**CIRCOVIRUS IS AFFECTING DOGS**

While the purpose of the ‘Animal Tracks’ is to keep the Duke research community informed on issues with research, every now and then an item comes along that requires our attention, while it may not be research animal care & use, it does involve animals and could affect us and our families. This is one of those issues, so this month we are departing the regular trail for a bit of information regarding a rather new, not yet well-documented, but very serious viral infection of dogs.

*Circovirus* in dogs is new, not yet reported in North Carolina, but it is likely only a matter of time until it gets here; especially with many of our community traveling during the holidays. Adding to the risk is that the presentation may mask as a perennial holiday syndrome—‘garbage gut’ (e.g. Fido getting into the turkey drippings, overeating the roast beef or bloating with dressing and gravy) where that too presents as intestinal distress, vomiting and/or diarrhea.

For those of us sufficiently long in the tooth to recall the horrendous days of parvovirus in the early 80’s (pre-good therapy and pre-vaccine), this new disease has the tenor of a softer and kinder version than parvo diarrhea (if any disease can be soft and kind). The best free advice regarding this new scourge is to keep your beasts nearby in the weeks to come, especially alert for signs of intestinal distress, and seek veterinary consultation if those signs occur.

On page two we have borrowed heavily from an FAQ published by the American Veterinary Medical Association regarding Circovirus.

**ANNUAL REFRESHER TRAINING (ART)**

The 2014 edition of the Annual Refresher Training will soon be on the OESO training website. All members of an active Duke animal use protocol must complete the Annual Refresher Training not later than 31 January each year to remain compliant with the grants & contracts stipulations, the institution’s PHS Assurance, the USDA regulations, the AAALAC accreditation position, and the Duke IACUC policy. One 30-45 minute activity addressed a half-dozen regulatory requirements in one swoop. Not a bad deal!

ART may be completed as early in the new calendar year as you choose, and is only required once per calendar year (Jan to Dec), but must be completed prior to approval of an Annual Progress Report, Amendment, or new Protocol submission. Regardless of the number of approved protocols, ART is only required once each calendar year.

ART does not replace or revisit the initial training (Animal Handler’s 1 & 2) required of new research personnel. ART focuses on compliance trends in the Duke animal program and highlights those where we have had more non-compliances or where the IACUC believes additional attention is warranted. The goal of ART is educating to prevent serious non-compliances while providing practical updates to changes in federal guidance. ART also reaffirms our individual and institutional obligations for assuring compliant animal care and use.

ART is brief and shouldn’t take more than 45 minutes to complete. Yes, there is a short quiz (sorry, got to document you took it). If you’ve questions, contact Bill Wade (w.wade@duke.edu) for more information.
**Q: What are circoviruses?**  
**A:** Circoviruses are small viruses that have been known to infect pigs and birds. They are also known to survive well in the environment once shed from affected animals. Porcine circoviruses are very common throughout the world. Porcine circovirus 2 can cause postweaning multisystemic wasting syndrome in 2-4 month old piglets, resulting in weight loss, poor growth and high death rates. Although porcine circoviruses were first identified more than 30 years ago, there is still much unknown about the viruses. Circovirus can also infect birds, causing beak and feather disease in psittacine birds (such as parrots, parakeets, budgies and cockatiels), infectious anemia in chickens, and deadly infections in pigeons, canaries and finches.

**Q: What is canine circovirus/dog circovirus?**  
**A:** The distribution of the virus in the U.S. is not yet known, but dogs infected with circovirus have been reported in California and circovirus may be associated with recent illness and death of dogs in Ohio. The circovirus identified in dogs shares more similarity to porcine circovirus than to the avian circovirus, but it is not the same as porcine circovirus. This canine circovirus was first reported in June 2012 as part of a genetic screening of canine samples for new viruses. Circovirus was detected in 2.9% of canine sera collected for routine serological testing. In April 2013, a similar virus was detected in a California dog that presented to the UC Davis School of Veterinary Medicine for worsening vomiting (containing blood) and diarrhea. PCR tests on dogs with and without clinical disease indicate a prevalence rate of between 2.9-11.3%. The data suggest that this new virus, either alone or as a co-infection with other pathogens (disease-causing organisms, such as bacteria and viruses), might contribute to dog illness and deaths. However, the authors also reported that circovirus was identified in the stool of 14 out of 204 healthy dogs, suggesting that infection with circovirus does not always result in illness. There is still much to learn about this newly identified virus, including its role in disease.

