

IN

SIGHT

Summer 2001

College of Veterinary Medicine
and Biomedical Sciences



Toll of Infectious Diseases Rising
Dengue Fever Poised to Strike
Malaria Spreading as Mosquito Populations Move Out

Colorado
State
University

Knowledge to Go Places

INSIGHT

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*Cover photo: Mosquitoes are the purveyors of some of the most deadly and widespread diseases known to humans. Researchers at the Arthropod-borne and Infectious Diseases Laboratory are attempting to decipher the role of the mosquito as a conduit of disease and disable it as a messenger of death.
(Photo by Bill Cotton)*

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Editor/Writer: Carol Borchert;
Photographers: Charlie Kerlee, Bill Cotton;
Production: Sandy Thode;
Production Coordinator: Margaret Taunt.
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Welcome

In this edition of *Insight*, we look at infectious diseases in the headlines today, examine the research work in progress at the College, and bring you news of the exciting developments in our laboratories that may help doctors and scientists battle these scourges.

You'll learn about the Arthropod-borne and Infectious Diseases Laboratory and the cutting-edge work researchers are doing on some of the most devastating diseases in the world. You'll get a first-hand look at a new laboratory in the College that is tackling chronic wasting disease in deer and making advances that may help us to understand similar neurological diseases in humans and other animals.

Also in this edition of *Insight*, you'll read about the "Veterinary Caucus" in the United States Senate, review the special honors given to two of our faculty members, read about a breast cancer research program, and much more. You'll also enjoy an in-depth interview with Dr. James Voss, dean of the College, who will be retiring in October.

We welcome your questions and comments on *Insight*. If you'd like to get in touch with us, please send your correspondence to:

Insight Correspondence
College of Veterinary Medicine and Biomedical Sciences
Colorado State University
Fort Collins, CO 80523-1601

You can e-mail *Insight* comments to Paul Maffey, director of development for the College, at pmaffey@cvmb.colostate.edu. We also invite you to visit us at our Web site at www.cvmb.colostate.edu. ■

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Toll of Infectious Diseases Rising as Researchers Race to Stop Them

The numbers themselves are astonishing. Each year, there are an estimated 50 to 100 million cases of dengue fever, with 2.5 billion at risk and several hundred thousand cases of dengue hemorrhagic fever globally. Malaria infects 300 to 500 million people each year, killing approximately 2 million annually; half of these deaths are children under 5 years of age. Globally, 2.5 billion people are at risk of contracting malaria. West Nile virus and yellow fever account for thousands more illnesses and deaths. The global cost of arthropod-borne infectious diseases reaches into the millions. And these diseases show no signs of slowing down. In fact, they are on the move.

“Scientists around the world have worked with these diseases for decades,” said Dr. Ken Olson, acting director of the Arthropod-borne and Infectious Diseases Laboratory (AIDL) at Colorado State University. “We have made progress, but the diseases seem to be moving a little faster than we are.”

Early efforts to control diseases spread by mosquitoes focused on controlling the mosquitoes. An arsenal of chemical weaponry was unleashed and initially seemed to slow the spread of these infectious diseases. Over time though, mosquitoes developed resistance to the chemicals while their surrounding environments suffered the deleterious effects. Development and delivery of improved treatment has been hampered by lack of funds in developing countries and the rural nature of their societies. Vaccination programs continue, but so far have failed to produce vaccines that provide comprehensive coverage. Where effective vaccines have been developed – such as for yellow fever – cost, delivery, and refrigeration requirements often present insurmountable problems. Unfortunately, vaccines for two of the

most important vector-borne diseases, malaria and dengue, are proving very difficult to develop.

“The focus of our research here is mosquitoes and the role they play in dis-



Research associate Emily Traventy at work in the Arthropod-borne and Infectious Diseases Laboratory.

ease transmission,” said Dr. Olson. “The mosquito is the major go-between in these diseases. When the female takes a blood meal from a person infected with a particular virus, it then acts as a vector for that virus. We are very interested in what is happening to that virus when the mosquito is its host. Mosquito-borne viruses such as dengue viruses replicate in gut cells following intake of a blood meal and travel through the mosquito to the salivary gland where they replicate again and are then transmitted to the next person. Understanding the physiology of all those interactions, and perhaps

These diseases show no signs of slowing down. In fact, they are on the move.

finding places where we can break down the relationship, will help us in the fight against these devastating diseases.”

