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New dimensions for Animal Health

Interior architecture student and professor collaborate with VHC clinician to design enhanced treatment options for animals using 3-D printing

A research project by an interior architecture & product design student could get some tails wagging.

For her Developing Scholars Program project in the 2014-2015 school year, Kelsey Castinado, now a fourth-year student in the College of Architecture, Planning & Design, turned CT scans of animal bone fractures and deformities into full-scale 3-D prints that clinicians in College of Veterinary Medicine are using for teaching, to plan surgeries and to find more cost-effective ways to treat patients.

The project, "3-D Printing Animal Bone Fractures Through Experimental Applications in Digital Fabrication," was suggested to Castinado by her second-year studio instructor Dustin Headley, an assistant professor of interior architecture & product design. Headley's research interest is in digital design, including 3-D printing.

"I knew that for my third year I wanted to change my research a little bit since I had been doing mostly architecture-based research," said Castinado, who is from Overland Park. "I thought product design-based research would be a little bit more interesting, so



This 3-D model of a dog's skull helped Dr. Walter Renberg determine how much growth on the dog's jaw would need to be removed.

I asked Dustin if he needed any help with his research and if he would like to mentor me in the Developing Scholars Program."

The program pairs underrepresented students with faculty mentors on research projects.

Castinado joined Headley on a collaborative project with the CVM involving 3-D printing of bone fractures and deformities.

"A lot of my research focuses on alternative applications for the design discipline," Headley said. "Instead of studying the lines of architecture or looking at new products to market, I'm interested in looking at what are some of the skills interior architects have that we can engage with other disciplines and expand the scope of the design profession as a whole."

For her project, Castinado used digital files of CT scans provided by the college's Veterinary Health Center (VHC).

"The digital CT scan files are just a lot of small, chopped up pieces of the bone image," Castinado said. "I use a 3-D modeling software to make all those pieces into a whole. I also have to take away all the extra fragments that are attached to the bone so that when it is 3-D printed, it will look like a bone."

The 3-D printing process retains — and can enhance — the important information found on the scan that a doctor or veterinarian needs in making a diagnosis.

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KANSAS STATE UNIVERSITY

College of Veterinary Medicine

See our video report this month "Behind the Scenes at the VHC" at www.vet.k-state.edu/development/lifelines/1508.htm

Whispering Garden Honors Special Animal Companions



Yolande, Larry and Max find their beloved buddy, Sammy, who is memorialized in the Whispering Garden.

The Whispering Garden is administered through the Pet Tribute Program. In this month's Lifelines video, meet some of the people whose pets are remembered in the Whispering Garden and learn how you can honor your pets or those of a friend or family member: www.vet.k-state.edu/development/lifelines/1509.html

Test may help decrease yearly pet vaccines

Scientists at the Kansas State Veterinary Diagnostic Laboratory have modified a test that measures an animal's immune response to the rabies virus, a change that will cost pet owners less money and may help reduce the number of yearly vaccines for pets. The scientists say testing an animal for titers, or antibodies capable of neutralizing rabies, is a valid indication of the animal's resistance to the rabies virus. When the titer test measures 0.5 international units per milliliter or higher, the pet would be considered protected and may only need a booster if bitten or otherwise exposed to the rabies virus, depending on local rabies regulations.

All animals should be vaccinated at an early age with what are known as core vaccines, or those considered by leading veterinary associations to provide protection against the diseases of highest risk to each species. In the past, vaccinated pets would receive a yearly booster for those core vaccines.

The test developed at K-State is not yet accepted by national veterinary organizations as a standard for indicating protection against rabies, though measuring titers currently is used for determining whether cats and dogs need a vaccination for other high-risk diseases.

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Dr. Walter Renberg, an orthopedic surgeon and professor and head of small animal surgery at the VHC, said the 3-D models Castinado and Headley have produced are proving beneficial in a variety of ways.

"While Kansas State University is not the first to use 3-D printing in veterinary medicine, we've thought about doing so for awhile," Dr. Renberg said. "It helps us with a couple of things clinically, particularly with bone deformities, which can be difficult to reconstruct with a CT scan. For example, when planning a surgery to correct a deformity or even determining whether such a surgery is necessary, the model can help us determine the right surgical approach or come up with less expensive alternatives to certain procedures."

That's what happened earlier this summer with a 3-D print Headley made of a dog's malformed tibia, which is one of two bones in the lower hind leg.

"I thought we would have to do an expensive reconstruction that the client probably couldn't afford, but the 3-D modeling gave us a better understanding of the problem and we came up with a less invasive and less expensive route," Dr. Renberg said.

The models also are teaching tools.

"From a clinical standpoint, we can use the 3-D models with clients to explain procedures," Dr. Renberg said. "It can be easier to show them a model than a CT scan."

Dr. Renberg and Headley are continuing to collaborate on other ways 3-D printing could be used.

"We are looking into the ability to explore soft tissues in 3-D at scale, such as tumors and vascular systems," Headley said. Such models would have potential to assist in teaching procedures, too."

While such 3-D models already exist, Renberg said they can be expensive. Having the capability to produce them in-house has cost benefits in a time of tight budgets for state universities.

"I'm very surprised at the capabilities 3-D printing has opened up," Dr. Renberg said.

