the veterinary page
NEWS FROM THE UNIVERSITY OF FLORIDA • COLLEGE OF VETERINARY MEDICINE

UF veterinarians: Dolphin may be ideal model for the study of human cervical cancer

BY SARAH CAREY

After testing dozens of samples from marine mammals, University of Florida aquatic animal health experts say they have found the ideal model for the study of cervical cancer in people.

"We discovered that dolphins get multiple infections of papillomaviruses, which are known to be linked with cervical cancer in women," said Hendrik Nollens, D.V.M., Ph.D., a marine mammal biologist and clinical assistant professor at UF's College of Veterinary Medicine Feb. 18 at the annual meeting of the American Academy for the Advancement of Science. "Dolphins are the only species besides humans that we know of that can harbor coinfections, or infections of multiple papillomavirus types, in the genital mucosa."

There are approximately 100 types of human papillomaviruses, and multiple-type infections of up to eight HPV types have been reported in humans, he said.

"Even more surprisingly, some virus groups have shown the ability to cross the marine-terrestrial ecosystem boundary — from sea to land," Nollens said. "We have demonstrated at least one case of genetic recombination between viruses of human and marine mammals. So while it's exciting that dolphins can provide a unique window into the role of coinfection in human cervical cancer, we can't rule out that the next high risk virus, such as SARS, or West Nile, might actually come from the marine environment."

The presence of coinfections is believed to be one of the biggest risk factors for the development of cervical cancer in humans, Nollens said, although he added that there is no evidence that dolphins develop the disease.

Dr. Hendrik Nollens and his colleagues at UF's Marine Animal Disease Laboratory have embarked on a large-scale collaborative research project to catalogue previously unrecognized and emerging viruses of marine mammals, both in collections and in the wild.

"Why do people develop the disease, but dolphins don't? If we can figure out why, the human medical community might be very interested in how that information might be applied to human strategies for preventing the disease," he said

Of all creatures that inhabit the ocean, dolphins and other marine mammals are the closest relatives of humans, but scientific knowledge of infectious diseases, particularly viral diseases, affecting these animals is limited, researchers say. No animals are harmed during collection of cell and tissue samples, although some are obtained from animals that have died of natural causes in the wild.

In hopes of shedding more light on the nature, prevalence and potential of such diseases to be passed to humans, Nollens and his colleagues at UF's Marine Animal Disease Laboratory have embarked on a large-scale collaborative research project to catalogue previously unrecognized and emerging viruses of marine mammals, both in collections and in the wild.

Over a four-year period, some 1,500 blood, tissue and fecal samples taken from dolphins have been analyzed at different laboratories across the United States, Nollens said.

"Some 90 percent of what we do in the laboratory is molecular analyses," Nollens said. "Because of advances in molecular medicine since January 2006, we've found more than 40 new viruses in dolphins alone. When the last textbook came out in 2003, only 19 were noted."

All viruses found in the laboratory and suspected of having pathogenic potential are further evaluated to assess the impact each virus could have on the health of individual dolphins, he added. The potential impact on collection animals as well as free-ranging dolphin populations is assessed, with information then used to generate guidelines for disease outbreak management and prevention strategies.

Since 2006, Dr. Hendrik Nollens and his colleagues at UF's Marine Animal Disease Laboratory have discovered more than 40 new viruses in dolphins alone. The work was part of a large-scale collaborative research project to catalogue previously unrecognized and emerging viruses of marine mammals, both in collections and in the wild.

"This process helps us understand disease and disease prevention," Nollens said, adding that for more than a decade, scientists have been looking for cures to human diseases, including cancer, among marine invertebrates.

"Maybe there will be a similar story with dolphinpapilloma viruses and prevention of cervical cancer in humans," he said. "It wouldn't be the first time we've come up with useful information from looking at marine animals."

Teri Rowles, D.V.M., Ph.D., director of the National Oceanic and Atmospheric Administration's Marine Mammal Health and Stranding Response Program, added, "The discovery of new infectious diseases and viruses in marine mammals is important for conservation as well as for scientific understanding of the connections between our oceans and ourselves."

"This work allows us to be better stewards of healthy oceans and coasts, healthy marine mammal populations and healthy people," Rowles said.