Most diseases spread by such tropical mosquitoes as *Aedes aegypti* and species of *Anopheles* once were considered to be a threat only to subtropical regions in Africa, South and Central America, Asia, and island nations. These diseases now are threatening closer to home. Last year, outbreaks of West Nile virus in New York and dengue fever in northern Mexico forced Americans to realize the very real threat of mosquito-borne illnesses.

“I think many Americans have often thought that this is a problem for other countries, but not for us,” said Dr. Olson. “The fact of the matter is, it’s our problem too. For example, *Aedes aegypti*, a historically African mosquito, has now spread worldwide and is quite adept at adapting to the local human population. The tiger mosquito, *Aedes albopictus*, came to us from the Far East, most likely in shiploads of tires that had collected stagnant water.”

Focusing on the mosquito as the vector of these diseases seems to be a natural place to fight arthropod-borne infectious diseases. Scientists hope that mosquitoes may provide the weak link in a chain that they might be able to break, to disrupt the cycle of infection. At AIDL, researchers have a number of research projects underway, including:

- Replication and transmission of the viruses that cause dengue fever
- Disease resistance in mosquitoes, looking particularly at transgenic mosquitoes
- Viaticum studies to examine gene transfer between populations
- Looking at how the Lacrosse virus

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Infectious Diseases

continued from page 3



Cynthia Meredith checks on mosquito development at AIDL's insectory.

- overwinters in the mosquito egg
- A study site in Yucatan, Mexico, to examine migratory birds for West Nile virus
- A study in Mexico to assess risk factors for dengue fever
- Study sites in Colorado to determine risk factors for human infection with sin nombre virus
- Programs to determine how viruses such as vesicular stomatitis and blue-tongue viruses, which are very important veterinary diseases in Colorado, are transmitted and maintained by their insect vectors

Dr. Olson said the best hopes for control now lie in biocontrol measures based on viruses and the development of new vaccines. A strong vaccine effort aimed at dengue fever currently is underway. Long-term goals include genetic control measures.

“We are in the process now of developing more elegant solutions, but it will take some time,” said Dr. Olson. “For the past 10 to 15 years we have had a collaborative effort to transform the mosquito, trying to use its DNA against the viruses to which it provides safe harbor. We have such a great core of people here, all looking at the big picture of what we are trying to accomplish. And when you look at the numbers of people worldwide affected by mosquito-born diseases, what we are trying to do is a pretty amazing thing, but I think we’ll get there.” ■

Growing Mosquitoes Serious Business at AIDL

There’s a place in Fort Collins where tens of thousands of mosquitoes live and breed and the people who work there actually like it that way. Of course, these

aren’t your ordinary, run-of-the-mill annoying mosquitoes that leave you with red welts and itchy skin. These mosquitoes are the carriers of some of the most widespread and devastating diseases in developing countries, and they are in Fort Collins to help researchers better comprehend the role mosquitoes play in the lifecycle of viruses and better understand the transmission of arthropod-borne infectious diseases.

The mosquito colony at the Arthropod-borne and Infectious Diseases Laboratory (AIDL) hosts tropical species of mosquitoes such as *Aedes aegypti* and *Anopheles* species that spread diseases like dengue fever and malaria. Raising the mosquitoes is time and labor intensive, requiring precise environmental controls as well as specialized habitats for each stage of development.

The cycle starts when female mosquitoes are given a blood meal.

They then mate and lay eggs on liners. The eggs hatch in water and reduced oxygen and come out in the first star larval stage. After the fourth stage, the larvae pupate and are placed in cups of water. Once development is complete, the adult mosquitoes are put into the large insectory. The mosquitoes are used in a variety of research projects, including studies exploring genetic manipulation and basic research that is attempting to define viral activity within the mosquito.

