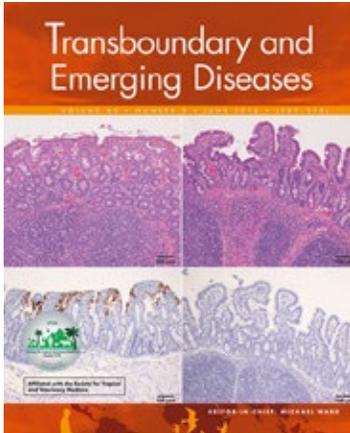




CVM swine research on journal cover

By Sofia Scavone



An image from the new review article has been featured on the cover of the latest issue of the international journal *Transboundary and Emerging Diseases*: “Swine enteric coronavirus disease: A review of four years with porcine epidemic diarrhoea virus and porcine deltacoronavirus in the United States and Canada.”

In their article, Dr. Megan Niederwerder, assistant professor in DMP, and Dr. Dick Hesse, professor and director of diagnostic virology, review the recent introduction and spread of porcine epidemic diarrhea virus (PEDV) and porcine deltacoronavirus (PDCoV) in the United States and Canada.

Although these two viruses were recently introduced in 2013 and 2014, respectively, both viruses are now endemic in US swine herds. The authors review current/historical research on the viruses, including clinical disease in different age groups, post-infection viral shedding, the long-term impact of disease on growth and production, introduction and transmission risks, and herd management strategies.

“These two viruses have caused and continue to cause significant economic and production losses within the U.S. swine industry. Within the first year after PEDV was introduced, approximately 10 percent of the U.S. herd died due to the disease, primarily affecting very young piglets within a few days of age,” Dr. Niederwerder explained.

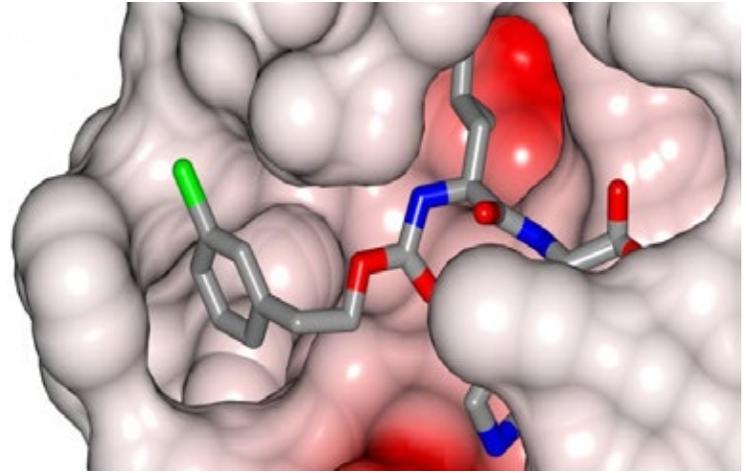
New \$3.7 million NIH grant supports research against MERS coronavirus

A relatively new virus has commanded the attention of a team of multi-institutional researchers and prompted a \$3.7 million for five-year research project.

“Since the unexpected emergence of Middle East Respiratory Syndrome coronavirus (MERS-CoV) in 2013, the ongoing outbreaks of MERS in the Middle East and the potential for global transmission of MERS have underscored the urgent need for effective preventive and therapeutic measures against this highly virulent coronavirus,” said Dr. Kyeong-Ok “KC” Chang, a virologist at the Kansas State University College of Veterinary Medicine.

Dr. Chang is collaborating with multiple scientists from various disciplines: Dr. Yunjeong Kim, a virologist from Kansas State University; Dr. William C. Groutas, a medicinal chemist at Wichita State University; Dr. Stanley Perlman, a virologist at the University of Iowa; and Dr. Scott Lovell, a structural biologist at the University of Kansas.

The title of their grant is, “Small Molecule Protease



Co-crystallization of Middle East Respiratory Syndrome coronavirus (MERS-CoV) 3C-like protease and one of the effective compounds.

Inhibitors against Middle East Respiratory Syndrome coronavirus.” The grant is provided under the category of R01 funding by the National Institutes of Health’s National Institute of Allergy and Infectious Diseases.

Coronaviruses are part of a group of RNA viruses that look like a corona or halo when viewed under the electron microscope. Directly acting inhibitors such as polymerase inhibitors and protease inhibitors have been successfully developed and available to the public against some of important

viral infections like the human immunodeficiency virus and hepatitis C virus. But there is no specific antiviral available for MERS-CoV yet.

Drs. Kim, Chang and Groutas have been working on protease inhibitors for a fatal feline coronavirus infection, called feline infectious peritonitis (FIP) and have recently shown the efficacy of their inhibitor in the treatment of FIP in feline patients, showing the promising potential for their approach for the development of antiviral drug for coronavirus infection.

BRI leads first U.S. livestock study on Japanese encephalitis virus

By Gabriella Doebele

In what is believed to be the first study of its kind in the United States, Kansas State University College of Veterinary Medicine researchers found that North American domestic pigs are potentially susceptible to infections with the Japanese encephalitis virus (JEV).

“Japanese encephalitis virus is a mosquito-transmitted flavivirus that has high human and veterinary public health significance,” said So Lee Park, a third-year veterinary student and concurrent Ph.D. student, who was the first author on this research article.

“Collectively, our study demonstrates for the first time that North American domestic pigs can contribute to the JEV transmission cycle as amplifying hosts.”

