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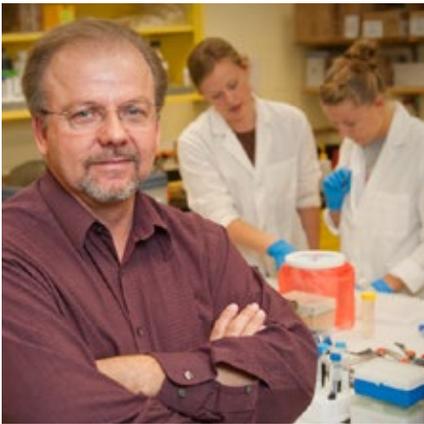
lifelines

News from the
College of Veterinary Medicine
at Kansas State University

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BREAKTHROUGH TECHNOLOGY Dr. Bob Rowland teams up on project to help swine resist PRRS



Dr. Bob Rowland collaborates on a project that has developed pigs that are resistant to the PRRS virus.

It is a discovery that spans decades and careers: A team of researchers at Kansas State University, the University of Missouri and global agricultural biotechnology company Genus plc has developed pigs that are resistant to the most devastating disease in the swine industry.

The disease — caused by the porcine reproductive and respiratory syndrome, or PRRS, virus — has cost the U.S. pork industry more than \$10 billion since it first appeared in the late 1980s. The

discovery of PRRS-resistant pigs could significantly improve animal well-being and save hundreds of millions of dollars each year, said Dr. Bob Rowland, professor of diagnostic medicine and pathobiology, and one of the researchers involved in the discovery.

“In the decades that we have had the PRRS virus, we have looked at vaccines, diagnostics and other strategies and we have never been able to eliminate the disease,” Dr. Rowland said. “This is the first time that we have established the potential to eliminate this devastating disease.”

The collaborative research appears in *Nature Biotechnology* in the article, “Gene-edited pigs are protected from porcine reproductive and respiratory syndrome virus.”

Dr. Rowland has been studying the PRRS virus for more than 20 years and is one of the world’s leading experts on the virus. For the latest research, he partnered with several University of Missouri researchers in the College of Agriculture, Food and Natural Resources, including Dr. Randall Prather, professor; Dr. Kristin Whitworth, research specialist; and Dr. Kevin Wells, associate professor.

Dr. Prather’s laboratory developed the pigs and Dr. Rowland’s laboratory tested for the PRRS virus infection at Kansas State University’s Large Animal Research Center. Numerous undergraduate and graduate students also were involved in the project.

“It is a unique way of tackling viral disease,” Dr. Rowland said. “It is truly a game-changer.”

The resistant pigs lack the CD 163 protein and showed no signs or evidence of being infected with the PRRS virus. The pigs will need to undergo further testing and evaluation before they become available.

The scientists may be able to apply the same concepts to other diseases, Dr. Rowland said. With Kansas State University’s Biosecurity Research Institute and the arrival of the National Bio and Agro-defense Facility, Dr. Rowland sees numerous opportunities to continue research that benefits animal well-being, supports industry and helps meet the global demand for animal protein.

“At the very least, the development of PRRS-resistant pigs is a new tool for improving pig well-being and reducing economic losses,” Dr. Rowland said.

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Novel virus discovered in swine.
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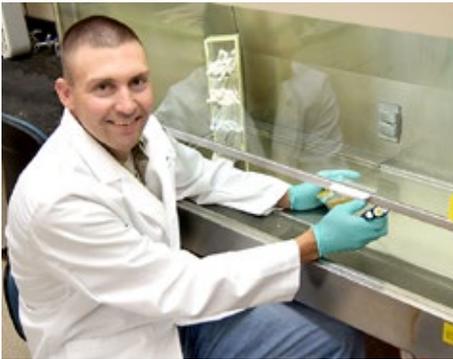


Meet new class of Early Admission Scholars.
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Equine faculty lead seminar.
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Dr. Ben Hause shakes up swine health with discovery of novel pestivirus



Dr. Ben Hause uses metagenomic sequencing to identify and characterize novel types of viruses.

A newly identified virus has been a real pest for pigs. Researchers in the KSVDL identified the virus as a member of the aptly name pestivirus family. A sample was submitted from a veterinarian in North Carolina from a swine herd where uncontrollable shaking, or intention tremors, was observed and resulted in the death of nearly 700 pigs.

