Fourth-year veterinary student Jennifer Reese begins the morning reviewing case notes for today’s necropsies. The first case is an alpaca. There will also be two horses, a cat and a large frog. Other animals this week have included an iguana, snake and hawk.

While the class of 2007 will have a comprehensive veterinary education, Ms. Reese, with her special interest in equine surgery and lameness, has chosen to hone her veterinary education in the equine track.

She and five classmates are in the second week of their pathology rotation. They are learning, says Reese, how to evaluate postmortem cases, sample tissues appropriately, observe, measure and assess, and further investigate when disease is suspected.

“No one else in the world has this. It’s revolutionized the way we teach.”

Reese joins the others at the conference table for student rounds with Professor Dennis Wilson and pathology resident Alejandro Garcia.

As Dr. Wilson maneuvers a histology slide on the microscope, the image is digitized and beamed across the room. He says, “I’m so impressed by the stunning quality of this projection system!”

The projected image is nearly as sharp and tonally accurate as the image on the computer monitor, even at higher magnifications.

Continued on page 3


Following voter approval of California Proposition 1D last November, the school is now in line to receive $4.5 million this year and move to the next phase of building Veterinary Medicine III B—an essential part of the plan to modernize and expand school facilities.

Vet Med III B will provide 55 faculty members with the sophisticated laboratory resources needed to conduct 21st century research in basic and applied clinical science.

“Vet Med III B is needed to meet requirements set forth by the AVMA Council on Education in its 1998 accreditation review and to meet National Institute of Health facilities standards,” says Dean Bennie Osburn.

“We cannot leave California behind. The school needs to remain a leader in furthering scientific knowledge.”

“We cannot leave California behind. The school needs to remain a leader in furthering scientific knowledge and curricular development—to maintain the highest standards of veterinary education.”

UC Davis is the leader among the nation’s 27 other veterinary institutions in the number of peer-reviewed scientific research papers published annually.

Last year extramural research funding awarded to the UC Davis School of Veterinary Medicine faculty rose 44 percent to $96 million. Yet some faculty members are forced to turn away grants.

Continued on page 2
Vet Med III B Challenge
Continued from page 1

due to insufficient or technically inadequate laboratory facilities.

Vet Med III B will dramatically increase research productivity. The school’s role in keeping California at the forefront in advancing animal, human and environmental health is limited only by the need for facilities fully designed for the task.

The total cost of Vet Med III B is projected to be $95 million. Most of the funding will come from state, university and campus sources. Yet $12 million must come from private gifts.

“We face a significant challenge—the remaining $4.8 million must be secured within the next 16 months.”

“Fundraising for Vet Med III B began in 2005, and the school has received a conditional $5 million pledge from a private foundation. It is up to the school to raise the remaining $7 million for the pledge to be fulfilled,” says Dean Osburn.

“To date we have generated $2.2 million toward the $7 million goal, but we face a significant challenge—the remaining $4.8 million must be secured within the next 16 months.

“I have made funding for Vet Med III B the school’s number one priority,” says Dr. Osburn. “For the next 16 months, the school will be working to raise private funds to help pay for the building. The goal is to begin construction in 2008 and complete the building by 2011.

“Last year, 93 percent of private support for the school was directed to student scholarships, research programs and endowments, graduate student fellowships, equipment, and new programs. This is our time for facilities.

“It took nearly 30 years for the campus, university and state to invest in upgrading School of Veterinary Medicine facilities. We must use the $4.8 million challenge and funding opportunity to further our ability to train the next generation of biomedical scientists and educate the world’s finest veterinary professionals.”

Vet Med III A Emphasizes Interaction

Vet Med III A, a pair of buildings that will support and enhance veterinary medical education on the UC Davis campus, is nearing completion in the Health Sciences District.

The five-story tower will integrate teaching programs with clinical and diagnostic services. The openness of the facilities will foster interaction among faculty members and residents, collaborative research, and cross-training of graduate students in different laboratories.