Support for the research was provided in part through a State of Kansas National Bio and Agro-defense Facility (NBAF) transition grant since this mosquito-borne flavivirus is an NBAF priority pathogen. The research was conducted at K-State’s Biosecurity Research Institute (BRI).



Dr. Dana Vanlandingham mentors So Lee Park, a concurrent DVM/Ph.D. student.

“In this study, domestic pigs from North America were intravenously challenged with JEV to characterize the pathological outcomes,” said Dr. Dana Vanlandingham, associate professor in DMP and corresponding author.

Students join BCI for industry education



A group of VTPRK students visit Cattle Empire LLC in Satanta.

Beginning May 14, 10 incoming first- and second-year veterinary students joined the Beef Cattle Institute (BCI) at Kansas State University for two weeks of beef industry-related tours, presentations and hands-on demonstrations.

Students Braxton Butler, Izabella Carmona, Lena Fernkopf, Jared Heiman, Ashley Joseph, Megan Westerhold, Meredith Schmidt, Matthew Kelso, Libby Farney and Shanlyn Hefley are part of the Veterinary Training Program for Rural Kansas (VTPRK), a state-funded effort provided through the College of Veterinary Medicine to return veterinary graduates to rural Kansas to serve counties of fewer than 35,000 residents.

The program provides up to \$20,000 per year toward academic and professional

development to each of five students per class over the course of four years. Graduates of the VTPRK program are required to practice veterinary medicine in a qualifying county for four years following graduation.

During the first week, the students, BCI Director Dr. Brad White and Kelly Oliver, program coordinator, toured a number of beef industry businesses across western Kansas. Starting at National Beef in Dodge City, the group moved to Forget-Me-Not Farms dairy in Cimarron, Cattle Empire in Satanta, Hy-Plains Feedyard in Montezuma, and finished up at Gardiner Angus Ranch and Ashland Veterinary Clinic in Ashland.

“The goal of hosting these students is to prepare our VTPRK students for success in rural practice,” Dr. White said.

Formaldehyde has negative impact on swine growth performance and gut microbiota

By Gabriella Doebele

The use of formaldehyde as an additive to control and reduce bacterial contamination in animal feed has raised eyebrows of applied swine nutritionists and veterinary researchers at K-State. A new study has revealed complications that come with this dietary treatment.

“The feed additive formaldehyde can be included in animal feed or ingredients to maintain complete feed and ingredients as Salmonella negative for up to 21 days in accordance with FDA regulations,” said Dr. Raghavendra Amachawadi, assistant professor in the Department of Clinical Sciences.

More recently the use of the additive has increased in swine diets since research has demonstrated that treatment of the feed with formaldehyde inactivates Porcine Epidemic Diarrhea Virus.

“However, we hypothesized that the use of formaldehyde in swine diets may influence gut microbial composition due to its antimicrobial properties, which might negatively influence microbial populations and pig growth performance,” said Dr. Amachawadi, who worked with Dr. Steve Dritz, DMP professor and swine specialist “The use of in-feed antibiotics has led to concern about antibiotic resistance in gut bacteria and their influence on gut microbiota. Likewise, information is lacking regarding formaldehyde inclusion in the diet of pigs.”

This study was the first to report the effects of formaldehyde treatment of diets on pig gut microbiota. While treating the complete diet did reduce the microbial content of the feed as expected, treating the diets also led to reduced growth performance.

Chinese DVM alumni publish first clinical case report of HERDA in China

A pair of recent graduates of Kansas State University’s US-China Joint Doctor of Veterinary Medicine (DVM) Program have just made a unique discovery less than a year after returning to China. Dr. Jing Li and Dr. Bo Liu, who both earned their DVM degrees in 2017, have already published a research article outlining the discovery of a

unique equine case report in the Journal of Equine Veterinary Science.

“Hereditary equine regional dermal asthenia (HERDA) is a heritable disorder that has been described in quarter horses and related breeds,” Dr. Li said.



Dr. Jing Li, right, works with horses at China Agricultural University.

CVM News Ticker



Congratulations to the class of 2018. Above, Dr. Austin Pauly is being hooded by his two brothers, Dr. Brandon Pauly, DVM class of 2005, and Dr. Craig Pauly, DVM class of 2011. Commencement was held May 11 at McCain Auditorium.

For the month of May, Drs. Amy Rankin and Jessica Meekins participated in the ACVO Annual National Service Animal Eye Exam event by providing free eye exams.

Dr. Shaun Huser and veterinary students Amanda Sura, Katherine Norris and Emily White had the opportunity to travel to Dr. Kathy Ewert’s ranch, Notkwita, to help perform laparoscopic A.I. in sheep on May 15.

On May 16, Drs. Kate KuKanich and Brian Lubbers presented to the Presidential Advisory Committee on Combating Antibiotic Resistant Bacteria in Washington, D.C. Dr. Mike Apley served as chair for the session.

Dr. David Eshar has been named the new Exotic Companion Mammal Regent for the ABVP effective July 1.

Dr. Susan Moore presented her research, titled “Antibody levels in different groups of pets following vaccination,” at the 2018 James Steele Conference on Diseases in Nature Transmissible to Man in Houston, Texas, on May 24. Co-authors in the study are Sami Pralle and Elizabeth McQuade.

lifelines is published monthly by Marketing and Communications in the College of Veterinary Medicine, edited by Joe Montgomery, jmontgom@vet.k-state.edu. More stories at: www.vet.k-state.edu/lifelines/1806.html

Connect with us!

facebook.com/ksucvm

youtube.com/ksucvm

twitter.com/ksucvm