Story coverage includes NPR interview

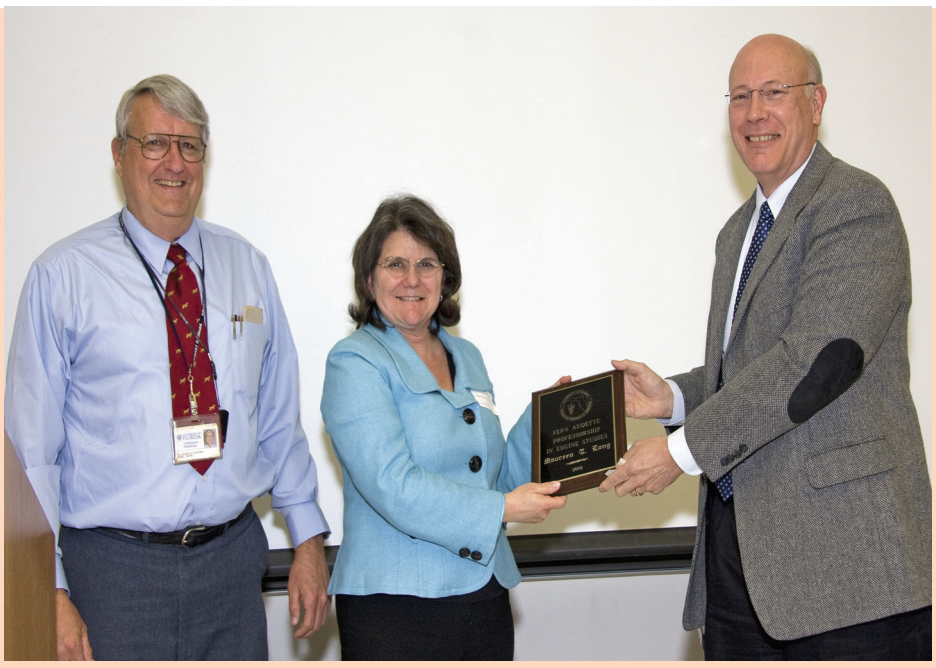
NPR's Science Friday with Ira Flatow featured Dr. Hendrik Nollens, clinical assistant professor with UF's Aquatic Animal Health Program, and Dr. Stephanie Venn-Watson of the National Marine Mammal Foundation in a discussion about dolphins as a model of human health.

Check out the transcript of the interview here, and click on the embedded link to listen to the radio podcast:

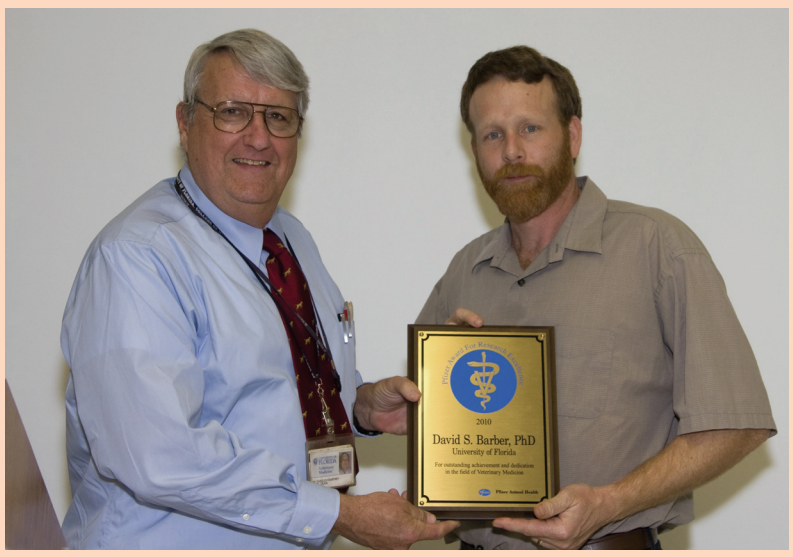
http://www.npr.org/templates/story/story.php?storyId=123892172&ft=2&f=510221