The attached two-story structure, located across from Gladys Valley Hall and the Veterinary Medical Teaching Hospital, contains four large teaching laboratories—classrooms that can hold 80 students at a time arranged in pods of four students per workstation.

The new Vet Med III A classrooms will replace antiquated student labs in Surge III for courses in anatomic and clinical pathology, microbiology, immunology and virology. The classrooms interconnect with preparative laboratories designed in a standard benchtop configuration.

Dr. Dennis Wilson, chair of the Department of Pathology, Microbiology and Immunology, says, “The Vet Med III A pathology facility is designed to be a teaching environment with lots of space for direct interaction. Students will be able to easily follow a case originating in the clinics that is evaluated by pathology or ends up in necropsy, and talk directly with clinicians. The student laboratory classrooms are right there, and in Valley Hall we already see interactions between the first-, second- and third-year students. These classes have been separated from the clinics for 30 years.”

“The tower will integrate resident training and laboratory research, making it easy for the resident pathologist to observe and interact with academic veterinary medicine,” says Dr. Wilson. “Building an interest in academic careers is an important goal of the school.”

“We also have unique, forward-looking programs of translational research—developing new diagnostic tools with research instruments for hospital patients,” he says.

The first floor of the tower comprises a modern veterinary student teaching facility for pathology and anatomy where students on rotation in the Pathology Service will be in contact with clinicians in the Necropsy and Biopsy Services. It includes large and small animal necropsy floors and a conference room for clinical and veterinary student rounds, a separate necropsy room for infectious or zoonotic disease cases and a room for decontamination.

The second floor is dedicated to the J.D. Wheat Orthopedic Research Laboratory. Faculty in anatomy, surgery and radiology will address cellular, structural and clinical aspects of bone disease and small animal surgery.

The top three floors are dedicated to disease research. Interactive groups of pathologists, microbiologists and immunologists with common interests in various aspects of comparative veterinary disease will occupy regions of large, open laboratories, with graduate group and departmental offices at each end. In the center of each floor are shared rooms for cell culture, special equipment and controlled environments.

Continued on page 7
Investigating Pathology

Continued from page 1

He says, “No one else in the world has this. It’s revolutionized the way we teach.

“The Veterinary Medical Teaching Hospital developed an integrated hospital records system that has been Web-based for six or seven years. It includes medical records, diagnostic images and laboratory data—all ‘in house’—and pathology case records going back to 1982, with digitized photographs integrated into the data base since 2000. It’s a tremendous teaching tool.”

Once each student “has a go” at the case, the others are invited to join in.

The group begins viewing digital “Kodachromes”—color photographs of tissue samples from previous cases. As each image appears, the students are in turn “on the spot” to precisely describe the lesion, accurately discuss the morphology (including identify the species) and draw conclusions based on the evidence. Once each student “has a go” at the case, the others are invited to join in.

First up is Jennifer Reese, with a cross section of what appears to be a sheep hoof. She describes the lesion, “severe, subacute, focal, hemorrhagic…” The emphasis in case reporting is on precise language.

One of the students exclaims aloud as a “zinger” comes onscreen. It’s a not-very-pretty cross section of spinal tissue with a tumor next to a vertebral body—it’s just difficult to tell which one.

Throughout the exercise, Dr. Wilson challenges the students with questions to further their investigative skills and broaden their thinking to include multiple species. His approach is to urge the students to analyze not just the ultimate cause, but the entire process in the live animal that led to its death.

Once they’ve reviewed the set of Kodachromes, Dr. Wilson asks, “Has everyone had a chance on the hot seat?” and praises the students, “You all had very thoughtful analyses and were able to pick up very subtle lesions.”

Dr. Garcia echoes the praise and acknowledges that mastery of precise descriptive terminology can be a humbling challenge. As the morning progresses, the words “vacuolated,” “urolithiasis” and “lymphohistiocytic” will be part of the conversation.

Continued on page 7

Scholarship Recipient Makes the Most of Fourth-Year Studies

“It’s hard to sum up the fourth-year experience, because things are always changing—the rotation you’re on, the caseload that week, how close boards are, etc.,” says Jennifer Reese.

