The MU College of Veterinary Medicine is pleased to welcome one new faculty member to the Department of Biomedical Sciences and two new members to the Department of Veterinary Medicine and Surgery.

Nicole Nichols, PhD

Joining the Department of Biomedical Sciences this semester as an assistant professor is Nicole Nichols, PhD.

Nichols earned a PhD in biomedical sciences, concentrating on neuroscience and physiology, at Wright State University’s Boonshoft School of Medicine in Dayton, Ohio. She then joined the University of Wisconsin in Madison as a postdoctoral fellow in respiratory neurobiology.

In her new position at the MU CVM, Nichols’ primary focus will be conducting research, in addition to teaching veterinary endocrinology and providing other services to the department, university and community.

“I decided to pursue academia because I want to teach and mentor students to help them reach their full potential and love physiology and science as much as I do,” Nichols said. “In addition, I want to conduct research in a university setting in order to better understand therapeutic targets to help people suffering from respiratory diseases and dysphagia as a result of motor neuron death.”

Her research focuses on understanding how respiratory plasticity occurs and can be harnessed in models of respiratory motor neuron death and dysphagia including neurodegenerative diseases such as ALS.

In her short career, Nichols has already accumulated numerous accolades. She holds a Pathway to Independence grant from the National Institutes of Health’s National Heart, Lung, and Blood Institute, and she just completed a prestigious Parker B. Francis Fellowship in pulmonary research.

Nichols also is the recipient of the 2015 Giles F. Filley Memorial Award for Excellence in Respiratory Physiology and Medicine. The award, presented annually to an individual demonstrating outstanding promise based on his or her research program in respiratory physiology and medicine, is one of the highest honors for an investigator in the field.

In her free time, Nichols enjoys reading, working out and running.

Joann Kunz, DVM, CVA

For Joann Kunz, DVM, CVA, joining the Department of Veterinary Medicine and Surgery in late 2014 represented a homecoming. She first came to the CVM as a Ross University School of Veterinary Medicine student completing her clinical year of study at MU. She said that was when she realized how valuable the college and its faculty would be to her career.

Once she completed her DVM, she joined the Community Practice Section at the MU Veterinary Medical Teaching Hospital. Although

Continued on page 2
she left two years later to work in private practice, she said she knew she would return to the CVM and teaching someday.

After more than seven years in private practice, Kunz is back as a clinical instructor of shelter medicine. “I enjoy the unique challenges of this profession and value the relationships I have developed with my clients,” Kunz said. “It is very special to care for their pets from puppy through the senior years. Now that I am back into teaching, I can pass all of these enjoyments along to my students as they grow from students into compassionate veterinarians.”

During the shelter medicine rotation, a two-week required course for third- and fourth-year veterinary students, students receive hands-on spay and neuter training with animals from the Central Missouri Humane Society. They also learn about disease recognition in shelter medicine. Kunz said she is excited to be part of the growing program.

“I really enjoy shelter medicine and getting involved with the community to work together to care for all the homeless animals in need. I think it’s so important that students realize all the different ways veterinarians can help in this setting.”

Kunz is certified in mixed animal acupuncture. In her free time, she enjoys horseback riding with her husband and relaxing at home.

Pedro Melendez, DVM, MS, PhD

Pedro Melendez, DVM, MS, PhD, didn’t plan on becoming a veterinarian. As a child growing up in Santiago, Chile, he dreamed of being a marine biologist.

However, his mother was injured in a car accident around the time when he would have left home to go to college. Choosing to help care for her, he stayed in his hometown and attended the University of Chile, which lacked a marine biology program. Melendez decided to study veterinary science instead.

The decision not to pursue his childhood passion could have left Melendez unhappy, but during an internship in his third year of university he discovered his fascination with cows. After completing his degree, he worked with dairy and beef cattle in private practice before joining the University of Chile food animal medicine faculty. Melendez later moved to the United States to pursue a residency in food animal medicine at the University of Florida, where he received his MS and PhD. After serving as an assistant professor there and a professor at the University of Santo Tomas in Chile, Melendez recently joined the faculty of the Department of Veterinary Medicine and Surgery as an associate professor of food animal medicine and surgery.

Melendez, whose interests include dairy production medicine, lactation management and metabolic diseases, plans to promote relationships between the CVM and his contacts in Chile and Argentina by helping students find externships there. He admits he was terrified to speak in public when he was a student, but he has overcome those fears and loves the opportunity to teach students the lessons he has learned in his career, he said. He especially enjoys teaching students the importance of using scientific methods as clinicians, not just when doing research.