Photos from Phi Zeta Research Emphasis Day, Feb. 8, 2010

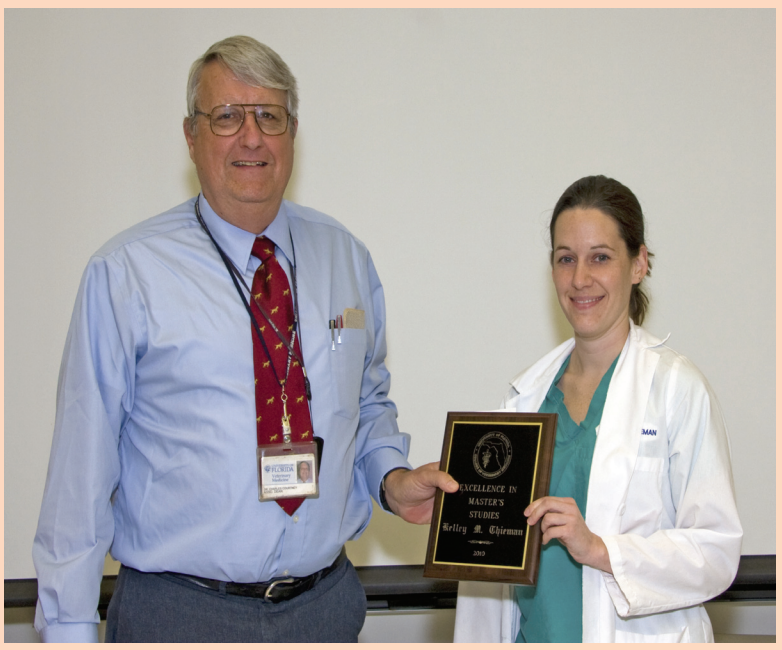
Photos by Mark Hoffenberg



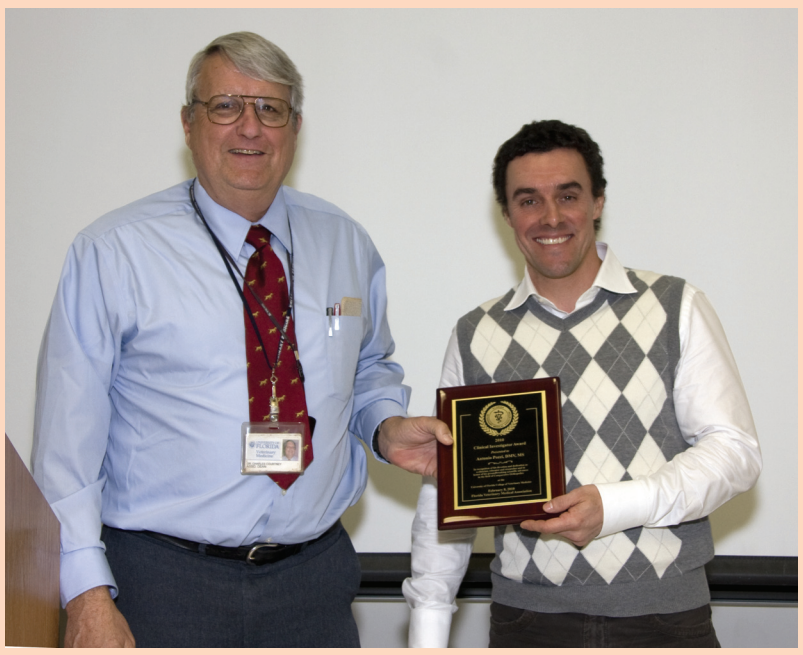
Dr. Charles Courtney with Dr. Maureen Long, recipient of the new Fern Audette Professorship, and Dr. John Dame.



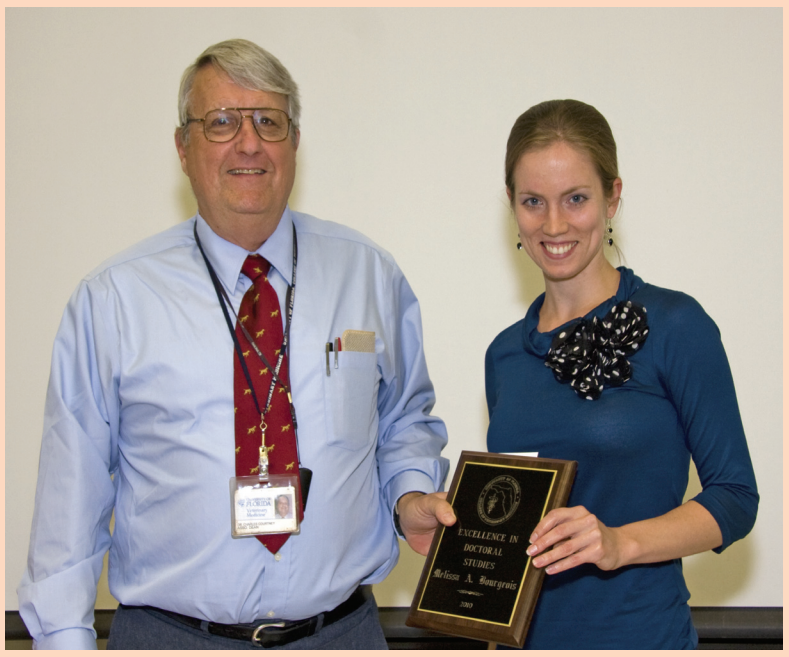
Dr. Charles Courtney and Dr. David Barber, winner of the Pfizer Animal Health Award for Research Excellence.



