

## Veterinary Diagnostic Researchers Continuing Research on Swine Influenzas and Circoviruses

**Swine disease research at Kansas State University is now getting closer to developing new, reliable diagnostic tests for several swine disease viruses that occur across the globe. Two new research grants worth \$173,400 from the Swine Health Information Center in Ames, Iowa, in 2018 will help continue research that began in 2016.**

**"With the two Swine Health Information Center grants funded in 2016, we are in the final stage of building real-time polymerase chain reaction, or PCR, assays for swine influenza B, C and D and porcine circovirus 3, or PCV3," said [Jianfa Bai](#), an associate professor and director of molecular research and development for the [Kansas State Veterinary Diagnostic Laboratory](#). "These current grants will be a logical continuation of the 2016 grants. With the 2016 grants, we are building PCR assays for pathogen detections, and current grants will support the development of antibody detection assays to monitor animal responses to these viruses."**

**Bai said a PCR assay detects the presence of viruses and the antibody assays tell if an animal's immune system is responding to viral infections. The challenging part of this research stems from the different variations of swine influenza and circoviruses.**

**"Swine influenza is a highly contagious viral respiratory disease caused by influenza A, B, C and D viruses," said [Xuming Liu](#), an assistant professor in molecular diagnostics at the diagnostic laboratory. "Influenza A virus is the most common pathogen and previously was assumed to be the only influenza virus that could infect swine. Recent evidence has demonstrated that influenza B and influenza C also have the potential to infect swine. As for influenza D virus, since its discovery in swine in 2011 in the U.S., the virus has been reported in Italy, China, Mexico, France and Japan."**

**Liu said that a swine blood survey indicated an increase in the existence and prevalence of influenza D virus in Italian pig populations, rising to 11.7 percent in 2015 compared to a prevalence rate of only 0.6 percent in 2009. Molecular tests had revealed influenza D virus also widely circulates in southern China's Guangdong Province, where up to 37 percent of surveyed pigs that exhibited flu-like symptoms were found to have influenza D virus in lung and nasal swab samples.**

**"The timely diagnosis of infections from influenza viruses is extremely important**

**for prevention and intervention," Bai said. "With the Swine Information Health Center's support, our research on a multiplex real-time reverse transcription PCR assay for the simultaneous detection and differentiation of swine influenza B, C, and D viruses and PCV3 and porcine circovirus 2, or PCV2, viruses is now under development in our laboratory."**

**Bai said that enzyme-linked immunosorbent assays, initially developed in the 1970s, are still considered the gold standard for antibody detection when monitoring animal responses to emerging infectious diseases.**

**"Our proposed study will develop and validate antibody-based detection assays using the enzyme-linked immunosorbent assay platform for sensitive and high-throughput detection of swine antibodies in both serum and oral fluid samples in response to influenza B, C and D, and PCV3 infections," Bai said.**

**"As a diagnostic lab, we place high value on this type of research because it helps us to be more capable to respond to emerging diseases if and when they occur," said Jamie Henningson, interim director of the Kansas State Diagnostic Laboratory. "We are very pleased the Swine Health Information Center continues to recognize, appreciate and continue to support Dr. Bai's research. Ultimately it will improve the health and welfare of swine, and further help to ensure a safe and healthy food supply."**

**The two grant projects funded by the Swine Health Information Center are "Development of antibody detection assays for swine influenza B, C and D viruses " and "Development and evaluation of antibody detection assay for PCV3 virus." Co-principal investigators are Kansas State University's Ying Fang, Wenjun Ma, Lalitha Peddireddi, Yanhua Li and Gary Anderson, as well as Megan Potter of the Abilene Animal Hospital, Abilene.**