lifelines
News from the College of Veterinary Medicine at Kansas State University
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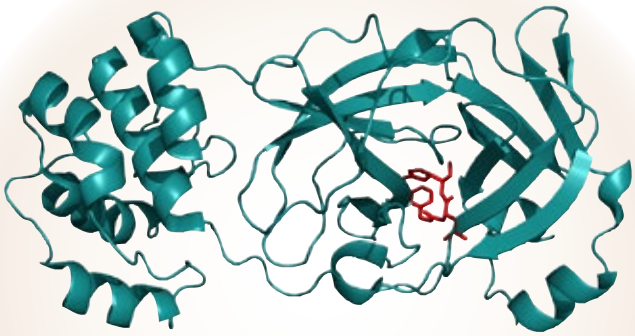
Dr. Yunjeong Kim helps pave the way to identify antiviral treatment for deadly infectious cat diseases - FIP & MERS

A new research project in the College of Veterinary Medicine at Kansas State University has been successful in treating a deadly cat disease that has previously been nearly 100 percent fatal. Dr. Yunjeong Kim, an associate professor in the Department of Diagnostic Medicine/Pathobiology, has worked with collaborators in diverse fields to develop an antiviral compound for feline coronavirus associated with feline infectious peritonitis, more commonly known as FIP.

Her article, "Reversal of the Progression of Fatal Coronavirus Infection in Cats by a Broad-Spectrum Coronavirus Protease Inhibitor" has just been published in the journal PLOS Pathogens. (link: http://dx.plos.org/10.1371/journal.ppat.1005531)

"FIP is caused by coronavirus infection" explained Dr. Kim. "Coronavirus infections are very common among cats. However, in most cases, these viral infections cause mild and self-limited enteritis. But some cats will develop a fatal disease which is FIP."



An antiviral compound (red) is bound to coronavirus protease (teal). Coronavirus protease shown here plays an essential role in virus replication. The compound inhibits the function of viral protease by binding to the active site leading to failed virus replication.

Dr. Kim said FIP is usually found in young cats that less 2 or 3 years old.

"FIP arises from certain viral mutation that occur in the infected cats and failure of host immune system to contain such mutated viruses," Dr. Kim said. She explained that the pathogenesis of FIP is primarily immune-mediated; it is the host immune response to virus infection that causes disease in the affected cats.

"FIP occurs in two major forms, effusive (wet) form or non-effusive (dry) form," Dr. Kim said. "The wet form is more common and is characterized by an accumulation of fluids in the abdominal area or chest cavity. Symptoms may include antibiotics unresponsive fever, jaundice, bodily effusions and weight loss. Once typical clinical symptoms develop, they progress rapidly resulting in death or euthanasia in weeks to months."

Since FIP disease progression is rapid and the pathogenesis of FIP is primarily immune-mediated, it has been unknown whether antiviral drug treatment alone can be effective at reversing disease progression in an infected cat. The results of the study showed that inhibiting viral replication is the key to the treatment of FIP.

Read more at Lifelines online: **www.vet.k-state.edu/lifelines/1604.html**

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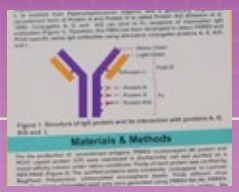

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Kansas State Veterinary Diagnostic Laboratory researchers evaluate space-time pattern and environmental drivers of bovine anaplasmosis

Researchers in the Kansas State Veterinary Diagnostic Laboratory (KSVDL) and the Center of Excellence for Vector-borne Diseases have established a set of models to evaluate the space-time pattern and environmental drivers of bovine anaplasmosis in Kansas. The results have recently been published in PLOS ONE as "Bayesian Space-Time Patterns and Climatic Determinants of Bovine anaplasmosis."

Data used in the study were from diagnostic samples submitted to the diagnostic laboratory between the years 2005–2013. The study results indicate the number of bovine anaplasmosis positive submissions in Kansas have steadily increased and have originated from newer geographic areas during the same period.