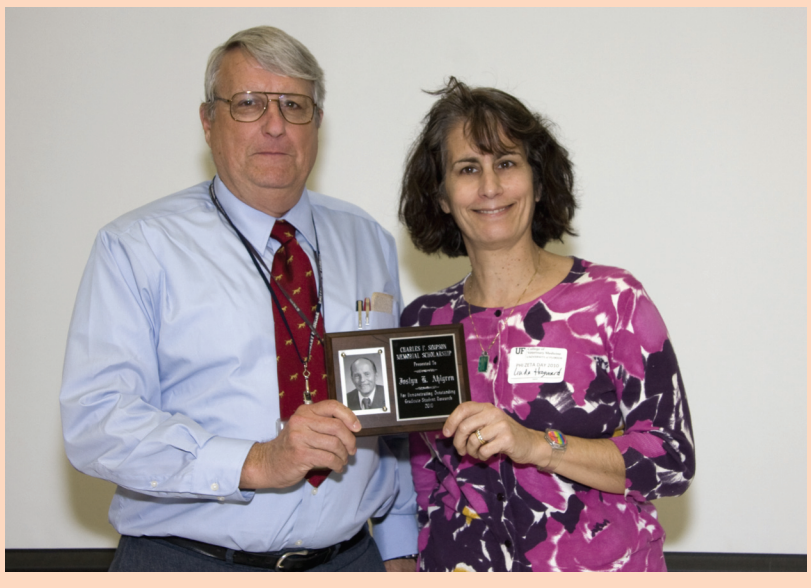
Dr. Charles Courtney and Dr. Kelley Thieman, winner of the Excellence in Master's Studies Award.



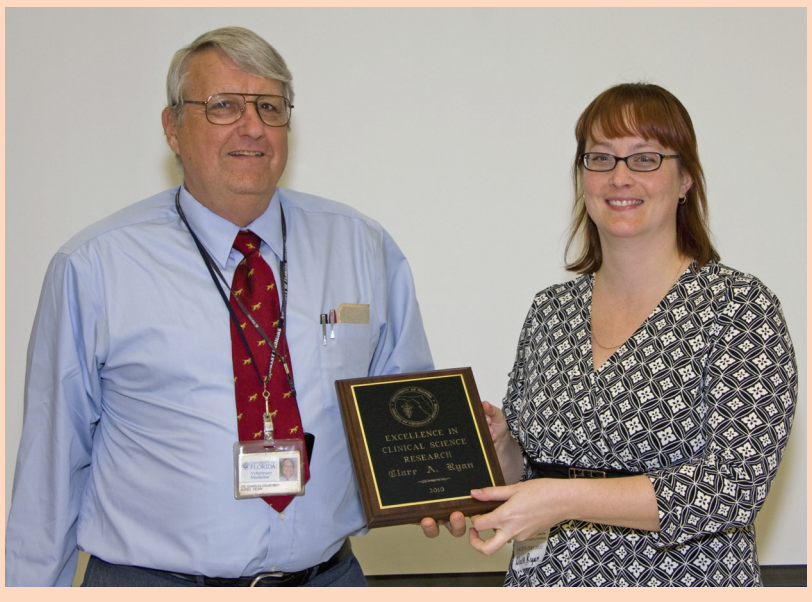
Dr. Charles Courtney and Dr. Antonio Pozzi, winner of the FVMA Clinical Investigator Award.



Dr. Charles Courtney and Dr. Melissa Bourgeois, winner of the Excellence in Doctoral Studies Award.



Dr. Charles Courtney and Dr. Linda Hayward, who accepted awards for both Dr. Carie Reynolds (Excellence in Basic Science Award) and Dr. Joslyn Ahlgren (Charles F. Simpson Memorial Scholarship.)



Dr. Charles Courtney and Dr. Clare Ryan, winner of the Excellence in Clinical Science Research Award.

Phi Zeta Research Emphasis Day at UF CVM honors achievement at many levels

2010 Graduate student awards:

Charles F. Simpson Memorial Scholarship: (Plaque and $500) - Dr. Joslyn Ahlgren
The recipient of this award ideally is in an area identified with Dr. Simpson - animal pathology, with special emphasis on mehatoprotozoan/cardiovascular related diseases or hypertension, but other areas of research are also considered.

