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Identifying the Next Generation of Pathogens

Dr. Benjamin Hause brings new techniques to Diagnostic Laboratory



Dr. Benjamin Hause uses next-generation sequencing to identify and characterize viruses and bacteria.

He calls himself a bug hunter, but the target of his work consists of viruses that can only be found and identified with special methods and instruments. Dr. Benjamin Hause, an assistant research professor at the Kansas State Veterinary Diagnostic Laboratory, recently published an article about one of his discoveries – porcine enterovirus G – which had previously not been found in the United States.

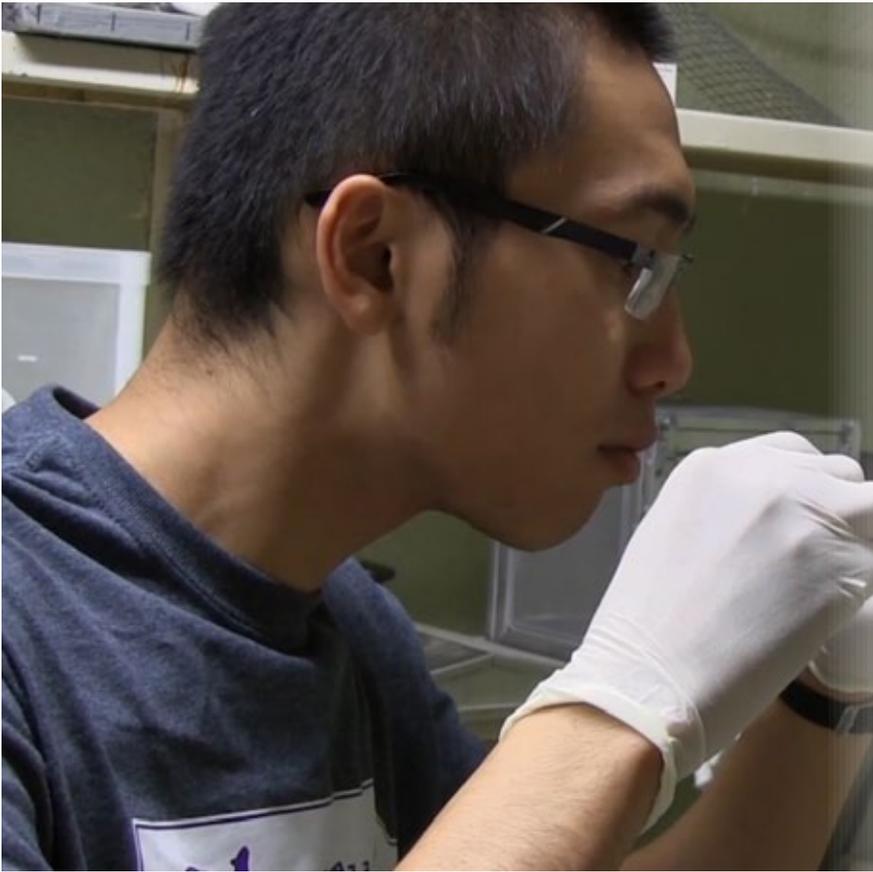
“We had isolated a virus in cells, but didn’t know what it was,” Dr. Hause said. “We used next-generation sequencing to identify it, and it turned out to be porcine enterovirus G, which had been described before, but had never previously been found in North America.”

The virus is thought to be benign and is not known to cause disease, but it had only been reported before in Europe and Asia.

“Fortunately porcine enterovirus G doesn’t do much in pigs, but it raises concerns about other viruses getting through the border,” Dr. Hause said. “We’re not sure if this has been here for some time undetected or is a recent introduction. Coincidentally, the virus was most similar to 2012 Chinese isolates and was detected around the same time as a couple of other viruses: porcine epidemic diarrhea virus and porcine deltacoronavirus, both of which were detected in China in the same time frame prior to the U.S.”

Both porcine epidemic diarrhea virus and porcine deltacoronavirus have caused major economic losses to hog producers in North America, as well as impacting several other aspects of the swine industry. Dr. Hause has mapped these viruses at the Kansas State Veterinary Diagnostic Laboratory as a way to ensure the reliability of the next-generation sequencing methods he uses to identify and characterize pathogens. The technique will soon be offered at the laboratory. For more information about services at the KSVDL, check the lab’s website: www.ksvdl.org/

Video Report: Hands-on summer research program



Class of 2017 member Vien O is one of 17 students involved in the Veterinary Research Scholars Program during the summer of 2014.