Bovine anaplasmosis affects beef and dairy production in almost all the US states, causing significant economic losses to producers. The control of this disease currently relies primarily on infection-avoidance, although an experimental vaccine is used in many areas of the US. The causative bacterium Anaplasma marginale resides in red blood cells causing a hemolytic disease in cattle, which manifests as anemia, abortion, icterus, lethargy, and can cause death, primarily in older animals. Cattle that survive infection are persistent carriers of the bacteria and are a source of infection for other cattle through inadvertent mechanical transmission via blood-contaminated, multi-use needles and surgical equipment, as well as via tick and fly transmission.

"The number of positive anaplasmosis samples submitted to the KSVDL have increased over the years, and the geographical area from where these samples originated has expanded," said Dr. Gregg Hanzlicek, director of Production Animal Field Disease Investigations for the KSVDL. "These changes over time may have occurred because veterinarians have become more aware of the disease, but this study suggests environmental conditions and management practices may have also played a role.

Dr. Ram Raghavan, a spatial epidemiologist at the diagnostic laboratory worked closely with Dr. Hanzlicek in evaluating the space-time patterns of this disease. He said, "Some of the increase in the expansion of tick-borne diseases in the Midwestern region may be attributed to geographic expansion of tick populations over time. Other evidence suggests a growing potential threat for bovine anaplasmosis in newer areas, but a quantitative evaluation of whether or not bovine anaplasmosis has spread to previously unreported areas over time is not readily available. Likewise, information on any potential environmental and climatological drivers behind the space-time expansion of bovine anaplasmosis cannot be easily found, which has disease management implications."

Read more at Lifelines online: **www.vet.k-state.edu/lifelines/1604.html**

Meet our researcher of the month: Dr. Raelene Wouda

Watch this month's video profile about our featured researcher of the month at the KSUCVM YouTube channel and in our online edition of Lifelines:

www.YouTube.com/watch?v=G083YjDa0ig
www.vet.k-state.edu/lifelines/1604.html

Drs. Eshar and KuKanich to receive mentoring award

Congratulations to Dr. David Eshar on having a project accepted for support under Kansas State University's Mentoring Fellowship program. Dr. Eshar, assistant professor of Companion Exotic Pets and Wildlife & Zoo Animal Medicine will work under the mentorship of Dr. Butch KuKanich, professor and assistant department head of anatomy and physiology in a project involving black-tailed prairie dogs.

The project will explore the pharmacokinetics of one commonly administered antibiotic drug (enrofloxacin) and one pain/anti-inflammatory drug (meloxicam) in the prairie dogs.

"This is also an excellent opportunity for mentorship and education starting with Dr. KuKanich mentoring me as a junior faculty member, while we will also be working with an intern and veterinary students on the project," Dr. Eshar said.

Dr. Eshar and Dr. KuKanich explained that despite the fact that prairie dogs are used in research, kept as pets and at zoological collections, limited data are available regarding their medicine and appropriate treatment protocols.

"There is really no research at all in this area," Dr. KuKanich said. "It's a great opportunity for us to break new ground in understanding prairie dogs."

K-State will recognize Dr. Eshar and two other fellowship recipients during the All-University Awards Ceremony May 2, from 3:00 to 5:00 p.m. at K-State Alumni Association Ballroom.

"We weren't sure that our proposal would be accepted since this is a very competitive award process," Dr. Eshar said. "We appreciate the university's support. This project will allow us to enhance the knowledge and promote the medicine of this animal species."

Drs. Butch KuKanich and David Eshar successfully applied for a mentoring research award from K-State.

SCAVMA students fly-in for AVMA's legislative session in Washington

The American Veterinary Medical Association's (AVMA) Governmental Relations Division teamed up with the Student AVMA to host a joint 2016 Legislative "Fly-in" to bring veterinary students and veterinarians to Washington, D.C., to participate in a two-day workshop.Three students from K-State joined a group of nearly 70 students from different veterinary colleges in the U.S. for the event which took place Feb. 28-March 1.

The fly-in introduced participants to the legislative process and briefed them on current federal legislation that impacts the veterinary profession. The AVMA's governmental relations team spent the first day of the workshop educating participants on high-priority legislation before setting them loose on Capitol Hill to meet with their elected officials.

The three students from K-State were Laurel Thomas, class of 2018, and Erin Jobman and Nate Kapaldo, class of 2017.

