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Double Trouble for Influenza Viruses

Test available for new canine influenza strain at KSVDL



Dr. Susan Nelson from the Pet Health Center and Dr. Ben Hause from the Kansas State Veterinary Diagnostic Lab address the new H3N2 strain of canine influenza virus. No vaccine is available yet.

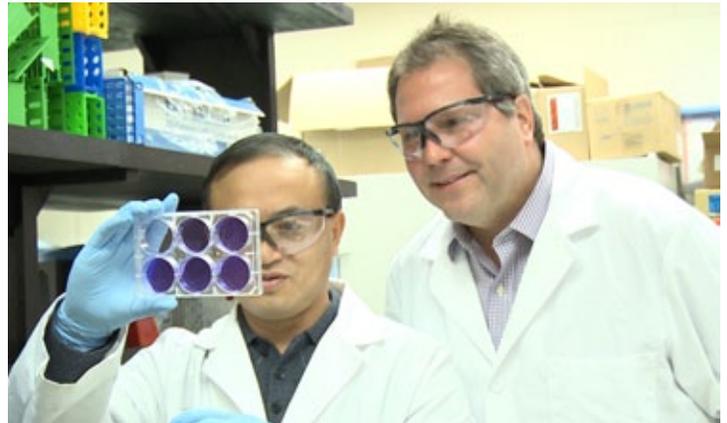
Veterinarians can now test for the new strain of canine influenza that sickened thousands of dogs in the Midwest and is still popping up across the country. The test is available at the Kansas State Veterinary Diagnostic Laboratory.

Since late April, more than 1,000 dogs had been infected — and some have died — from an H3N2 strain of canine influenza new to the U.S. that originated in Asia. Veterinarians at Kansas State University say they are now able to differentiate this strain from the other strain prevalent in the United States, H3N8.

“We can perform hemagglutinin and neuraminidase gene sequencing — the H and N portions of the strain — on a

See CANINE INFLUENZA, page 3

New vaccines for H5N1, H7N9 avian influenza strains



Drs. Wenjun Ma and Jürgen Richt, from the Center of Excellence for Emerging and Zoonotic Animal Diseases, have developed vaccines for H5N1 and H7N9, two strains of avian influenza.

A recent study with Kansas State University researchers details vaccine development for two new strains of avian influenza found in other countries that can be transmitted from poultry to humans. Those strains, not found in the U.S., have led to the culling of millions of commercial chickens and turkeys as well as the death of hundreds of people.

The new vaccine development method is expected to help researchers make vaccines for emerging strains of avian influenza more quickly. This could reduce the number and intensity of large-scale outbreaks at poultry farms as well as curb human transmission.

See AVIAN INFLUENZA, page 3

Inside this issue of *lifelines*



**CORE obtains
USDA grant.**

See page 2



**CEVBD receives gift
of lab space.**

See page 2



**Showcasing our
resources.**

See page 4

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College of Veterinary Medicine

More stories + video reports online at:
www.vet.k-state.edu/development/lifelines/1506.html

Center for Outcomes Research and Education receives USDA grant to study risk management strategies to reduce impact of bovine respiratory disease complex

Dr. David Renter, director of the new Center for Outcomes Research and Education (CORE) has announced the receipt of a \$489,466 grant to study health and economic risk management strategies to reduce the impacts of bovine respiratory disease complex in commercial feeder cattle.

“This is a really significant initiative at the CORE,” said Dr. Renter. “This is a four-year project which involves several truly exceptional faculty: Dr. Mike Sanderson and Dr. Natalia Cernicchiaro in our department, plus Dr. Robert Larson and Dr. Brad White in the Clinical Sciences department, and outside of the college, Dr. Ted C Schroeder in Agricultural Economics and Dr. Nora Bello in the Department of Statistics.”

He said the grant is classified as an Agriculture and Food Research Initiative Competitive Grant from the USDA’s National Institute of Food and Agriculture, which provides funding for fundamental and applied research, education, and extension to address food and agricultural sciences.

“Bovine respiratory disease complex is the most common cause of sickness and death in U.S. feeder cattle,” Dr. Renter said. “Every year, it costs the U.S. beef industry an estimated

\$4 billion and negatively affects the well-being of millions of animals. Our long-term goal is to reduce the health and economic impacts of bovine respiratory disease complex by utilizing scientific and industry knowledge to improve disease management.”

To reach this goal, Dr. Renter said there is clearly a need to concurrently develop health and economic risk management strategies that combine the best science with data from commercial beef cattle production systems.

“Our research goal is to develop strategies that differentiate bovine respiratory disease complex risks among diverse feeder cattle populations and identify sustainable approaches to reducing BRDC in these animal populations,” he said. “We will achieve this goal through three interrelated research approaches. We also will collaborate with cattle producers and veterinarians to generate more detailed information on how feeder calves were managed prior to feedlot purchase by studying groups of feeder cattle in different segments of the beef industry.”