“When I’m not at school,” she says, “I’m usually studying for boards, reading up on my cases, or doing things like working on my internship applications. Board examinations are held in November and December, and internship applications are due November 30. I’ve also been working on a research project for the last year.”

Reese is a recipient of the Seli Gernhardt Scholarship awarded to a female student specializing in equine medicine.

Dr. Gernhardt was president of the Equine Medicine Club and loved horses. She lost her life in an auto accident en route to Maryland to begin veterinary practice after commencement in 1994.

Her parents, who established the scholarship endowment in 1995, add funds every year in her memory. Names of the recipients are inscribed on a plaque displayed in the hallway of the Veterinary Medical Teaching Hospital Large Animal Clinic.

Digital radiographs of a catastrophically injured alpaca spine appear on the computer monitor and are projected to the entire conference room.
Avian Flu School participants learn poultry blood sampling and shipping protocols for disease surveillance.

Avian Flu School Goes International

H5N1 highly pathogenic avian influenza (HPAI) is currently affecting parts of Asia, Africa, Europe and the Middle East. Avian flu devastates poultry flocks of large producers and individuals in poor rural communities. The disease represents an international animal health emergency.

Adequate prevention and response to H5N1 HPAI outbreaks involves training more veterinarians, public health workers, scientists, livestock producers, wildlife and zoo managers, and government officials in biosecurity, emergency management, surveillance and reporting.

The course covers preventing, detecting and responding to avian influenza outbreaks.

The flu school was launched internationally last summer following a series of pilot courses conducted at UC Davis, Texas A&M University and Morogoro, Tanzania.

The pilot courses were led by Carol Cardona, associate professor and Veterinary Medicine Extension poultry specialist; Christian Sandrock, assistant professor of pulmonary and critical care medicine and medical director of the California Preparedness Education Network; veterinarian Daniel Beltrán Alcrudo; and Wildlife Health Center analyst David Bunn. Participants included veterinary scientists from the United States, Mali, Libya, Nigeria, Senegal and Tanzania.

The four-day course, adaptable to different countries and environmental conditions, covers preventing, detecting and responding to avian influenza outbreaks. Topics include emergency communications, virus surveillance in domestic and wild birds, public health and worker safety, disinfection, diagnostic sample collection and poultry vaccination.

The National Center for Foreign Animal and Zoonotic Disease Defense (FAZD) co-sponsored curriculum development. Other partners included the Wildlife Conservation Society; Sokoine University of Agriculture, Tanzania; and University of Minnesota Cooperative Extension.

Avian Flu School manager David Bunn has discussed future training sessions with officials of the African Union, USAID, UNFAO, the Centers for Disease Control and Prevention, the World Health Organization, and veterinary programs in Malawi and Uganda.


FOOD SAFETY

TRACKING E. COLI

A $1.2 million USDA grant is supporting research to trace sources of E. coli O157:H7 in lettuce grown in the Salinas Valley.

Rob Atwill, Veterinary Medicine Extension specialist and co-principal investigator, says, “There has been much speculation that livestock or wildlife are possible sources of the E. coli O157:H7 in outbreaks in fresh produce from the Salinas Valley region. We will examine livestock and wildlife on the rangeland above the farmland, and wildlife that live near canals and on the periphery of vegetable fields on the valley floor.”

In the four-year study, crews will collect thousands of samples of domestic animal and wildlife droppings; creek, ditch and irrigation water; farm soil; and lettuce. Scientists will analyze the data to identify possible sources of E. coli O157:H7 such as cattle, feral pigs or other animals.

They will also assess the climate, landscape attributes and irrigation management practices associated with increased risk of contamination.

Study results will help growers determine strategies to prevent field contamination of vegetables and develop effective practices to improve water quality.

Certain strains of E. coli bacteria normally live in the intestines of cattle, wildlife and humans causing no harm. The O157:H7 strain, however, causes severe diarrhea and can lead to kidney damage and even death. It is unusually persistent in the environment, though pasteurization or cooking destroys the bacteria.
In September, the National Institutes of Health awarded a five-year cooperative agreement worth $23 million to a consortium of UC Davis researchers; the Children's Hospital Oakland Research Institute; and the Wellcome Trust Sanger Institute, England. The group plans to create lines of embryonic mouse stem cells in which 5,000 individual genes will be systematically turned off, or “knocked out.”