In his free time, Melendez enjoys playing tennis and volleyball and spending time with his wife, his 19-year-old twin sons, his 13-year-old daughter and their miniature schnauzer.
A drug used for decades to treat leukemia may have other uses in the fight against cancer, researchers at the University of Missouri have found. Previously, doctors used 6-Thioguanine, or 6-TG, as a chemotherapy treatment to kill cancer cells in patients with leukemia. In recent years, many doctors have shelved 6-TG in exchange for newer drugs that are more effective. Now, Jeffrey Bryan, DVM, MS, PhD, an associate professor of oncology at the MU College of Veterinary Medicine, and his colleagues found that 6-TG can not only kill cancer cells, but also works to change how certain cancer cells function, weakening those cells so they can be killed by other drugs.

Every cell in the body has certain genetic characteristics called epigenetic markers that give cells instructions on how to act, when to multiply and when to die. Cancer cells often have epigenetic markers that cause genes to be either turned off or out of control. This causes those cells to grow rapidly, become difficult to kill and ultimately damage the body. When testing the drug on cells from dogs with cancer, the MU researchers found that 6-TG can affect these epigenetic markers in cancer cells through a chemical process called demethylation. This process works to turn off damaging epigenetic markers and turn on markers that make the cells act in a healthy manner. Bryan says this discovery could lead to future cancer treatments using multiple drugs to fight the disease from different sides.

"While 6-TG is no longer one of the more powerful cancer-killing drugs doctors have at their disposal, we found that it could still be useful to fight cancer in conjunction with other drugs," said Bryan, who also is the director of the Comparative Oncology and Epigenetics Laboratory at MU. “If we can use 6-TG to turn off dangerous markers in cancer cells so that those cells become easier to kill, we then can use more powerful cancer-killing drugs to eliminate the cells for good.”

Bryan says this research could potentially open doors for future research on other old cancer drugs that are no longer used by doctors. By re-examining other potential uses for these old drugs, Bryan says more effective treatments could be found. He also says that doing this research on dogs with cancer could translate well to human diseases. “Epigenetic markers work similarly in dogs and humans, so we expect to see similar results with these drugs in humans as we do in dogs,” Bryan said. “This is a ‘one step back, two steps forward’ approach to cancer research. Gaining approval from the Federal Drug Administration (FDA) to use new drugs to treat human diseases is a difficult, time-intensive process. By examining alternate uses of old drugs in dogs, we hope to be able to expedite that process down the road when we introduce these novel combination treatments in humans.”

This study was published in *BMC Veterinary Research*. Bryan’s co-authors include Senthil Kumar, PhD, an assistant research professor and assistant director of the Comparative Oncology and Epigenetics Laboratory at the MU College of Veterinary Medicine, and Brian Flesner, DVM, MS, a former resident at the MU College of Veterinary Medicine and current faculty member at Louisiana State University.
The 2015 MU/Zoetis Dental Continuing Education Weekend will be held April 25-26 at the University of Missouri College of Veterinary Medicine. Dentistry can be a profit center for veterinary practices while simultaneously allowing veterinarians to meet the dental needs of patients and improve their quality of life and that of their owners. Practical information and skills for both DVMs and veterinary technicians and assistants will be the priority for this year’s dental weekend.

Lectures are available on an open basis. Attendance at the lectures is required for entry into the wet labs. The lab portions will be hands-on and practical with a good teacher/student ratio. Attendance at the Sunday (DVM only) wet lab will be limited to 36 veterinarians. In the bonus lab session Sunday afternoon, to the extent possible, lab attendees’ requests to learn specific procedures will be accommodated.

All lectures will be held at the MU College of Veterinary Medicine Adams Conference Center and Auditorium. Wet labs will be in the Anatomy Lab in the Veterinary Medicine building.

For questions about the program, please contact Dr. Richard Meadows; MeadowsR@missouri.edu or (573) 882-7821. For registration questions, please contact Kate Stottle; muconfl2@missouri.edu or (573) 882-9551.

CVM RECEIVES SUPPORT FOR SHELTER MEDICINE

With grant support from nonprofit PetSmart Charities, the largest funder of animal welfare efforts in North America, 365 veterinary students at four different universities will be trained in spay/neuter surgery and will perform roughly 11,000 surgeries within the first year of each grant.

The MU College of Veterinary Medicine is one of four recipients of the grant funding from PetSmart Charities. The college will receive $429,352 over two years to support operational expenses to expand the shelter medicine program, a two-week required course for third- and fourth-year veterinary students. The rotation provides hands-on spay and neuter training for approximately 120 students for each of the two years, with students conducting an average of 32 spay and neuter surgeries each, with an estimated average of 30 percent of those surgeries being conducted on pediatric cats and dogs.