**Q: Are the dogs in Ohio infected with circovirus?**  
**A:** No. Circovirus was suggested as a possible cause of illness and death of dogs in several parts of Ohio in late August/early September 2013, but it is no longer being considered as the primary cause of the illnesses. Circovirus was detected in the stool of one ill dog in Ohio, which is the first time the virus has been identified in Ohio, but this does not mean that circovirus has been confirmed as the cause of any of the recent illnesses. The Ohio Department of Agriculture continues to investigate the illnesses, and this will take time.

**Q: Are the dogs in Michigan infected with circovirus?**  
**A:** As of October 3, the Michigan Department of Agriculture and Rural Development has been investigating illnesses similar to those observed in Ohio. The investigation will take time, and at this time they are not confirming that circovirus is involved.

**Q: How are dogs being infected with circovirus?**  
**A:** The route of infection is still unknown, but the basic principles of viral spreading suggest that direct contact with an infected dog or its vomit or diarrhea would present a higher risk of infection. However, many viruses can be spread from animal to animal through the use of shared bedding and equipment or through human contact with an infected animal prior to handling of an uninfected animal. In pigs, circovirus is spread through the manure and through contact with respiratory secretions. Although some of the dogs showing clinical disease were recently boarded or at doggie daycare facilities, this should not be taken as an indication that this virus is only spread at boarding kennels or that boarding your dog or taking it to daycare will result in infection. Any parent who has taken their child to daycare knows that a high concentration of children in an area can increase the spread of colds and other illnesses; the same thing can happen when dogs are gathered in an area.
Q: Are there other diseases that are similar to circovirus infection?
A: There are many potential causes of vomiting and diarrhea, so the presence of these signs does not mean your dog is infected with circovirus. For example, vomiting and diarrhea can also result from infection with canine parvovirus, Salmonella bacteria, canine distemper virus, Campylobacter bacteria, Clostridium perfringens enterotoxin A gene bacteria, and Cryptosporidium and Giardia species (both of which are single-celled parasites). Even a simple “dietary indiscretion,” such as getting into the garbage or overeating rich foods or treats, can result in vomiting and diarrhea. Not all of these problems are life-threatening, and many cases of diarrhea and vomiting resolve with simple treatment.

Q: What should I do if I see these signs in my dog?
A: If your dog is showing signs of illness, contact your veterinarian to get the correct diagnosis (including any necessary laboratory testing). Even if it turns out to be something minor, you can have peace of mind knowing that your dog’s health is not threatened. If your dog is vomiting or has diarrhea, contact your veterinarian. Dogs with diarrhea and vomiting could have a range of diseases, some of which can be life-threatening unless diagnosed and treated early. Prompt treatment of vomiting and diarrhea, regardless of the cause, gives your dog a better chance of a quick recovery and can also cost you less in the long run – delaying veterinary care can mean that your veterinarian has to treat a dog that’s much more sick than he/she would have been if seen earlier, and that costs more. In the small number of cases so far, prompt veterinary treatment was critical to a good outcome for that dog.

Although we still have a lot to learn about this circovirus, there’s no cause for panic. We know that dogs infected with circovirus don’t always become ill, but we don’t know how much of the virus they may shed in their stool or how much risk these dogs present as sources of infection for other dogs.

Q: What should kennels and doggy daycare facilities do?
A: Follow good hygiene and sanitation measures, as you should always do: don’t allow ill dogs to mix with others; clean and disinfect areas where ill animals have been, and regularly clean and disinfect all dog areas; and monitor dogs for signs of illness, and immediately report any signs of illness to the dog’s owner.