The knockout mice help scientists study the function of specific genes and produce models of cancer, obesity, diabetes, heart disease and other conditions.

The funding followed a July announcement that the NIH awarded $800,000 to UC Davis and the University of Missouri to acquire, store and distribute genetically modified mice. The UC Davis repository currently contains 13,000 strains of laboratory mice—more than any other facility in the United States. Making genetically altered mice available saves time and money for individual scientists.

Kent Lloyd, director of the UC Davis Mouse Biology Program established in 1997, predicts, “Within five years, through this and related projects around the world, scientists will have access to knockouts of all 20,000 genes of the mouse genome.” About 10,000 mouse genes are of particular value in human health research.
Private Gift Helps Set Course for SeaDoc Society

Ron and Kathleen McDowell of Eastsound, Washington, believe that scientific research is an essential tool of policymakers. They have endowed the Pacific Northwest Fund, which supports the regional director and scientist position of the SeaDoc Society.

The SeaDoc Society is a marine ecosystem health program of the Wildlife Health Center created to address the decline in marine wildlife such as seabirds, whales, and abalone, and the overall health of marine ecosystems. Its activities in the Pacific Northwest and California are under the direction of Dr. Kirsten Gilardi, who is in the early stages of extending the program to include the Baja California coastal ecosystem.

The SeaDoc Society’s Pacific Northwest Regional Director and Chief Scientist Joe Gaydos says, “The Puget Sound, Northwest Straits and Georgia Basin waters are in trouble, and that affects our health, wealth and peace of mind. We deeply appreciate the leadership that Ron and Kathy McDowell and Dean Bennie Osburn have provided in the effort to support needed research and get it into the hands of people who can use it.”

SeaDoc Society scientific expertise helped inform the Washington governor’s initiative to clean up and restore a healthy Puget Sound.

Also, using the SeaDoc model in negotiations with the U.S. Department of the Interior, the Wildlife Health Center has signed a memorandum of understanding with Yellowstone National Park and Montana State University to manage wildlife health in the park and Greater Yellowstone area.

Graduate Fellowship Honors Richard Freedland

The 2006 Richard A. Freedland Fellowship was awarded to Angelo Arias, a PhD student in the Pharmacology/Toxicology Graduate Group under the mentorship of Dr. James Angelastro in the school’s Department of Molecular Biosciences. Mr. Arias is investigating the role of a specific protein, ATF3, in glioblastoma, a type of brain cancer.

Selection of a Freedland fellow is based on how well the individual reflects Dr. Freedland’s high standards for research excellence.

Dr. Freedland, still a member of the Graduate Group in Nutrition, taught and carried out research in physiological chemistry and the dynamics of animal metabolism, including the effects of hormones, nutrition and genetics on carbohydrate and lipid metabolism.
Tributes to Special Friends

Garden features at the new Center for Companion Animal Health (CCAH) allow animal lovers to honor or memorialize special people or animals while supporting the center’s mission—to improve the health and well-being of all companion animals.

There are a variety of ways to create a memorial or tribute:

- Personalized plaques, laser-etched with a photo and dedication to a friend or pet, will become a permanent part of the Angel’s Courtyard artwork that depicts the many ways in which animals share our lives.
- Friends can inscribe a brick in Edna’s Park with a tribute when they contribute $100 or more to the CCAH. In memory of her beloved dog, Edna, Ms. Charlotte Goland of Sacramento and the CCAH created the park. It features both an agility course and a memorial brick courtyard near the CCAH clinic entrance.
- Benches in the CCAH gardens may also be inscribed with permanent dedications to special animals, their families and friends.

For more information about how you can create a lasting tribute that supports the CCAH, contact the development office at (530) 752-7024.