The risk of mosquitoes escaping from the insectory is miniscule, said Dr. Ken Olson, acting director of AIDL, because of the many extraordinary safeguards in place. The mosquito colony is located in a biocontainment building, specially constructed for this purpose. If a mosquito did manage to escape the confines of the insectory and the building, it would have a difficult, if not impossible, time surviving Colorado’s inhospitable climate. That climate is one of the reasons Colorado is an ideal location for an insectory raising tropical mosquitoes – dry and hot, cold and windy – not fit for any self-respecting non-native mosquito. ■



Current Research Programs Underway at the AIDL

The Arthropod-borne and Infectious Diseases Laboratory has several major areas of research targeted at a variety of mosquito-borne diseases. Each research team has a lead investigator, listed below, and an area of research expertise.

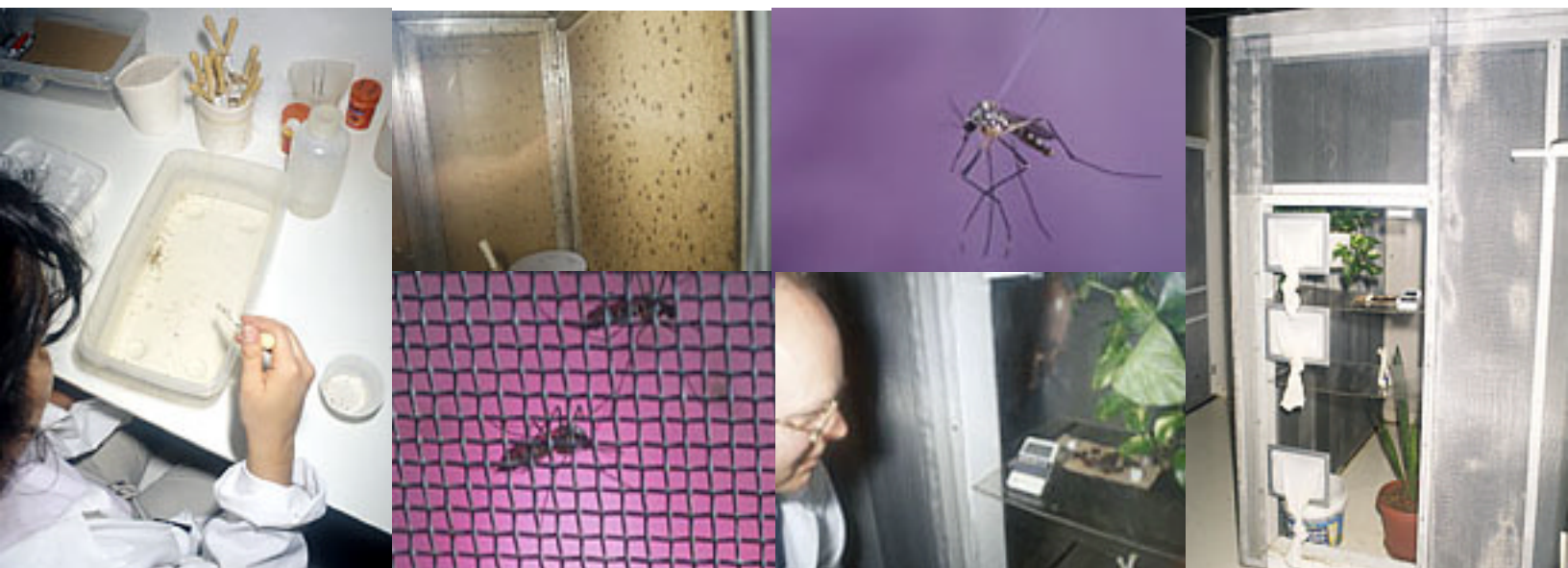
Dr. Barry Beaty

The major research emphasis of Dr. Beaty's team is the study of arbovirus-vector interactions. These studies include the determination of the evolutionary potential of arboviruses in vectors and discovery of gene structure-biological function relationships that contribute to preferred vector-vertebrate cycles. Evolutionary events are studied to determine their epidemic significance and to define molecular determinants of arbovirus cycle integrity. Molecular transformation of arthropod genomes and other molecular genetic approaches are being used to study the molecular biology of the vector.

insect hosts. They are investigating the molecular mechanisms by which bunyavirus replication is regulated in persistently infected mosquitoes, using laboratory mosquito colonies. They are investigating a new hypothesis for the overwintering mechanism of blue-tongue virus. Another exciting discovery is that expression in mosquito salivary glands of certain regions of the RNA genome of flaviviruses renders the mosquitoes incapable of virus transmission. Each of these lines of investigation is being actively pursued by Dr. Blair's team.