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Summer Reading Program Goes to the Dogs

The Hope (Kansas) Community Library wrapped up its 2015 Summer Reading Program Aug. 13 with a visit from the Kansas State University College of Veterinary Medicine Mobile Surgery Unit.

This year's Summer Reading Program theme featured "Every Hero Has a Story" and the Mobile Surgery Unit is making its own stories every day. Dr. Brad Crauer, associate professor of shelter medicine, is in charge of the unit which travels to a number of local shelters on a weekly basis performing spays and neuters. The Mobile Surgery Unit provides a service-based learning opportunity for students in the veterinary program meaning students perform the procedures at no cost to the shelters.

Fourth-year students take the two-week rotation and gain valuable surgical experience in addition to being exposed to the unique challenges shelter medicine presents. Often shelter pets have no known medical history. Dr. Crauer

and his students must determine if the pet is suitable for surgery, then perform the procedure with very limited information. In 10 weeks of service, the Mobile Surgery Unit performed 779 spays and neuters.

Dr. Crauer and fourth-year students, Ashley Cole, Lacey Rosenberg and Lauren Sawyer read to children and adults, then offered tours of the Mobile Surgery Unit during their visit to Hope.

The Mobile Surgery Unit had a special connection to Hope. On April 13, 2015, the Mobile Surgery Unit was dedicated to a very special Hope native, the late Chris Gruber, who served as director of development for the College of Veterinary Medicine where he impacted



Dr. Brad Crauer and fourth-year students Lauren Sawyer, Ashley Cole and Lacey Rosenberg read to children at Hope Community Library.

students, faculty, clients and donors. Cheryl Mellenthin of Cat Spring, Texas, donated the funds to purchase the Mobile Surgery Unit, in addition to a generous scholarship, which was also in honor of her late husband, Mark Chapman.

MediVet Biologics plans new lab in Manhattan; Cites work with CVM faculty

A global animal health company is using animal health technology developed at Kansas State University to create a new laboratory in Manhattan.

MediVet Biologics, an animal health company in Australia and Kentucky that specializes in veterinary regenerative medicine and biological solutions for equine and small animals, is opening its Manhattan-based laboratory in early October. It will be the company's second U.S. lab and will be located in the city of Manhattan's Kansas Entrepreneurial Center on Hayes Drive.

MediVet's new lab is the result of an ongoing collaboration between the Kansas State University Institute for Commercialization, or KSU-IC, and the Manhattan Area Chamber of Commerce through its involvement in the Knowledge Based Economic Development partnership.

"We are pleased that the city and chamber were able to provide space in the KEC facility and are proud of the close collaboration with Kansas State University to attract MediVet to the community," said Lyle Butler, president and CEO of the Manhattan Area Chamber of Commerce.

MediVet's Manhattan laboratory will focus on commercially producing and clinically testing an allogeneic stem cell therapy product that has the potential for orthopedic and internal medicine applications for both veterinary and human clinical use.

Dr. Mark Weiss, professor of anatomy and physiology, invented the product.

"I'm very excited about having our commercialization of the product result in a local startup. It's going to help the local economy and biotech jobs," Dr. Weiss said.

Dr. Weiss' invention was patented by the Kansas State University Research Foundation, or KSURF, which handles research disclosures and the patent process, and was licensed by the KSU-IC, which works with public and private industries to license the university technology.

Jeremy Delk, MediVet Biologics CEO, said the company's new lab would help it expand into the equine marketplace through work the CVM's Dr. Jim Lillich, associate professor in anatomy and physiology. It also would accelerate development and testing of a therapeutic canine cancer vaccine with Dr. Raelene Wouda, assistant professor of clinical sciences, and would be a channel for future collaborations with researchers in the CVM.

Volunteers Needed in Nicaragua

This coming January 2016, a group of K-State veterinary students will be traveling to Nicaragua for 11 days with the volunteer organization, Vida Volunteer. The goal of the trip is to provide physical examinations, vaccinations, and spay and neuter procedures to pets and livestock in underprivileged communities while also offering students invaluable clinical experience and a better understanding of the role of veterinary medicine in developing regions. Our student volunteers will be working alongside veterinarians from Central America to set up temporary clinics in the communities they visit. The group is working hard to support as many interested students as they can to make their visit as impactful as possible. If you are interested in learning more about Vida Volunteer and the work these students will be doing or would like to help support the group in their endeavors, please contact Chantal Girard at cmgirard@vet.k-state.edu. Thank you!



CVM News Ticker

Dr. Neala Boyer arrived as a new assistant professor in the Pet Health Center. She joins us after spending 12 years in an American Animal Hospital Association practice in Bellevue, Nebraska.

Dr. Jason Grady arrived as a new assistant professor in Equine Therio/Field Service. He joins us after spending 11 years in a variety of medical contexts that include educating veterinary students.

Drs. Kate KuKanich, Steve Stockham, Laura Armbrust, Butch KuKanich, Mike Dryden and Dan Thomson were among a large group of K-State faculty and alumni who all presented at the recent Central Veterinary Conference in Kansas City, Missouri.

2014 Willie's Pet of the Week

Winner!

MOSIER HALL
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Ruby
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Submit photos of your pet in purple and vote daily to win football suite basketball season tickets and more!

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