Q: If my dog has circovirus, can I become infected?
A: There is no evidence to date that this virus can be transmitted to you from your dog.

Theoretically, it’s possible, and that’s one of many reasons why it’s so important that you pick up after your own dog and avoid contact with stool from other dogs when possible. Simple, common sense measures are in order, including the avoidance of contact with ill animals (and if your dog is ill avoid contact with other dogs until your dog has fully recovered) and cleaning up after your pet passes stool. A healthy pet is more likely to have a fully functional immune system to fight infections, so keeping your pet healthy with good preventive care is also important.

Q: Is there a vaccine for circovirus?
A: Not at this time. This is a very recent development, and it takes years to develop vaccines and get approval for use in pets.

Note: Thanks to the American Veterinary Medical Association and the American Association of Veterinary Laboratory Diagnosticians for their assistance in creating these FAQs!
LAB MEETING TALKING POINTS FOR 2014

There are several items that lab members may consider as lab meeting talking points for the beginning of the new year, for example:

1. **Check lix-its prior to placing the cage of animals back in the rack.** It makes common sense, racks are mechanical devices and devices of all kinds wear out after a while—so let’s prevent animals being without water. Always check first, then place the cages back.

2. **If using water bottles and you are coming up to a week-end, replace them when they reach 50% full.** Water is cheap, lost research or an non-compliance issue will cost. Never let a bottle stay over the week-end with less than 50% water in it.

3. **Record what you do, when you do it!** It seems simple, but it continues to be an issue: If you didn’t write it down, it didn’t happen.

4. **Record removing an animal from a cage/pen.** If it says there should be three animals in the cage and there are only two, someone will want to know why.

5. **Do not forget to double check!** Sometimes mice are placed in the top of the wire bar lids for temporary holding or for a procedure. Sometimes mice, especially pups can get down between the feed pellets. If you place the lid back on the cage and the mice are not in the cage — that’s not good.

6. **DO NOT pre-charge the chamber the CO2 chamber.** The new rules are in full effect. Failure to euthanize properly is a federal reportable event!

7. **Small transport chambers are not housing devices!** The floor space in these containers is not adequate for long-term holding (The Guide for the Care and Use of Laboratory Animals). There is adequate space in the transport buckets available at DLAR for 2 adult mice for a short period of time (< 4-5 hours) But don’t forget, periods longer than 2-3 hours without feed/water may impact your studies & the health of the animals! Keep it short!

FUNDING OPPORTUNITY: GLAS APPLICATIONS NOW AVAILABLE FROM AALAS

The American Association of Laboratory Animal Science (AALAS) announces that the next application deadline for a Grant for Laboratory Animal Science (GLAS) award is February 1, 2014. Applications are sought for research projects investigating issues into refinements and evidence-based studies to support laboratory animal health and welfare. Since its inception in 2006, the GLAS program has awarded 36 research grants that added new knowledge to the field of laboratory animal science. The award categories are Standard Grants for up to $50,000 and Small Grants for up to $7,500. Because the mission of the program includes promoting collaborative efforts by the AALAS membership within the broader scientific community, the principal investigator must be an AALAS member, but co-investigators are not required to be AALAS members. There is no geographical restriction with regard to the investigators or the institution; international submissions are welcomed. Program information, including an application form and tutorial, is available at the AALAS Website (http://aalas.org/).

SPRING 2014 IACUC SEMIANNUAL SITE VISIT SCHEDULE

Listed below is the Spring 2014 IACUC semiannual site visit schedule. Please mark your calendars for your facility’s date.