Ahlgren performed her doctoral dissertation under the supervision of Dr. Linda Hayward in the department of physiological sciences. Her work evaluated for the first time the effects of regular, long-term voluntary exercise on the heart and lung response to severe hemorrhage. The outcomes of her studies showed that exercise alters the response to severe blood loss and are the first to demonstrate the role of opiods in the brain in the shock associated with bleeding.

She is now on faculty as a lecturer in UF's department of applied physiology and kinesiology at UF, where she teaches anatomy/physiology to undergraduates, but is also learning new research techniques related to exercise-induced changes in the blood vessels.

Excellence in Master's Studies: (Plaque and $100) - Dr. Kelley Thieman
This award recognizes excellent scholarship of a CVM graduate student either nearing completion or having completed a master's degree within the past year.

Thieman is currently pursuing an M.S. degree concurrently with residency training in small animal surgery. Her thesis research involves the mechanics of injury and repair in the knee joint, for which she received awards at the annual meetings of the Veterinary Orthopedics Society and the American College of Veterinary Surgeons.

Excellence in Doctoral Studies (Plaque and $100) - Dr. Melissa Bourgeois
This award recognizes excellent scholarship of a CVM graduate student either nearing completion or having completed a Ph.D. degree within the past year.

Bourgeois is pursuing her Ph.D. under the supervision of Dr. Maureen Long in the department of infectious diseases and pathology. Her main interest is infectious diseases, and she has developed outstanding skills working with disease-causing organisms of public health and zoonotic importance.

Her dissertation research investigated mosquito-borne virus infectious in the horse, a natural host, in a model where she helped to reproduce clinical West Nile virus disease. Independently, Bourgeois perfected the technique for the horse and sequenced the equine brain's response to West Nile infection and the normal brain's. After analyzing and categorizing results, she created an equine brain chip by selecting 44,000 genes for investigating the hypothesis that there are families of genes whose expression changes in a consistent manner during WNV infectious, disease and recovery from infection.

Presently she is determining how different genes are turned on in various regions of the brain of diseased and nondiseased horses experimentally challenged with WNV. She plans to use this data to develop a new method to predict disease survival from WNV.

Excellence in Clinical Science Research: (Plaque and $100) - Dr. Clare Ryan
This award recognizes excellence in scholarship of a CVM graduate student either nearing completion or having completed a graduate degree within the past year that involves a research topic having significant clinical relevance.

Ryan's dissertation research, conducted under the supervision of Dr. Steeve Giguere, formerly on faculty in the department of large animal clinical sciences, focused on comparing the immune responses of foals to that of adult horses and also investigated regulation of cytokineimmune responses in newborn foals. Cytokines are substances secreted by immune cells that act as messengers in immune system communication. Additional work has investigated strategies which attempt to modify the foals' unique immune system in order to prevent Rhodococcus equi pneumonia.

Excellence in Basic Science Research: (Plaque and $100) - Dr. Carie Reynolds
This award recognized excellent scholarship of a CVM graduate student either nearing completion or having completed a graduate degree within the past year that involves a research topic in basic science.

Reynolds completed her doctoral dissertation under the supervision of Dr. Linda Hayward in the department of physiological sciences. Her work evaluated the impact of nicotine exposure prior to birth on sleep vs. wake behavior, as a model of sudden infant death syndrome using the young rat as a model.

Her research identified for the first time a sex dependent (males only) alteration following nicotine exposure. She presently is conducting postdoctoral training at George Washington University, investigating the impact of nicotine exposure in the brain.

2010 Faculty awards:

C.E. Cornelius Young Investigator Award: (Plaque and $500) - Dr. Heather Wamsley
This award is open to faculty at the rank of assistant and those at the rank of associate for two years or less as of Oct. 1, for their contribution to an area of biomedical research.

Wamsley, an assistant professor of clinical pathology in the department of physiological sciences, has conducted research about a new and highly sensitive method to detect both Anaplasma marginale and Anaplasma phagocytophilum (an emerging tick-borne infectious agent of humans) in infected tissues. The method uses a combination of molecular and microscopic approaches to detect infection that has not previously been applied to disease organisms. She also has been involved in developing new methods of diagnosis of Anaplasma and is investigating the possibility of growing animal infective forms of Anaplasma marginale in tissue culture.