Alumnus Dr. Kelly Lechtenberg gives use of BSL-2 laboratory space to the Center of Excellence for Vector-Borne Diseases

Dr. Kelly Lechtenberg, Oakland, Nebraska, CEO of Midwest Veterinary Services and Central States Research Centre of Oakland, has provided a sustaining annual gift of biosecurity-level-2 laboratory space for use by the new Center of Excellence for Vector-Borne Diseases (CEVBD) in the College of Veterinary Medicine at Kansas State University. The CEVBD is an interdisciplinary research center with a mission to combat vector-borne diseases with a focus on pathogenesis, surveillance and disease prevention.

“Dr. Lechtenberg is a wonderful person who is making a big difference in supporting the center,” said Dr. Ganta, professor and director of the center. “We will use this facility to maintain a sustainable K-State Tick Rearing Facility which is part of the new center. This facility is already in progress and its goals include supporting the K-State faculty research focused on ticks and in addition, it will serve as a one of a kind resource for tick researchers at other academic institutions and industry.”

“We are pleased to assist Dr. Ganta and his team to continue their very important work with vector-borne diseases,” said Dr. Lechtenberg, who graduated from K-State with a DVM in 1987 and a Ph.D. in ruminant nutrition in 1988. “Roman and the rest of the CEVBD team are passionate about their work and have an ‘urgency of mission’ that makes this project bound for success. I am confident that we will see this team contribute

greatly to our knowledge of disease transmission and be instrumental in developing interventions that make outdoor life safer for people, their pets and the livestock entrusted to their care.”

“Dr. Lechtenberg has a long history of generously supporting programs and facilities in the college,” said Dr. Ralph Richardson, dean of the Kansas State University College of Veterinary Medicine.

The center is active in developing a network to build research programs focused on tick and other vector-borne diseases of importance to human and animal diseases, including foreign animal diseases, to promote strong collaborations among K-State faculty who have shared interests, as well as faculty and researchers at other academic institutions and industry in the U.S. and abroad.



Dr. Kelly Lechtenberg, DVM class of 1987, congratulates Dr. Roman Ganta at the dedication of the CEVBD in April.

Canine Influenza | KSVDL offers test

continued from page 1

sample that is positive for canine influenza,” said Dr. Ben Hause, research assistant professor of diagnostic medicine and pathobiology. “This gene sequencing will allow us to compare how close of a genetic match the virus in the sample is to other canine influenza isolates and provide important epidemiological information, allowing us to track how the virus is evolving in dogs.”

Dr. Hause said this information is relevant for vaccine design and determining if the virus is mutating.

While veterinarians can now determine which strain may be sickening dogs, there is currently no vaccine for this new strain.

“It is still unknown if the vaccine for the H3N8 strain of canine influenza offers cross-protection for this new strain of influenza,” said Dr. Susan Nelson, clinical associate professor in clinical sciences at the Veterinary Health Center. “The main thing is to be vigilant about where you’re taking your dog and watch for signs of illness. This is a disease we’re going to see most often in places where there are groups of dogs, such as doggie day cares, dog parks and boarding facilities. Unlike human influenza, canine influenza is not a seasonal disease and can be contracted at any time of the year.”

Almost all dogs exposed to the virus will become infected, but only about 80 percent of those dogs will show signs. Symptoms include coughing, fever, yellowish-green colored nasal discharge, dehydration and lethargy. The other 20 percent will show no signs of sickness, but will still be contagious, said Dr. Nelson.

Dogs typically show signs of the disease two to four days after exposure. This incubation period between exposure and when symptoms develop is when dogs are the most contagious to other dogs. Dogs can shed the virus for up to seven to 10 days after exposure and continue to be contagious during this time.

“The vast majority of dogs have a mild form of the disease that lasts for about two to three weeks,” Dr. Nelson said. “They will get better with just supportive care. About 10 percent of these dogs can develop pneumonia, which can be fatal. My advice to dog owners is to watch the news and be aware of where the disease is across the country.”

There currently have been no cases of in Kansas.

Avian Influenza | CEEZAD develops vaccines

continued from page 1

It also may lead to new influenza vaccines for pigs, and novel vaccines for sheep and other livestock, said Dr. Jürgen Richt, Regents distinguished professor of veterinary medicine and director of the U.S. Department of Homeland Security’s Center of Excellence for Emerging and Zoonotic Animal Diseases.

Dr. Richt and his colleagues focused on the avian influenza virus subtype H5N1, a new strain most active in Indonesia, Egypt and other Southeast Asian and North African countries.

H5N1 also has been documented in wild birds in the U.S., though in fewer numbers.