Training more veterinary students on spay and neuter procedures can have a positive and direct effect on the pet homelessness problem.
Each year nearly half of American adults make New Year’s resolutions. With obesity on the rise, losing weight and exercising more are two of the most common pledges, according to the Journal of Clinical Psychology.

But people aren’t the only ones who could benefit from these resolutions. The Association for Pet Obesity Prevention estimates that in the U.S. nearly 53 percent of dogs and 58 percent of cats are overweight or obese.

“ Obesity is a significant health concern for both people and pets and can be a debilitating disease in both species,” said Allison Wara, DVM, clinical instructor in the MU College of Veterinary Medicine. “ Obesity predisposes pets to a variety of conditions including — but not limited to — joint disease, decreased quality of life and a decreased lifespan.”

Wara is the program director of the new Renew Animal Clinic at the MU Veterinary Medical Teaching Hospital. The clinic’s mission is to provide state-of-the-art techniques in physical rehabilitation and nutritional management in order to maximize a pet’s recovery process, mobility and overall well-being.

Through inpatient or outpatient care, patients can receive physical therapy using modalities such as an underwater treadmill as well as a customized nutrition plan.

“Targeted nutrition and physical rehabilitation are proven modalities for facilitating successful outcomes after surgery, minimizing the incidence and progression of various diseases, and enhancing quality of life for our dogs and cats,” Wara said.

One of the clinic’s first patients was Bear, an older black Labrador retriever with polyarthritis, an arthritic condition that affects more than one joint. In the summer, Bear participates in low-impact activities such as swimming, but in the winter he is less active, which leads to increased discomfort and weight gain. His owners brought him to the clinic for physical rehabilitation and a weight-loss plan to assist with his joint disease and to restore him to his ideal body condition.

Bear visits the VMTH three days each week for hydrotherapy with the use of an underwater treadmill, which promotes active range of motion of his joints and strengthening of his muscles. He has also received an individualized weight-loss plan with a prescription weight-loss diet to help manage his arthritis. Weight reduction has been shown to reduce the pain and impact on arthritic joints and improve overall mobility.

Since Bear began the program in October, his owners have noticed positive changes in his activity and comfort level at home. He is more willing to go for walks, and his endurance level during walks has improved. The clinic team has been able to increase the resistance and duration of his treadmill sessions, changes that Bear has tolerated well.

Bear has been losing weight at a slow and steady rate, which is the goal for long-term success, Wara said.

The Renew Animal Clinic treats both dogs and cats. Wara said overweight pets with a history of orthopedic and/or neurologic disease are among the most frequently seen.
Jan Knoche loves golden retrievers. Since she co-founded Love a Golden Rescue in 2001, the St. Louis-based organization has rescued more than 1,000 surrendered, abandoned or abused golden retrievers.

So when Knoche heard Sydney’s story, she took action. At three months old, the puppy was run over by a lawnmower, and his left hind leg was amputated. The owner decided euthanasia was the best option.

Luckily for the young golden retriever, Knoche got involved. The owner was persuaded to surrender the dog, who then traveled from his former home in Kentucky to St. Louis, where Knoche lives.

When she adopted him July 13, 2013, Knoche decided he deserved a new name to go with his new life: Keeper. She quickly came to love him.

“He’s just a gentle giant,” she said. “He’s never met an enemy.”

Unfortunately, as Keeper grew, he began having difficulty using his remaining back leg. He didn’t appear to be in pain, but he walked abnormally on the leg, often choosing to scoot around instead. Knoche’s local veterinarian suggested Keeper try physical therapy using an underwater treadmill, but still the dog struggled to use his leg and tired easily.

Because another of her dogs had previously received treatment at the University of Missouri Veterinary Medical Teaching Hospital, Knoche decided to see if veterinarians there could do anything to help.

“We wanted to give him a chance,” she said.

At the VMTH, radiographs and computed tomography (CT) scans were performed to assess Keeper’s tibia and identify how best to help him. Keeper had an uncompensated bi-apical deformity, in which two deformities of the bone occur in the same direction. This type of deformity results in the knee being positioned to the outside of the body when the foot is placed directly under the pelvis, making it hard for him to balance and support his weight.

James Tomlinson, DVM, MVSc, MU professor of small animal ortho-

Continued on page 7
pedic surgery, said most dogs do well with only three legs. But Keeper’s accident likely damaged the growth plate at the top of his tibia, causing one side of the growth plate to grow but not the other side, Tomlinson said. This led to his right hind leg being crooked.