Dr. Ken Olson

A major research goal of Dr. Olson's team is to identify molecular strategies for interfering with the replication of human pathogens in mosquito vectors. They currently are using recombinant mosquito-borne Sindbis viruses to transduce mosquitoes with anti-pathogen RNAs or proteins and stop transmission of



Dr. William Black

Dr. Black's team is using molecular genetic markers to map genes in the mosquito *Aedes aegypti* that condition dengue virus susceptibility, and genes in the mosquito *Aedes triseriatus* that control transovarial transmission of LaCrosse encephalitis virus. They also have been developing cDNA markers and the theoretical basis for performing population genomics analyses in *A. aegypti*. They hope to use their work to identify genes and nucleotide substitution that confer midgut susceptibility of *A. aegypti* to the dengue virus.

Dr. Carol Blair

Dr. Blair's team is particularly interested in the interactions of flaviviruses, bunyaviruses, and orbiviruses with their

the pathogen. They also are developing transgenic mosquitoes that are pathogen resistant. Other important goals of Dr. Olson's team are to use and develop new methodologies to study the molecular epidemiology of dengue viruses and to identify and characterize important virus-vector interactions.

Dr. Jonathan Carlson and Dr. Erica Suchman

The major effort in Dr. Carlson and Dr. Suchman's laboratory is the development of mosquito densovirus as tools for fighting mosquito-borne diseases. These are parvoviruses of mosquitoes, and they show promise for both mosquito control applications and as vectors for introducing genes of interest into mosquitoes. ■

Prion-Related Diseases Making News, Raising Questions

If the scientific community were writing a whodunit mystery thriller, it couldn't come up with a better villain than the prion. Insidious, practically indestructible, and deadly, the prion is implicated in some of the most sinister diseases known to humans and animals.

Bovine spongiform encephalopathy (BSE) in cattle, chronic wasting disease (CWD) in deer and elk, and Creutzfeldt-Jakob disease in humans (CJD), are all fatal brain diseases known as transmissible spongiform encephalopathies, or TSEs. These diseases are not caused by a virus or bacteria, but are believed to be caused by normal protein molecules that become infectious when folded into abnormal shapes. These abnormal proteins, called prions, fly below the immune system's radar and can survive in the harshest of conditions. The link between prions and TSEs seems almost certain, though researchers are only just beginning to understand the pathology of these diseases and how prions wreak havoc in the brain.

Chronic Wasting Disease

Chronic wasting disease is one of the four predominant TSEs that affect animals. The other three are BSE in cattle, transmissible mink encephalopathy in mink, and scrapie in sheep. Several other TSEs – including CJD and variant CJD (associated with the most recent BSE outbreak in Great Britain) – affect humans. The abnormal proteins damage the brain and central nervous system, destroying healthy tissue. TSEs are always fatal. Researchers at Colorado State University are helping to advance study of TSEs with a comprehensive study of CWD in deer and elk.

Larimer County, where the University is located, is ground



A mule deer showing symptoms of chronic wasting disease. Photo courtesy of Dr. Christina Sigurdson, research fellow in the Department of Pathology.

zero for CWD. First recognized in 1967 and later reported by Dr. Beth Williams and Dr. Stuart Young at Colorado State, the disease now afflicts up to 15 percent of the local deer population, the highest incidence in the world. It is found only in small numbers outside of northeastern Colorado and southeastern Wyoming. Recently, the Colorado Division of Wildlife put in place a culling operation to reduce herd sizes in hopes of damping the spread of the disease. CWD-infected elk have been discovered on game ranches in several states and in Canada.

To help answer the many questions surrounding chronic wasting disease and other TSEs, the National Institutes of Health has provided funding to a research team at the College of Veterinary Medi-

Transmissible spongiform encephalopathies (TSEs) arise spontaneously in humans and animals.