- **FEBRUARY 6:** LSRC-SANDS
- **FEBRUARY 13:** GSRB2
- **FEBRUARY 20:** BRYAN; NAN DUKE; VSH CARY
- **MARCH 6:** GSRB2 ANNEX; JONES; RP 1-4; GSRB1; ENGINEERING
- **MARCH 13:** MARINE LAB
- **MARCH 20:** CARL; EYE CENTER; FARM; INDY PK
- **APRIL 3:** CCIF
- **APRIL 10:** FOSTER ST; BIO; FRENCH; CIEMAS
- **APRIL 17:** DUKE NORTH/SOUTH; GHRB
- **MAY 1:** VIVARIUM; MSRB1
- **MAY 8:** LEMUR CENTER; MSRB2; MESOCOSM
New research is showing that lizards, turtles and snakes are more intelligent than previously believed.

Humans have no exclusive claim on intelligence. Across the animal kingdom, all sorts of creatures have performed impressive intellectual feats. A bonobo named Kanzi uses an array of symbols to communicate with humans. Chaser the border collie knows the English words for more than 1,000 objects. Crows make sophisticated tools, elephants recognize themselves in the mirror, and dolphins have a rudimentary number sense. In the plethora of research over the past few decades on the cognitive capabilities of various species, lizards, turtles and snakes have been left in the back of the class. Few scientists bothered to peer into the reptile mind, and those who did were largely unimpressed.

Anoles, a tropical lizard, have a very specific method of acquiring food, striking at moving prey from above. But Manuel S. Leal, a biologist at Duke University, created a situation in which this strategy simply would not work, hiding a tasty insect larva inside a small hole and covering the hole with a tightfitting blue cap.

Two of the six lizards he tested tried to extract the treat by attacking the blue disk from above, to no avail. But the other four puzzled out new approaches. Two lizards came at the disk sideways, using their mouths to bite and lift it, while the others used their snouts as levers to pry it off the baited well.

Then Dr. Leal increased the difficulty by hiding the larvae under a new cap, this one blue and yellow. He used the solid blue disk to cover an adjacent, empty well. In tests of four lizards, two recognized the switch and learned that getting the bait now required flipping the multicolored disk instead of the blue one.

By using experiments originally designed for mammals, researchers may have been setting reptiles up for failure. For instance, scientists commonly use “aversive stimuli,” such as loud sounds and bright lights, to shape rodent behavior. But reptiles respond to many of these stimuli by freezing, thereby not performing.

Scientists may also have been asking reptiles to perform impossible tasks. Lizards do not use their legs to manipulate objects, Dr. Leal said, “so you cannot develop an experiment where you’re expecting them to unwrap a box.”

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New AAU ‘Medicine Cabinet’ Highlights NIH-Funded Discoveries

The Association of American Universities (AAU) has an interactive resource, The Medicine Cabinet, where visitors can and explore life-saving drugs and preventative treatments that owe to research funded by the NIH. These products have improved the lives of millions, are just a sample of the breakthroughs that continue to be made possible through federal support of biomedical research. The AAU Medicine Cabinet is part of the association’s “Societal Benefits- Illustrated” webpage which highlights the role of federally-funded basic research in development of inventions integral to modern life. See the next page for a static version of the interactive webpage.
The National Institutes of Health (NIH) is the largest supporter of biomedical research in the world. Its mission is to enhance health, lengthen lives, and reduce the burdens of illness and disability. Thanks in part to NIH funding, life expectancy in the United States has increased by about 30 years. NIH continues to fund research that lays the groundwork for development of drugs and treatments that improve health and save lives.

Each labeled bottle has a corresponding description on the back about how NIH played a role in the development of treatments for various diseases.

