS

PIADC has established CRADAs with industry partners for FMD vaccine development and ASF research. In 2019, PIADC fulfilled a CRADA with the National Pork Board to evaluate commercial disinfectants for use against ASF and in 2020,

entered into a CRADA with MatMaCorp for evaluation of a field-deployable ASF test.

CUSTOMERS:

- Livestock Producers
- Veterinary Health Professionals

PARTNERS:

- Global Animal Health Companies
- Animal Agriculture Companies
- National Pork Board



CASE STUDY:

In 2019, PIADC and MatMaCorp completed a successful evaluation of a field-deployable genetic test to detect ASFV in infected pigs and pork products. PIADC and MatMaCorp collected clinical tissue samples from infected laboratory pigs and using MatMaCorp's gene detection tools, were able to successfully detect ASFV in all samples. As ASF continues to rapidly spread in other parts of the world, this field-deployable technology can help in outbreak response to the threat posed by accidental or intentional introduction of ASF in the United States.

ESTABLISHED ASF TASK FORCE

In response to ASF's increasing global threat, PIADC established an interagency ASF Task Force, whose goals are:

- Fast-track development and scaled-up production of an emergency-use ASF vaccine
- Improve diagnostic test surge capacity to support national surveillance and outbreak response
- Evaluate commercially available disinfectants to determine their efficacy to decontaminate ASF virus-contaminated spaces to support outbreak response capabilities and disinfection efforts