These diseases are not caused by a virus or bacteria, but are believed to be caused by normal protein molecules that become infectious when folded into abnormal shapes.

cine and Biomedical Sciences, the Colorado Division of Wildlife (CDOW), and the University of Kentucky (UK). The Colorado State group, headed by Dr. Edward Hoover, a professor in the Department of Pathology, is conducting studies in collaboration with Dr. Mike Miller (CDOW) and Dr. Glenn Telling (UK) on how CWD is transmitted, how the agent causes disease, and how it may be detected in live deer. The researchers hope the work will advance studies into other TSEs as well.

“Right now, we are still trying to understand some of the basic characteristics of prions and the diseases these abnormal proteins cause,” said Dr. Hoover. “This study will enable us to shed light on CWD, its transmission, and the epidemiology of TSEs.”

The research team is studying how prions are transmitted, how prions make their way into and through the body (as well as how are they stopped), and how to recognize TSEs in live animals (right now, examination of brain tissue from dead animals is the only sure diagnosis of CWD). Another major component of the UK research project is the development of a transgenic mouse to carry the deer PrP gene that produces the normal deer prion protein in mouse cells.

“I think it's important to note that abnormal proteins as a cause of TSEs are still under investigation,” said Dr. Hoover. “We still do not fully understand the cause and development of these diseases.”

Researchers do know a few key factors about CWD, but there are more questions than answers. Because deer are not cannibalistic, the prions do not spread by one eating the remains of another, nor do wild deer consume manufactured ruminant feed. This is the

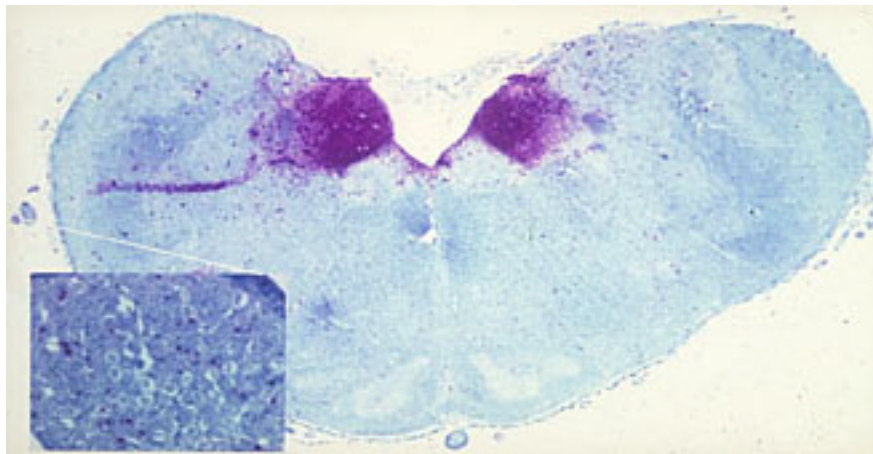
suspected contaminant route that caused the outbreak of BSE in Great Britain in the late 1980s. The remains of infected cattle were ground up into feed to boost protein content and given to other cattle, potentially infecting huge numbers of animals. By the time the epidemic had subsided, BSE had killed nearly 200,000 British and European cattle. The variant CJD in humans, caused by eating infected beef, has been diagnosed in 100 victims, and it is certain that millions have been exposed.

Just how chronic wasting disease spreads through wild deer and elk populations is a mystery. Deer may come in contact with prions by grazing where an infected animal also has grazed, through doe-to-fawn transmission, contaminated water, or contaminated feces.

Dr. Hoover said researchers do know that prions are extremely hardy. Methods that destroy viruses and bacteria – such as boiling, ultraviolet radiation, or soaking in formaldehyde – have little effect on prions. Miller and colleagues have on-going studies to examine the risk of cattle becoming infected with CWD. It's unknown whether CWD can be transmitted to humans. Meanwhile, Colorado hunters are urged to have their harvested deer tested for chronic wasting disease. As a precaution, the Colorado Division of Wildlife currently is recommending that hunters not eat the meat of infected animals.