This summer opportunity exposes veterinary students to biomedical research. For his project, Vien has been working with Dinesh Erram, a Ph.D. student in Dr. Ludek Zurek's lab in the K-State Department of Entomology.

Their research project is examining how different concentrations of fecal material from different animals affect the egg-laying preferences of biting midges.

Watch our video report this month's which gives a glimpse of what kind of activities Vien was involved with and how the VRSP students presented their findings. The video is posted at Lifelines online: www.vet.k-state.edu/development/lifelines/1408.html

Dr. David Eshar dodges war zone to collect chameleon blood samples



Understanding the physiology of a very tiny animal can pose some very large challenges – some that are unexpected – such as avoiding a war zone. After returning from a trip to study the hematology of the Mediterranean chameleon in July, a clinical sciences researcher discovered his timing had been quite fortuitous.

“This project was performed in Israel during the current intense security situation,” said Dr. David Eshar, assistant professor of exotic and zoological medicine service. “One of the collection sites located on the Mediterranean beach was directly bombarded by Hamas a couple of days after we had worked there. When forced to move into a new location, we had stumbled over a hidden newly tested Iron-Dome anti-rockets site positioned to intercept the Hamas rockets.”

Despite these circumstances, Dr. Eshar and his team evaluated tens of chameleons. Blood samples were collected and analyzed to produce more than 40 new hematological analytes never before described for this species.

“Part of the reasons why this was not previously performed was due to the chameleon's smaller body size and the difficulty in obtaining good enough blood samples to allow the analysis,” Dr. Eshar explained. “In this project, we used our expertise to obtain the blood samples and have it analyzed using machines (Abaxis Vetscan and iSTAT) that require only minute blood volume (~ one large blood drop).”

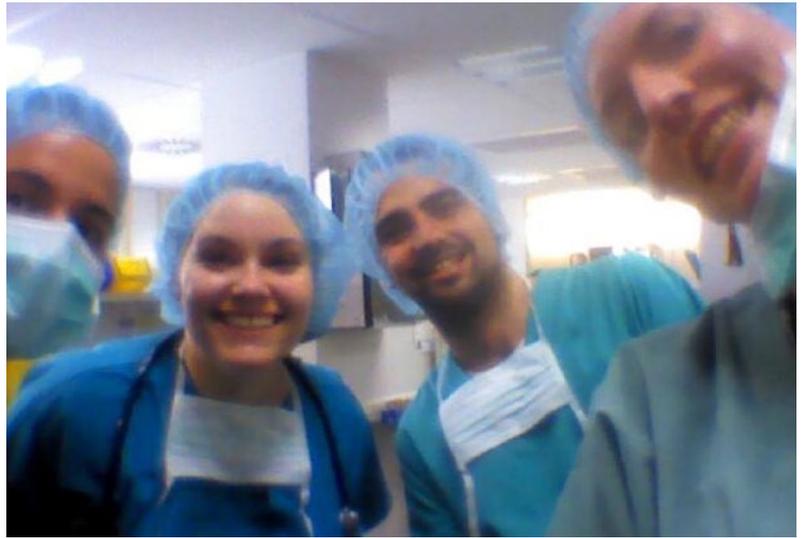
Fourth-year student spends three weeks on externship in France

Summer 2014 was a bon voyage for Stacey Burdick, a fourth-year student in the College of Veterinary Medicine at Kansas State University. She just completed an externship from July 7-25 at Alfort Veterinary School (Ecole nationale veterinaire d'Alfort) in Maisons-Alfort, France.

"I find international medicine very interesting," Stacey said. "I went to Belgium and the Netherlands with Dr. Walter Renberg's international veterinary study tour in 2011 and took his 'Topics in Global Veterinary Medicine' elective as well. I am interested in exotics so it was really interesting to see how this medicine was different in France."

Stacey explained as an example that in the United States, all ferrets are spayed and neutered before they are adopted, but in France they use implants to sterilize the females at a slightly older age and see a lower incidence of adrenal disease.