FVMA Clinical Investigator Award: (Plaque and $500) - Dr. Antonio Pozzi
This award recognizes the outstanding contributions to the advancement of knowledge in an area of clinical veterinary medicine.

Pozzi, an assistant professor of surgery in the department of small animal clinical sciences, has established himself as an international authority in small animal orthopedic surgery. His work on injury in the dog knee has put his name at the forefront of individuals that come to mind when this problems is discussed. He is also one of the leading individuals with regard to minimally invasive fracture repair and was the driving force in establishing the Collaborative Orthopedics and Biomechanics Laboratory here at the CVM.

Pfizer Award for Research Excellence (Plaque and $1,000) - Dr. David Barber
This award is intended to acknowledge the outstanding contributions of an established investigator to the advancement of knowledge in an area of biomedical research.

Barber, an associate professor in the department of physiological sciences, has achieved national and international recognition for his work on the toxicity of metallic nanomaterials in aquatic organisms. His use of nanotechnology for aquatic toxicity research has resulted in grant funding, peer-reviewed publications, invited research presentations and national committee participation. Currently he is funded as a PI or Co-PI by five federal extramural grants. He successfully assembled a collaborative research team within the department, college and UF for investigating the fundamental mechanisms of toxicity in aquatic species. His research record provides clear evidence of a strong program focused on basic investigations of toxins in the aquatic environment.

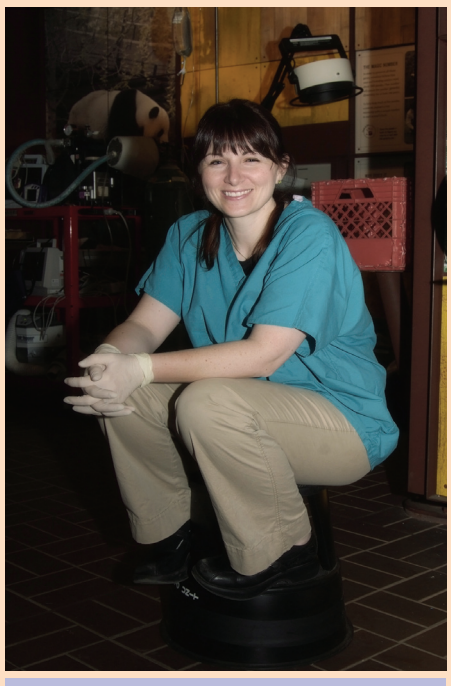
Fern Audette Professorship in Equine Studies - Dr. Maureen Long
This is a new professorship of one-year duration that may be renewed to the incumbent for additional years or transferred to a new recipient after one year. The professorship includes a plaque and a research grant to the recipient to support research in one of the following fields: equine reproduction, neonatology, equine protozoal myeloencephalitism (EPM) and ophthalmology.

Long was recognized for her research on disease organisms infecting the brain and nervous system of horses.

DVM, graduate student and resident competition winners

l) Best graduate student platform presentation: TIE: *Marc Rumpler and Dr. Melissa Bourgeois*
**Bourgeois: "Gene Expression Analysis During West Nile Virus Disease, Infection and Recovery"*
** Rumpler: "A Selective and Sensitive LC/MS/MS Method for Detection, Identification and Quantification of Glycopyrrolate in Horse Urine"*
2) Best graduate student poster presentation:
Alexis Morris: "Nitrate -- a Goitrogenic Compound in Juvenile White-spotted Bamboo Sharks (Chiloscyllium Plagiosum)"
3) Best veterinary student platform presentation
Small Animal:
Robin McIntyre: "Developmental Uterine Anomalies in Cats and Dogs Undergoing Elective Ovariohysterectomy"
4) Best veterinary student poster presentation:
Small Animal:
Rachel Siebert: "Radiographic Quantitative Assessment of Cranial Tibial Subluxation Before and After Tibial Plateau Leveling Osteotomy"
Basic Science:
Susan Vaughn: "Topographical Organization of the Facial Nucleus in the Florida Manatee"
Large Animal Surgery:
Ashley Hamilton: "The role of COX-1 and COX-2 during ischemia and restitution of equine colonic mucosa."
Large Animal Medicine:
Lisa Futz: "Treatment of Neonatal Foals with Immunostimulants Enhances Phagocytic Infection with Rhodococcus equi"
5) Best resident platform presentation:
Wildlife and Pathology:
Dr. Kenneth Conley, "Histopathological Investigation of post-treatment Vitamin A depleted African Form Nesting Frogs."
Small Animal:
TIE: Dr. Mandi Schmidt and Dr. Brian DiGangi
Schmidt: "Combined Cutting Balloon and High Pressure Balloon Valvuloplasty for Dogs with Severe Subaortic Stenosis"
DiGangi: "Pregnancy Detection in Cats Using a Commercially Available Relaxin Test"
Large Animal:
Dr. Mark Dunbar, "Anaplasma marginale in cattle of Puerto Rico: Prevalence, geographic distribution and diagnostic accuracy of detection methods"