“We know that in some cases, prions have crossed over the species barrier,” said Dr. Hoover. “Right now we can't say for certain that won't happen with chronic wasting disease. With the creation of the Prion Research Laboratory, we hope to begin to understand and answer many of these questions that surround transmissible spongiform encephalopathies.”

In this mystery thriller, a likely suspect already has been identified. Now, medical detectives just need to figure out a way to stop it. ■



Immunostain of a brain stem from a naturally infected deer with chronic wasting disease. The dark stained areas mark the abnormal prion protein.

Transmissible Spongiform Encephalopathies

Creutzfeldt-Jakob Disease and variant Creutzfeldt-Jakob Disease

Creutzfeldt-Jakob disease begins slowly with deteriorating memory and depression. The disease progresses rapidly into dementia, uncontrollable jerking of the muscles, body systems shutting down, and finally death. The incidence of classic CJD is 1 case per 1 million in the United States, rarely occurring in people under 30 (less than 5 cases per billion per year). By contrast, more than half of the 100 variant CJD victims in Great Britain were under 30 years old. It's believed variant CJD is caused by ingestion of infected beef, milk, or cheese. Variant CJD has not been diagnosed in the United States.

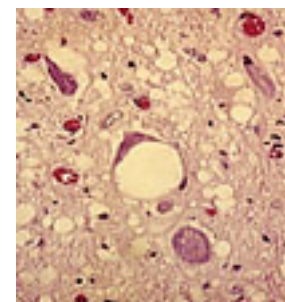
Bovine Spongiform Encephalopathy

Bovine spongiform encephalopathy is a progressive neurological disorder in cattle. The disease destroys the central nervous system and brain. Cattle lose weight, have difficulty with balance, and act skittish. In cattle as in humans, BSE is believed to be caused by an abnormal protein called a prion. Close to 200,000 cattle were diagnosed with BSE in the

U.K. in an unprecedented prion epidemic.

Chronic Wasting Disease

Chronic wasting disease afflicts deer and elk mostly in northeastern Colorado and southeastern Wyoming. Cases also have been found in captive elk and one wild deer in Canada. The disease destroys the brains of infected deer and elk, causing the animals to become emaciated, display abnormal behavior, salivate profusely, and die. Larimer County, Colorado, and southeastern Wyoming have the highest levels of the disease worldwide. Chronic wasting disease also is believed to be caused by prion infection. ■



Brain tissue showing the classic sponge-like appearance associated with chronic wasting disease.

Foot-and-Mouth Disease Always a Threat to Nation's Livestock

This spring, Europe was very much in the news with stories about an outbreak of foot-and-mouth disease (FMD), a centuries-old illness that can devastate livestock operations. As the disease deci-



Cattle at a Colorado State research ranch don't have to worry about foot-and-mouth disease yet. The outbreak in the United Kingdom hasn't made its way stateside, but officials are ever vigilant.

mated farms across the United Kingdom and threatened the European continent, Americans were left to wonder if their agricultural industry was in danger, too.

"The risk of introduction of FMD into the United States today is greater than it has been in the past, mainly because of the increased travel of people and animals throughout the world," said Dr. Paul Morley, an assistant professor in the Department of Environmental Health and director of the biosecurity program at the Veterinary Teaching Hospital. "The very nature of FMD makes it easy to transmit and increases the risk that it will be carried across borders and into uninfected populations."

FMD is caused by an aphovirus, similar to the rhinoviruses that cause colds. It is, said Dr. Morley, the most contagious of any disease he knows. The virus can survive for weeks in soil and months in meat, is extremely hardy in milk, and can remain viable in nasal mucus for several days. As few as 10 virus

can infect a pig, which can then shed 100 million infectious doses of virus per day. Transmission of the virus is very efficient, as it can be ingested orally or inhaled into the respiratory system. The virus can travel for miles on the wind (120 miles is the greatest distance recorded for an infection jump) and infect large populations before it is discovered.

Foot-and-mouth disease is found mainly in cloven-hooved animals such as domestic goats, sheep, cattle, and swine and deer, bison, buffalo, and other cervids. The disease also can infect hedgehogs, rats, and guinea pigs. Dr. Morley said the disease could infect all hooved animals we have in the United States with the exception of horses.