“The pigs were shaking so badly they couldn’t walk, couldn’t stand and couldn’t

swallow,” said Dr. Benjamin Hause, an assistant professor in the College of Veterinary Medicine. “The veterinarian described the tremors as similar to those seen with Parkinson’s disease in humans but more severe. A recent report described pigs born with congenital tremors caused by a novel pestivirus similar to one we identified this past summer, but this current situation involved older pigs with disease onset from 5 to 14 weeks of age. This has a significant economic impact, especially in a situation like this where 700 animals had died.”

Historically, the pestivirus family has been associated with important livestock diseases such as bovine viral diarrhea in cattle, border disease in sheep, and classical swine fever virus. Pestivirus infections of pigs have been shown to result in a wide range of clinical symptoms, including neurological disease, and Dr. Hause’s research sheds new light on the pathology associated with this newly described virus.

Earlier this year, Dr. Hause and teammates at the Kansas State Veterinary Diagnostic Laboratory identified and characterized a proposed new species of pestivirus, named atypical porcine pestivirus or APPV, and said it was identified through metagenomic sequencing of swine serum samples submitted to the diagnostic lab. This work was published in the *Journal of General Virology*.

“While we identified a novel, highly divergent pestivirus in swine samples and went on to show that the virus was widely distributed in the U.S. swine herd, we had no idea what, if any, disease was caused by this virus,” Dr. Hause said.

The lab tested samples submitted from two separate outbreaks of grower pigs with uncontrolled tremors in North Carolina. Testing showed the pestivirus was distributed in many tissues and organs of the pigs, including brain, lymph nodes, liver and spleen.

Center of Excellence for Emerging and Zoonotic Animal Diseases holds meeting



Lee Borck, chairman of Innovative Livestock Services Inc., meets with Dr. James Zhu, a researcher with USDA-ARS.

From Nov. 16 to 18, the Center of Excellence for Emerging and Zoonotic Animal Diseases (CEEZAD) at Kansas

State University held its annual general meeting at the environmentally friendly Lied Lodge in Nebraska City, Nebraska. The meeting brought together more than 100 national and international participants gathered in a major initiative to link up CEEZAD principal investigators, other researchers, animal health companies, animal agricultural industry stakeholders and federal administrators and employees. Activities were introduced by the Conference Organizer, Dr. Juergen Richt, director of CEEZAD and Regents Distinguished Professor at the CVM, and by Matt Coats, Program Manager at the US Department of Homeland Security, Science and Technology Directorate.

Presentations of CEEZAD science projects by members of its network and keynote presentations by invited

renowned experts in their fields centered around CEEZAD’s mission of developing countermeasures in the form of vaccines and detection capabilities and epidemiology/modelling products as well as education and outreach initiatives to combat transboundary emerging and zoonotic diseases that threaten US agricultural and public health. Several CEEZAD-funded K-State researchers participated in the meeting including Dr. Bonto Faburay, who discussed his work on the development of a recombinant subunit vaccine for Rift Valley Fever, and Dr. Wenjun Ma, who presented collaborative work on a new NDV-based H5 vaccine candidate for highly pathogenic avian influenza.

Read more at Lifelines online: www.vet.k-state.edu/development/lifelines/1512.html

CVM announces 2015 class of Early Admission Scholars



Back row (from left): Ellie Holtaway, Alexandra Davis, John Sharpe, Chadron Koehn, James Klice III, Grace Davis, Sarah Rogg, and Valerie Klassen. Second row: Ravneet Dhillon, Brooke Bailey, Emma Harding, Molly Jaax, Eric Charboneau, Jackson Ralston, Lane Forge, Sarah Myers, Hannah Grosko, Breanna Fox and William Patterson. Front row: Kristin Reichert, Daria Hagan, Molly Roach, Hallie Lucas, Jaylin Rieck, MaRyka Smith, Madison Ludewig and Katherine Rettmer.

Friday the 13th was a lucky day for a group of 27 Kansas State University undergraduate students, who share a passion for animal health. The College of Veterinary Medicine welcomed these students into its Early Admission Program during an afternoon ceremony in the Mara Conference Center in Trotter Hall.

Since being established in 1999, the Early Admission Scholars program has recruited the best and brightest undergraduate students who want to study veterinary medicine. After acceptance into the program, satisfactory completion of the 64 hours of pre-professional requirements, and at least three years of undergraduate work at Kansas State University, the scholars are guaranteed admission into the College of Veterinary Medicine.

“Qualifying for this program is very special because there are hundreds of

applicants yearly for only a limited number of positions,” said Dr. Ronnie Elmore, associate dean for academic programs, admissions and diversity programs. “These students represent the top 5 percent of Kansas State University students according to their college acceptance test scores. Being selected into the Early Admission Programs gives them the advantage of bypassing the regular applications process, which is already very competitive. For only 112 positions in each incoming veterinary class, we usually receive more than 1,000 applications.”