Zoo medicine resident offers unique expertise in giant panda reproduction



Dr. Copper Aitken-Palmer

During day-to-day clinics at the UF CVM, Dr. Copper Aitken-Palmer, a second-year zoological medicine resident, might see rabbits, bats, tigers, snakes, birds or even giraffes. But an animal she'll never see as a patient in Gainesville is one Aitken-Palmer is nationally known for her expertise in – the giant panda.

"Prior to this residency, all day, every day, it was pandas," she said.

Aitken-Palmer is one of only a handful of veterinarians in the U.S. with expertise in giant panda reproductive physiology.

It's a niche she fell into when she began her Ph.D. work at the University of Maryland's Department of Animal and Avian Sciences and the Smithsonian's National Zoological Park back in 2003, focusing on panda reproduction.

As part of her research, Aitken-Palmer spent six months of the year in China each year for four years, working with a panda breeding center and making many contacts there. She also spent time at the National Zoo in Washington and helped with a semen collection effort involving pandas at the San Diego Zoo.

Now Aitken-Palmer finds herself in demand when zoological parks that possess the rare animals face complicated issues relating to their breeding.

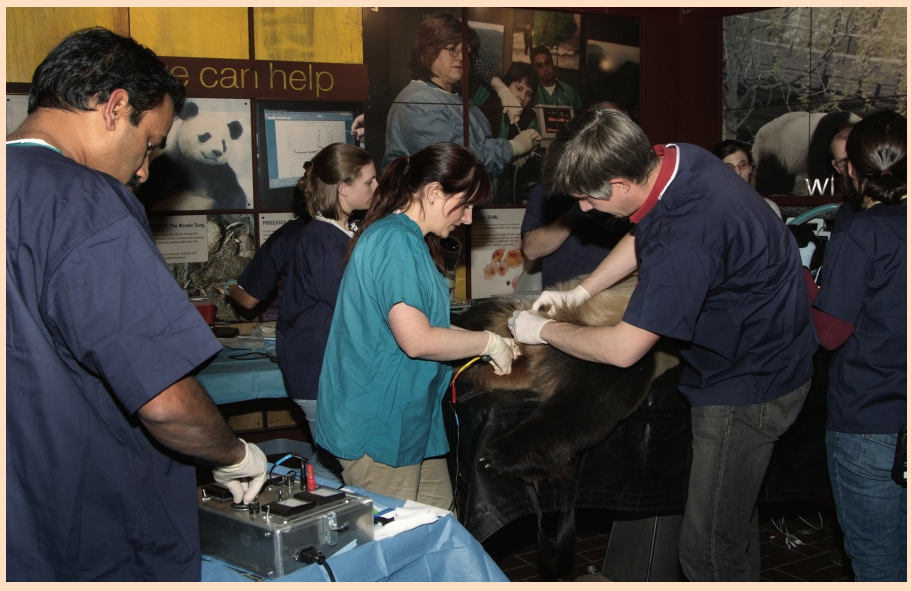
In January, when the Smithsonian National Zoological Park's giant panda couple — Tian Tian (tee-YEN tee-YEN), the male, and Mei Xiang (may-SHONG), the female, entered breeding season early, Aitken-Palmer was invited by park veterinarians to assist. Aitken-Palmer visited the National Zoo for five days that month and also may travel to another zoological park in March or April on a similar mission.

"Copper helped to monitor the breeding behavior and participated in semen collection, as well as in the artificial insemination," wrote Dr. Steven Montford, acting director of the National Zoo, in a letter thanking Aitken-Palmer's administrators for allowing her to help. "Due to her experience in giant panda reproduction and gamete biology, Copper's participation was critical to the success of the different procedures. She placed her personal plans and goals aside for several days to serve the National Zoo and has been invaluable to the panda team."

She added that once her residency at UF is completed, she may or may not return to panda work exclusively.

"Here I see all kinds of animals, and it broadens my expertise," Aitken-Palmer said. "That's why I came to UF – to broaden my training. I do enjoy the reproduction side of things, and interest in that area is growing at zoos."