Dogs generally distribute about 60 percent of their weight to the front legs and 40 percent to the back, Tomlinson said. Following a hind leg amputation, most shift their weight so about 70 percent is distributed to the front legs. Keeper was unable to do this.

“His back leg was so crooked that he couldn’t shift his weight,” Tomlinson said. “He couldn’t get himself up or support himself.”

Tomlinson worried that Keeper’s mobility problems, if not addressed, would worsen as the young dog grew older and gained weight. His quality of life could decline further. To prevent this, Tomlinson devised a plan to straighten Keeper’s leg so it could bear weight.

“Even when dogs have these types of deformities, there are things that can be done to help them have a better quality of life,” Tomlinson said. “Obviously, he’s not going to be 100 percent normal, but hopefully being a three-legged dog he will be acceptably functional.”

Keeper’s surgery involved two cuts to the tibia to straighten the bone. The first, called a proximal osteotomy, was made across the width of the top portion and packed with a bone graft from Keeper’s left front leg. In the second, called a distal wedge ostectomy, a wedge-shaped portion of bone was removed near the bottom of the tibia.

Because Keeper only had the one back leg, it was imperative that the bone be as strong as possible to keep it straight while it healed. To ensure this, Keeper’s surgeons implanted an interlocking nail secured with three bolts as well as a bone plate secured with 10 screws.

The surgery was uneventful, but it was only the beginning of Keeper’s recovery. Because Keeper enjoyed playing with Knoche’s other dogs, which would not have been conducive to his recuperation, Knoche decided to keep him at the VMTH for the first month.

Knoche, who has rescued many dogs with health problems, said it is heartwarming to watch them blossom as they receive the loving treatment and homes they deserve. She said she is grateful for the attention and care Keeper received at the VMTH.

“We felt if any place could give us a miracle for Keeper it would be (the VMTH),” she said. “We have got our miracle, I believe, and we are so thankful.”
Mucus Retained in Cystic Fibrosis Patients’ Cells, Leads to Potentially Deadly Infections

Cystic fibrosis is a genetic disorder that affects one out of every 3,000 children in populations of Northern European descent. One of the key signs of cystic fibrosis is that mucus lining the lungs, pancreas and other organs is too sticky, which makes it difficult for the organs to work properly and, in the lungs, attracts bacteria and viruses resulting in chronic infections. Researchers at the University of Missouri recently found that cystic fibrosis mucus actually gets stuck inside some of the cells that create it, rather than simply becoming stuck on the outside linings of organs.

Lane Clarke, DVM, PhD, a professor of biomedical sciences in the MU College of Veterinary Medicine, says that now that it is better understood how mucus becomes trapped in the body, scientists can begin working on potential treatments for patients with cystic fibrosis that help cells remove the sticky mucus more quickly.

“Normally, special cells create mucus and easily push it out to the linings of the organs where it belongs,” said Clarke, who also is an investigator in the MU Dalton Cardiovascular Research Center. “However, in cystic fibrosis patients, some cells that create the mucus fail to completely release the mucus, so the mucus becomes stuck halfway in and halfway out. This makes mucus clearance more difficult and potentially would allow bacteria to have an easy pathway to infecting cells to cause diseases like pneumonia.”

Clarke also examined the characteristics of mucus stored within the cells and found that it is not as acidic as in normal cells.

“Previously, cystic fibrosis researchers disagreed as to whether cystic fibrosis cells also have a defect in properly acidifying areas inside cells,” Clarke said. “Finding that cystic fibrosis mucus granules are not acidic is important because the lack of acidity slows the release of products from other secreting cells.”

“This study was published in the Journal of Clinical Investigation.

Second-Year Students Win Radiology Bee

Amber Graham, Amelia Kaeding and Damian Peyton, second-year veterinary students at the University of Missouri College of Veterinary Medicine, claimed first prize in the 2015 Student American Veterinary Medical Association Symposium Radiology Bee. The March 21 academic competition was one of several events during the annual student symposium, which was hosted this year by the University of Minnesota.

The team entered the competition on a whim, said Peyton, who also finished second place in the individual competition.

“We went up against several teams consisting of both second- and third-year students in a bracket-style, head-to-head elimination competition,” Graham said. “It was intimidating at first, but it became obvious that our radiology training from lecture and lab was serving us well.”

“It helped that we just finished our radiology course at school, so the material was still fresh in our minds,” Kaeding said.

The students credited their radiology instructors, Jimmy Lattimer, DVM, MS, Lisa Britt, DVM, MS, John Haller, DVM, and Everett Aronson, DVM, MS, with preparing them to excel among their peers.
Francesca Tocco understands the pain of losing a pet.