"The hospital was very busy with surgeries – sometimes up to four surgeries a day – in addition to a full appointment case load, so I was able to observe many surgeries and actually was able to perform a rabbit neuter with another student," she said. "I am not sure if



Fourth-year student Stacey Burdick (second from left) take a quick break from surgery while on an internship at Alfort Veterinary School in Maisons-Alfort, France. She was there for three weeks in July.

I would be able to see all the surgeries on the exotics rotation here, so I think that is very useful for my career out of school."

Third-year student has a 'Plum' of an internship experience

An island vacation is a dream for many college students, but it doesn't usually require permission from the Department of Homeland Security to land on the island. That's exactly what happened for third-year student Rachael Gortowski who had the opportunity of which many veterinary students can only dream – the chance to spend the summer working at Plum Island Animal Disease Center as a visiting intern.

"Getting to go to Plum Island for the summer is an amazing and once-in-a-lifetime opportunity," Rachael said. "I am very thankful for the time I get to spend there."

The Plum Island Animal Disease Center is a Biosafety level – 3 research center managed by the U.S. Department of Agriculture that does work on foreign animal diseases that affect livestock. It is considered to be America's first line of defense against foreign animal diseases that could be accidentally or deliberately introduced domestically.

Rachael's internship was made possible after working for Dr. Bob Rowland, a renowned swine disease researcher and professor of diagnostic medicine and pathobiology at K-State, whose collaborations allow him to send students to the island for the summer. Rachael had worked in Dr. Rowland's lab for a year prior to visiting Plum Island and was trained in a biocontainment facility in Manhattan in preparation for her trip.

"I have been working on an African swine fever project while at Plum Island," Rachael said. "This is an infectious viral swine disease that can also cause hemorrhaging and has a very high mortality rate. Currently, no vaccine has been developed that can prevent the disease. I'm working to produce antibodies to the virus using cell culture. The antibodies will then be used for additional research, such as vaccine development and diagnostic characterization of the disease."

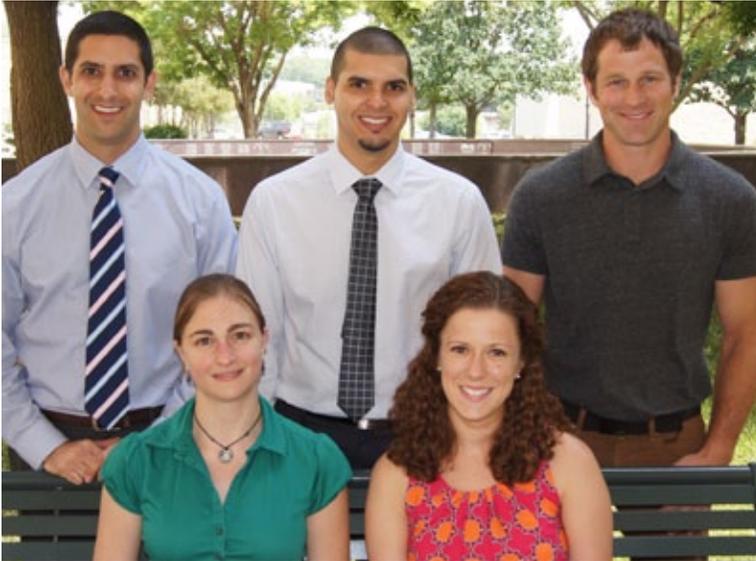
In addition to working on the ASFV project, Rachael has also found time to assist clinical veterinarians at the facility with care for animals participating in research trials.

"It has been invaluable to see live animals with foreign diseases," Rachael said. "After learning about some of these diseases in class, seeing the clinical course of the diseases in real life instead of just as pictures in a book has enhanced my understanding of each disease."



Plum Island Animal Disease Center is a dream opportunity for Rachael Gortowski.

New residents join the VHC in July



Help us welcome the new residents who joined the Veterinary Health Center last month. Back row (left to right): Drs. Chris George, Omar Gonzalez-Cintron and Paxton Harness. Front row: Drs. Stephanie Fissekis and Emily Sharpe.

UPCOMING EVENTS

Aug. 20-22: First-year class orientation sessions.

Aug. 25: Fall classes begin for first-, second- and third-year students.

Aug. 30: Cat Town, K-State vs. Stephen F. Austin University, food served at 4:00 p.m., kickoff at 6:10 p.m.

Sept. 1: University holiday - Labor Day

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