"My greatest take-away from the AVMA Fly-In is the importance of doing my homework with current legislation, and not being afraid to voice my opinion," Erin said. "To be taken seriously by a US Senator was not only humbling, but very eye-opening and inspiring. It was an amazing opportunity to realize the wealth of knowledge we have been exposed to in the classroom, and the realm of possibility in which we can apply it."

"The AVMA-GRD has great briefs online that provide an easy to understand explanation of bills and the special veterinary considerations," Laurel said. "My legislators' aids didn't expect me to know details about the bills – they know I'm not a lobbyist, they just want a constituent veterinary student's opinion."

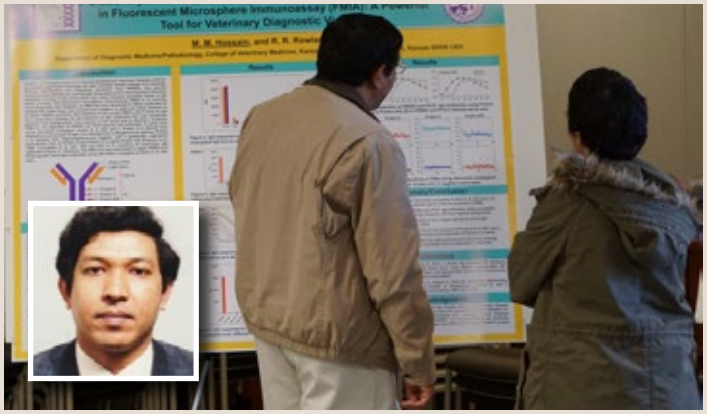
"Being briefly exposed to how this process takes place was a valuable experience that I wish every veterinary student and veterinarian could have," Nate said. "This experience also demonstrated the importance of veterinarians having a vested interest in their field's future."

Second-year student Laurel Thomas joins third-year students Erin Jobman and Nate Kapaldo at the Supreme Court in Washington, D.C., for the AVMA's 8th annual legislative fly-in.

Kapaldo receives WVC's Walther Award

Dr. Ronnie Elmore, associate dean for academic programs, admissions and diversity programs (left), congratulates third-year student Nathaniel Kapaldo, along with Western Veterinary Conference President Dr. Jon R. Pennel, on receiving a 2016 Dr. Jack Walther Leadership Award. Kapaldo was one of 33 students chosen nationwide based on accomplishments, scholastic excellence and long-term leadership potential. Recipients receive a $1,000 award, complimentary registration, lodging, airfare and a daily stipend to attend the 2016 conference, which was held in Las Vegas, Nevada, March 6-10.

Dr. Mofazzal Hossain receives 'Best Award' at KU Research Day



Dr. Mofazzal Hossain, a postdoctoral research associate in Dr. Bob Rowland's lab, is conducting research on the design and development of multiplex serological assays for the detection of antibodies in Rift Valley fever virus and other high consequence animal diseases. He presented his research findings at the Kansas University Postdoctoral Association (KUPA) Research Day Symposium 2016 and received the best award for the best presentation from the symposium.

CVM News Ticker

Drs. Zhoumeng Lin, **Nancy A. Monteiro-Riviere** and **Jim E. Riviere** received Best Paper Award (Honorable Mention) at the Biological Modeling Specialty Section at the 55th Society of Toxicology Annual Meeting, New Orleans, March 12-17. The article title is, "A physiologically based pharmacokinetic model for polyethylene glycol-coated gold nanoparticles of different sizes in adult mice." Dr. Lin is pictured above with the vice president of this specialty section, Dr. Eva D. McLanahan.

Dr. Greg Grauer presented at the 132nd Annual Meeting for the New Jersey Veterinary Medical Association in Florham Park, New Jersey, and the Hawaii Vet Symposium at Turtle Bay Resort on the north shore of Oahu. Topics for both meetings: Reassessment of Normal Values in Kidney Disease; CKD: A tale of Two Cats; UTI Top Ten Questions Addressed; Cats, Calcium, and Kidneys; Use of NSAIDs in Dogs with Liver and Kidney Disease; Early Diagnosis of CKD; Staging and Management of CKD; Importance of Proteinuria and Hypertension in CKD; ACEI and CKD: The Good, Bad, and Ugly; Hyperthyroidism and CKD.

Dr. Susan Nelson presented at the KSU Olathe Campus: Small Animal First Aid. This lecture was open to area high school students, parents, teachers and the general public.

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