Produced by the Association of American Universities, www.aau.edu, November 2013
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<th>A—TRASTUZUMAB (HERCEPTIN)</th>
<th>B—FLUOXETINE (PROZAC)</th>
<th>C—INSULIN</th>
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<td>Basic research conducted at the University of Pennsylvania School of Medicine led to development of the drug Herceptin, which is effective in 20-30 percent of breast cancer cases and cuts the risk of recurrence by 40 percent for women whose tumors are genetically matched to this drug. This research was funded by NIH.</td>
<td>NIH-funded research led to discoveries indicating the biological roots of depression. This allowed the development of a new class of drugs, such as Prozac, that did not cause the unwanted side effects associated with earlier antidepressants. Prozac works by increasing levels of serotonin, a neurotransmitter that is thought to influence sleep, appetite, aggression, and mood.</td>
<td>Researchers learned from a study funded by NIH that rapid-acting, bioengineered human insulin could control blood sugar in Type 1 diabetics more effectively than the previously used animal-derived insulin. Further NIH-funded studies have shown that Type 2 diabetes can be delayed or even prevented through basic lifestyle interventions.</td>
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<td>D—DONEPEZIL (ARICEPT)</td>
<td>E—BUPRENORPHINE (BUPRENEX)</td>
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<td>NIH-funded research has advanced our knowledge of the mechanisms and risk factors associated with Alzheimer’s disease. This expands the number of Alzheimer’s interventions that scientists can study in the hope of developing more treatments. One such drug based on NIH-funded research is Donepezil, which treats the symptoms of Alzheimer’s.</td>
<td>NIH-funded research has revealed how drugs of abuse, such as heroin or morphine, act in the brain. This has allowed scientists to develop effective strategies for preventing addiction, as well as drugs to treat dependence on opioids such as oxycodone. Buprenorphine, in particular, treats heroin and other opiate addictions directly by enabling addicted individuals to discontinue the misuse of opioids without experiencing withdrawal symptoms. The first such treatment program in the U.S. at Columbia University had an 88 percent success rate.</td>
<td>In 1996, NIH-funded researchers discovered a class of drugs that, when used in combination with other AIDS drugs, could attack HIV in several ways, thus extending the lives of those with HIV. Collaboration between Burroughs Wellcome and NIH’s National Cancer Institute led to the screening of a new drug therapy for AIDS known as AZT. NIH researchers continue to research new drug “cocktails” to keep a patient’s infection under control, allowing infected people to live past 70. Today, NIH-funded researchers are working to develop a vaccine that would ultimately defeat AIDS.</td>
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<td>G—STATINS (E.G. LIPITOR), ASPIRIN, BETA-BLOCKERS</td>
<td>H—FLU VACCINATIONS (FLUMIST)</td>
<td>I—(TISSUE PLASMINOGEN ACTIVATOR)</td>
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<td>The NIH-funded Framingham Heart Study in the late 1940s led to development of the concept of risk factors for heart disease and to the discovery of specific risk factors. Since then, the death rate for heart disease has dropped by more than 60 percent as the understanding of those risk factors has produced more effective treatments to open up blocked arteries and minimally invasive techniques that can prevent heart attacks. Since 1977, 1.6 million lives have been saved that otherwise would have been lost to heart disease and stroke. An estimated 44 percent of the decrease in heart disease deaths from 1980 to 2000 was a result of prevention through the reduction of risk factors.</td>
<td>Influenza is a major threat to public health. Recent studies show that in a typical influenza season five to 20 percent of the United States population falls ill, more than 200,000 are hospitalized, and 36,000 die. To combat this, NIH-supported researchers have developed several new diagnostic technologies that rapidly detect influenza antibodies in human samples. NIH is also largely responsible for flu vaccinations such as Flumist, a nasal spray flu vaccine developed by researchers at the University of Michigan and elsewhere that is an alternative to flu shots. NIH-funded researchers are now close to a universal flu vaccine that could eliminate the need for annual flu shots.</td>
<td>The age-adjusted stroke mortality rate in the U.S. has dropped by 70 percent since 1950, and over six million people in the U.S. have survived a stroke. NIH-funded research is largely responsible for saving these lives. For example, in addition to studying risk factor management associated with stroke, NIH-funded researchers discovered tPA, the first and only FDA-approved treatment for acute ischemic stroke, in which blood supply to the brain is decreased. This drug reduces the risk of disability and maximizes the potential for patient recovery.</td>
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