Successful candidates in the Early Admission Scholars program must maintain a 3.4 grade point average during completion of the pre-professional requirements. At the beginning of the third year of their undergraduate studies, these scholars may petition for enrollment in the first year of the DVM degree program.

The College of Veterinary Medicine assigns a veterinary student mentor to each Early Admit Scholar to stimulate career and academic development and to provide orientation and access to college

activities. The pre-veterinary students will attend regular meetings during the academic year to develop a sense of community and share their progress.

The 2015 class of Early Admission Scholars are: Brooke Bailey, Tecumseh; Eric Charboneau, Lebo; Grace Davis, Stilwell; Alexandra Davis, Overland Park; Ravneet Dhillon, Covina, California; Lane Forge, St. George; Breanna Fox, Lenexa; Hannah Grosko, Overland Park; Daria Hagan, Wichita; Emma Harding, Southlake, Texas; Ellie Holtaway, Carlsbad, California; Molly Jaax, Wichita; James Klice III, Richmond; Valerie Klassen, Lehigh; Chadron Koehn, Marshall, Missouri; Hallie Lucas, Leavenworth; Madison Ludewig, Lancaster, Pennsylvania; Sarah Myers, Olathe; William Patterson, Holton; Jackson Ralston, Overland Park; Kristin Reichert, Brookfield, Wisconsin; Katherine Rettmer, Leawood; Jaylin Rieck, Hartley, Iowa; Molly Roach, Shawnee; Sarah Rogg, Olathe; John Sharpe, Fredericksburg, Texas; and MaRyka Smith, Hoyt.

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VHC faculty host KHC Equine Seminar



Second-year student *Christine Bartley* takes the reins for a demonstration on the Veterinary Health Center's lameness locator. VCH equine faculty including *Drs. Beth Davis, Elisabeth Santschi, and Chris Blevins* co-hosted an equine seminar for members of the Kansas Horse Council. At left is *Dr. Jarrod Younkin*, equine surgery resident, who explains how the lameness locator works (which can be seen on top of the horse's hindquarters). Other sessions included bandaging and emergency first aid, farrier discussion and vaccinations, plus a talk by the K-State Rodeo Coach *Casy Winn*.

CVM News Ticker



Meet Dr. Mike Sanderson, our featured researcher of the month. Watch this month's video interview at Lifelines online as Dr. Sanderson explains the focus of his research work is on food security and mathematically modeling disease and disease transmission in beef production systems.

Dr. Bonnie Rush was appointed as acting hospital director for the Veterinary Health Center. She recently attended the NBVME's North American Veterinary Licensing Examination (NAVLE) Item Writing Workshop in Philadelphia. She has been appointed to the NAVLE examination committee. And Dr. Rush spoke at K-State Olathe about emergencies in equine medicine in a lecture open to high school students, parents, teachers and general public.



Veterinary Health Center

AT KANSAS STATE UNIVERSITY

Funded Clinical Study:

Effectiveness of low-dose meloxicam in slowing the progression of renal dysfunction in cats with chronic kidney disease

The Veterinary Health Center is now accepting participants for a clinical trial that is designed to assess the effectiveness of low-dose meloxicam (Metacam® marketed by Boehringer Ingelheim) in slowing the progression of renal dysfunction in cats with chronic kidney disease. Studies in cats suggest that low-dose, long term nonsteroidal anti-inflammatory drug (NSAID) treatment can slow CKD progression and improve survival time. Participation in this study may extend and improve the patient's quality of life and contribute to research that will change the way we treat CKD in the future. This study is funded in part by the American College of Veterinary Internal Medicine Foundation.

Trial Eligibility Requirements

- Cats with stable CKD
- CKD must be mild to moderate and stable (IRIS Stage II and early stage III CKD) with serum creatinine concentrations ≥ 2.0 but ≤ 4.0 mg/dL.
- Cats with concurrent systemic hypertension and/or proteinuria may be included.

Study Requirements

- CKD will be confirmed and other concurrent disease ruled out at the initial visit.
- Stable kidney disease will be confirmed at a follow up visit approximately 2 weeks later by demonstrating a $< 20\%$ variation in serum creatinine.
- Cats will then be randomly assigned to a treatment group (receive meloxicam) and a control group (receive a placebo).
- Renal function will be monitored at 1, 3, and 6 months

For more information, please contact the VHC at 785-532-5555.