Beloved Beagle Engenders Support for Hemodialysis

Genny, who was the family beagle of Jeffrey Rich and Jan Miller Rich of Dallas, Texas, is leaving a legacy of love and hope for other animals needing hemodialysis services.

The Millers have contributed $50,000 and, with other friends of the school, are planning for renovation and expansion of the Hemodialysis Unit at the Veterinary Medical Teaching Hospital (VMTH).

The VMTH operates four hemodialysis machines and performs 500–600 treatments per year for companion animal patients from all over the United States.

Efforts are underway to expand the current configuration from four to seven hemodialysis stations with workspace for two to three registered veterinary technicians and a similar number of renal medicine/hemodialysis fellows to meet growing demands for the service.

For more information, contact the development office at (530) 752-7024.

Investigating Pathology

A cross section of canine tissue does not give clear indications, and Dr. Wilson says, “Oh, this is going to be a mystery case.” The lung tissue has a lot of alveolar fluid but doesn’t look particularly inflamed.

Jennifer Reese asks, “How much of this is postmortem change?” Dr. Wilson says, “Good question.” Another student consults the case notes—the dog died at home and was not euthanized, which might have caused pulmonary edema. Dr. Wilson replies, “Then this probably reflects cardiac disease. It may be secondary effects rather than the primary cause of this animal’s demise.”

The group turns to today’s cases for a look at the diagnostic data before heading to the necropsy floor.

Radiographs of the alpaca are accessed from hospital records and projected for discussion. The animal, which ran into a fence while being chased by its owner’s dogs, had a fractured spine and displaced ribs.

One of the two equine cases will be an investigation of a hind foot abscess, radiographs of which show a collapsed coffin joint. Dr. Wilson suggests adjusting the dissection protocol to include the coffin joint, and that the student, Jennifer Reese, follow the flexor tendon to find an expected rupture.

Because there are a number of large animals today, he suggests starting early and offers a strategy for efficient use of the work space. He advises the students to use a step-by-step approach to get the most information. They will have a 30-minute lunch break before regrouping to begin the necropsy procedures.

Under the mentorship of residents and hospital staff, the students will spend the afternoon physically examining their respective cases and collecting samples for further evaluation to form diagnostic conclusions.
Continuing Professional Education Calendar

2007

Behavior Medicine Club Symposium
January 14, 2007—UC Davis

Wildlife & Aquatic Medicine Club Symposium
January 27, 2007—UC Davis

Second Annual UC Davis Veterinary Diagnostic Imaging Symposium
March 24–25, 2007—Napa, CA

Avian and Exotic Medicine Club Symposium
April 21–22, 2007—UC Davis

Holistic Veterinary Medicine Club Symposium
May 6, 2007—UC Davis

Fourth Annual Veterinary Neurology Symposium
July 21–22, 2007—UC Davis

20th Annual Fall Symposium on Recent Advances in Clinical Veterinary Medicine
September 16, 2007—UC Davis

23rd Annual George H. Muller Veterinary Dermatology Seminar in Hawaii
October 31—November 7, 2007—Maui, Hawaii

Ninth Annual Veterinary Endocrinology & Internal Medicine Seminar
November 27–December 4, 2007—Kauai, Hawaii

2008

Biennial Adventure Series
July 31–August 10, 2008—Galapagos Islands

WILDLIFE HEALTH
RESEARCHERS VIEW CHEETAH FERTILITY IN NAMIBIA

Veterinarian Autumn Davidson and ultrasonographer Tomás Baker from the UC Davis School of Veterinary Medicine joined researchers from the Smithsonian Institution last summer at the Cheetah Conservation Fund International Research and Education Centre in Namibia.

The world’s largest cheetah reserve is dedicated to ensuring long-term survival of the cheetah. A small gene pool makes the species vulnerable to being wiped out by disease or other environmental threats.

Davidson and Baker examined the reserve’s female cheetahs using ultrasound and endoscopy. “We hope to identify the best time to harvest eggs from female cheetahs for in vitro fertilization and eventual transplant, and to better understand why females’ fertility declines after 8 years of age,” says Dr. Davidson.

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