“H5N1 is a zoonotic pathogen, which means that it is transmitted from chickens to humans,” Dr. Richt said. “So far it has infected more than 700 people worldwide and has killed about 60 percent of them. Unfortunately, it has a pretty high mortality rate.”

Researchers developed a vaccine for H5N1 by combining two viruses. A vaccine strain of the Newcastle disease virus, a virus that naturally affects poultry, was cloned and a small section of the H5N1 virus was transplanted into the Newcastle disease virus vaccine, creating a recombinant virus.

Tests showed that the new recombinant virus vaccinated chickens against both Newcastle disease virus and H5N1.

Researchers also looked at the avian flu subtype H7N9, an emerging zoonotic strain that has been circulating in China since 2013. China has reported about 650 cases in humans and Canada has reported two cases in people returning from China. About 230 people have died from H7N9.

“In Southeast Asia there are a lot of markets that sell live birds that people can buy and prepare at home,” Dr. Richt said. “In contrast to the H5N1 virus that kills the majority of chickens in three to five days, chickens infected with the H7N9 virus do not show clinical signs of sickness. That means you could buy a bird that looks perfectly healthy but could be infected. If an infected bird is prepared for consumption, there is a high chance you could get sick, and about 1 in 3 infected people die.”

Using the same method for developing the H5N1 vaccine, researchers inserted a small section of the H7N9 virus into the Newcastle disease virus vaccine. Chickens given this recombinant vaccine were protected against the Newcastle disease virus and H7N9.

“We believe this Newcastle disease virus concept works very well for poultry because you kill two birds with one stone, metaphorically speaking,” Dr. Richt said. “You use only one vector to vaccinate and protect against a selected virus strain of avian influenza.”

Using the Newcastle disease virus for vaccine development may extend beyond poultry to pigs, cattle and sheep, Richt said.

Researchers found they were able to protect pigs against an H3 influenza strain by using the Newcastle disease virus to develop a recombinant virus vaccine. Dr. Wenjun Ma, assistant professor of diagnostic medicine and pathobiology, is building on this finding and using the Newcastle disease virus to make a vaccine for porcine epidemic diarrhea virus, a disease that has killed an estimated 6 million pigs.

Dr. Richt conducted the avian influenza study with Dr. Ma, Dr. Adolfo Garcia-Sastre at the Icahn School of Medicine at Mount Sinai in New York, and several other colleagues. They published their findings in the *Journal of Virology* study, “Newcastle disease virus-vectored H7 and H5 live vaccines protect chickens from challenge with H7N9 or H5N1 avian influenza viruses.” It is the first study to look at an H7N9 vaccine in chickens, the animals the disease originates in.

Excellent award for a new doctor



Bayer HealthCare LLC Animal Health recently announced that Dr. Anna Champagne, Wichita, Kansas, a 2015 DVM graduate, was the Kansas State University recipient of a Bayer Excellence in Communication Award (BECA). Twenty-seven veterinary schools participated in the 2015 competition that presented a total of \$70,000 in scholarship awards. "I am very humbled to receive the Bayer Excellence in Communication Award," Dr. Champagne said, pictured with CVM Executive Associate Dean Dr. Roger Fingland at the annual honors banquet. "Educating clients about their pet's health is my favorite part about veterinary medicine."

Resourceful to the Core



Several CVM units held booths at the Research Facilities and Resource Showcase at the K-State Student Union. From left: Joel Sanneman, Dr. Philine Wangemann, Dr. Dan Marcus and Don Harbridge from the Confocal Microscopy Core and Molecular Biology Core.

CVM News Ticker

Dr. Sasha Thomason received the Pet Tribute Faculty Award. This award is presented to a faculty member who demonstrates excellence in compassion, sensitivity, and empathy while caring for patients. The award is determined by a vote of the senior class.

Dr. Steve Dritz presented about the "Impact of health on feed efficiency in swine" and **Dr. Márcio Gonçalves** presented about the "Impact of sow nutrition on piglet birth weight" at the International Symposium of Swine Health, Production, and Reproduction in Porto Alegre, Brazil. This symposium is organized by one of the top veterinary schools in Brazil named Federal University of Rio Grande do Sul. About 850 people attended.

Dr. Pradeep Malreddy became the newest Wakonse Fellow by participating in the Wakonse Conference on College Teaching held May 21-26, 2015, in Shelby, Michigan, at Camp Miniwanca. Kansas State University has sent more than 60 faculty members to Wakonse since 2002. Their attendance is supported by the Office of the Provost, the Teaching & Learning Center, and endorsed by the Faculty Exchange for Teaching Excellence. More information about Wakonse can be found at: www.wakonse.org

LIFELINES VIDEO FEATURE

K-State Mobile Surgery Unit goes 'On Location'
www.YouTube.com/watch?v=HoCeTMZiBRc



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