“I have lost my fair share of four-legged, winged and scaled family members,” said Tocco, a doctoral candidate in the University of Missouri Sinclair School of Nursing and the Research Center for Human-Animal Interaction (ReCHAI) at the MU College of Veterinary Medicine. “The losses have knocked me down, shaken me at my core and altered the bedrock of my day-to-day life. However, I’ve learned that those losses feel so monumental because I’ve truly connected with my furry family members.”

In an effort to help people work through their unique emotions after losing their pets, Tocco designed the Together In Grief, Easing Recovery program. The program assists with many aspects of companion animal loss, including family counseling, resources to help people cope with the loss of an animal and training for veterinary clinicians and students.

To honor the lives of animals who have passed, the TIGER program will offer the third annual Companion Animal Memorial Event at 11 a.m. May 2 at the Adams Conference Center at the College of Veterinary Medicine, 1600 E. Rollins.

“Memorialization is a very special part of the grief process,” Tocco said. “It can be comforting to be in a room with like-minded individuals who recognize that a pet can be a family member and a best friend.”

The loss of pets due to death is inevitable given their shorter lifespans when compared to their human families. Many people experience this loss with an expression of grief similar to that as when a human family member dies. The memorial event is designed to help owners celebrate the lives of their deceased companion animals while moving through the grieving process, gaining closure and connecting with the memories associated with their departed companion animals.

Speakers at the event will include Carolyn Henry, DVM, MS, associate dean for the CVM Office of Research and Graduate Studies and a professor of veterinary oncology, and Chad Johannes, DVM, medical director for Kansas City, Kansas-based Aratana Therapeutics Inc., a pet therapeutics company.

Participants are encouraged to bring a memento of their pet to share during the event.

“All who have ever loved a companion animal know the pain of losing them,” said ReCHAI Director Rebecca Johnson, RN, PhD, FAAN. “Our memorial event gives people a chance to remember, to share and to heal.”

Johnson is also a professor at the MU College of Veterinary Medicine and the Millsap Professor of Gerontological Nursing in the Sinclair School of Nursing.

In addition to the memorial, the TIGER program has recently formed a pet loss support and grief group. Upcoming meetings are scheduled for 2 to 3 p.m. on April 25, May 9 and May 23 in the Adams Conference Center.
John Middleton, DVM, PhD, has earned many accolades in his career as a food animal veterinarian. Witnesses to one of his most recent honors saw the renowned mastitis and milk quality expert escort a squad of mallard ducks through the Peabody Hotel in Memphis, Tennessee. While Middleton, who is a professor at the University of Missouri College of Veterinary Medicine, is more accustomed to working with cows than ducks, he took his Honorary Duckmaster duties in stride on Feb. 1, as the ducks were paraded at 5 p.m. from the marble fountain in the hotel’s lobby back to their Royal Duck Palace on the rooftop.

The hotel selected him as Honorary Duckmaster to recognize his service as the president of the National Mastitis Council, which was holding its annual meeting at the Peabody Feb. 1-3. The meeting was the culmination of Middleton’s yearlong term as the organization’s leader. Members of the NMC presented him with the NMC Distinguished Service Award for Presidential performance.

The NMC formed in 1961 in the United States and has evolved into a global organization whose members work to control mastitis, and improve dairy cattle health and milk quality. Middleton said among his goals during his year at the organization’s helm were to increase global awareness of the NMC and to move it toward financial stability.

“We had a positive year financially, and we are working on initiatives to increase sponsorship of meetings and increase the value of the organization to members and sponsors,” he said. “That said, as an information-based organization, financial stability in an era when people have ready access to information from other sources will continue to be a challenge.”
SCENES FROM THE 28TH ANNUAL GDB

Drs. John Dodam (left) and Chuck Wiedmeyer (right) served as emcees for the Gentle Doctor Benefit, while auctioneer Dr. Densil Allen kept the GDB live auction bidding lively.

CVM first-year students Magan Wells (left) and Lauren Clement, recipients of scholarships funded by the GDB, thank the audience for its support.

The Antidote, aka, Dr. Tim Evans (above) celebrates the winning bid for the Nerd-tacular Weekend, while CVM Dean Neil C. Olson is escorted by students Brittany Hoffman and Maddie Chapin as the Dinner with the Dean is auctioned.

(Top) MU Chancellor Dr. R. Bowen Loftin visits with Dr. Burton Schaaf.
(Center) Provost Dr. Garnett Stokes shares a laugh with Susan Fales.
(Bottom) Dr. Ron Cott greets guests from the Stokes Farm.

Barbara Stampfli-Savill (right) discusses the selection in the raffle for 25 bottles of wine with students Katie Duneman and Grace Willis.