In the United States, pandas can only be found at the zoos in Washington D. C. and Atlanta, as well as in Memphis and San Diego.

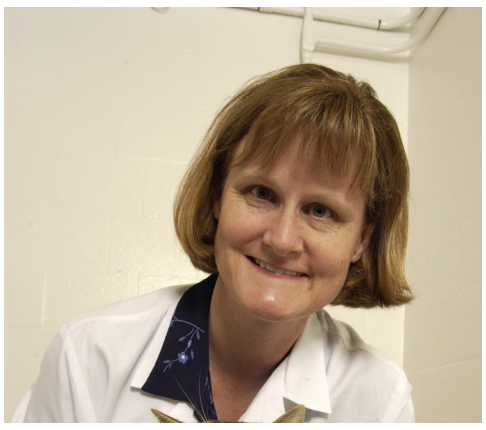


Dr. Copper Aitken-Palmer, center, assists Dr. Steven Monfort, right, acting director of the Smithsonian National Zoological Park, with efforts to artificially inseminate a giant panda in January.
(Photo courtesy of the Smithsonian National Zoological Park)

UF veterinarians confirm presence of distemper in local wildlife, warn of threat to dogs

University of Florida veterinarians report that canine distemper virus is on the increase in local wildlife, meaning unvaccinated pet dogs and shelter populations are at greater risk for contracting the disease.

Veterinarians from Alachua County Animal Control and UF collected swabs from the eyes and noses of five raccoons and one fox, then submitted those samples to a diagnostic lab to be screened for a variety of respiratory diseases.



Dr. Julie Levy

"All of these samples came back positive for canine distemper," said Julie Levy, D.V.M., Ph.D., director of the Maddie's Shelter Medicine Program at UF's College of Veterinary Medicine.

"This worries us because the disease is quite contagious, and once a dog is infected with the virus, there is no effective treatment. More than 50 percent of the dogs that contract canine distemper will eventually die from it," Levy said, adding that frequently the disease is initially diagnosed in shelter populations, and then later found in wildlife nearby or in the community.

Although no dogs have yet been reported with the illness, the spike in wildlife cases is a red flag and a reminder that only three years ago, more than 600 dogs in Alachua County died from a distemper outbreak.

"Infected raccoons are a frequent source of spread to susceptible dogs," Levy said. "When infected dogs are brought into intensive dog housing facilities, such as animal shelters, the disease can spread throughout the facility, especially among the more vulnerable populations, such as puppies."

Hundreds of dog died recently in Orange County, Brevard County and Pasco County due to distemper outbreaks in those areas.

> "The best thing anyone with a dog can do is make sure their pet's vaccinations are kept up to date. If your dog has not been vaccinated against canine distemper, call your veterinarian to schedule that appointment now."
>
> — *Dr. Julie Levy*

"If there is any good news, it is that the vaccine to prevent canine distemper is extremely effective," Levy said. "The best thing anyone with a dog can do is make sure their pet's vaccinations are kept up to date. If your dog has not been vaccinated against canine distemper, call your veterinarian to schedule that appointment now."

Alachua County Animal Services Director David Flagler said that usually the shelter receives only a handful of calls relating to sick wildlife, but that such calls had increased dramatically in the past three months.

"We have such a close relationship with the UF veterinary college that whenever we have anything unusual, we look at it as an opportunity for their shelter program to become involved," Flagler said. "In this case, UF was tracking distemper cases in other counties, and wanted to help us verify that what we suspected was true."

At a time when many of Florida's animal shelters have been hit hard with budget cuts, Maddie's Fund has provided funding to allow UF's program to help out whenever disease threatens homeless pets. Since the program started at UF in 2008, it has become a resource for shelters to use for assistance in programs ranging from infectious disease control to vaccination protocols and management strategies.

"Shelters contact us almost daily with questions about infectious disease control," said UF's Dr. Cynda Crawford, who manages the shelter consultation service. "If we can't help by phone or email, we'll often make a trip to the shelter to assess the situation and to perform diagnostic testing. When we can't sort out the problem, we'll call in the experts from pathology and microbiology to help."

In addition, UF veterinary students visit the shelter weekly to help care for the animals and to learn first-hand how shelters operate.

For more information about distemper virus infection, go to www.ufsheltermedicine.com

The Veterinary Page is the UF College of Veterinary Medicine's monthly electronic internal newsletter. Please send stories to Sarah Carey at careysk@vetmed.ufl.edu.