The disease is rarely transmissible to humans.

The virus causes blistering of the mouths and feet of infected animals, as well as eventual lameness, loss of appetite, and wasting. It can cause cardiac infection in young animals, which often die from weight loss because it is too painful to eat or drink. Herds infected with FMD are quickly destroyed to prevent spread of the disease. Since the outbreak of FMD in February, close to 1 million animals have been destroyed in the United Kingdom and Europe.

"The key to controlling FMD is early diagnosis of the disease, aggressive culling, and effective

restriction of the movements of animals, people, and equipment," said Dr. Morley. "Vaccination is not a prevention and only can be used in the United States with USDA approval to control an active outbreak. Vaccination acts somewhat like a firebreak in a forest fire. You can create a zone around areas with active infection, basically burning up the fuel the fire needs to keep going, temper the outbreak, and then cull those vaccinated animals. It's important to destroy vaccinated animals because even though they may have immunity to the disease, they can still be carriers."

The United States has not had an outbreak of FMD since 1929, but emergency response teams are in place at the state and federal level should the disease show up here. Other FMD-free zones include Central America, Canada, Australia, and Antarctica. Restrictions on the importation of animals and animal products from countries with FMD help to protect the United States from the disease. American travelers also need to be aware of FMD risks, and how to abate them, when traveling to parts of the world where FMD is endemic.

FMD is not related to bovine spongiform encephalopathy (BSE), nor is it caused by prions. Confusion between the two diseases is common because recent outbreaks of both were based in the United Kingdom. ■

"The key to controlling FMD is early diagnosis of the disease, aggressive culling, and effective restriction of the movements of animals, people, and equipment. Vaccination is not a prevention and only can be used in the United States with USDA approval to control an active outbreak."

Breast Cancer Researchers Looking for Clues in Hidden Twists of DNA

For each species, including humans, it is their exclusive genetic makeup that makes each individual unique. In humans, genetics accounts for hair color, eye color, general personality traits and, as researchers are discovering, susceptibility to disease. At the Department of Radiological Health Sciences, researchers are just beginning to understand how slight variations in the genome may make certain individuals more sensitive to radiation exposure and hamper the ability of their cells to repair damage, translating perhaps into a higher risk for breast cancer.

“Everybody has some variation in their DNA sequence (called polymorphisms), base differences that once in a while can have an impact on the function of the gene,” said Dr. Bob Ullrich, a professor and director of the department’s Program of Research and Scholarly Excellence in Cancer Research. Dr. Ullrich also is director of research at the Animal Cancer Center. “These polymorphisms, while small, may be part of the reason for individual response and susceptibility differences to radiation therapy or other exposures to radiation such as mammography and dental X-rays.”

Genetic links between BRCA1 and BRCA2 susceptibility genes for breast cancer have been established, but these gene-linked breast cancers are rare. The majority of women with breast cancer show no obvious genetic risk factor. Studies of subtle polymorphisms may provide part of the answer to why some women are at a higher risk for developing breast cancer. Dr. Ullrich’s laboratory is focusing on a polymorphism in a DNA repair gene, the Prkdc gene, that encodes a protein called DNAPKcs that repairs double-stranded breaks in DNA – breaks easily caused by radiation exposure. Dr. Ullrich also is trying to identify other polymorphisms that may increase, or reduce cancer risk.

Genetic links between BRCA1 and BRCA2 susceptibility genes for breast cancer have been established, but these gene-linked breast cancers are rare. The majority of women with breast cancer show no obvious genetic risk factor. Studies of subtle polymorphisms may provide part of the answer to why some women are at a higher risk for developing breast cancer.

“Long term, if we can determine whether these polymorphisms play a role in cancer development, we can do a better job of sorting out what the risks are for people after exposure and identify people who may be at a higher risk,” said Dr. Ullrich, whose work is supported by the National Cancer Institute. “Knowing these risk factors can allow physicians to adjust radiation treatment and enable people to make better life choices such as altering lifestyles and reducing unnecessary exposures. On the flip side, people who don’t have these polymorphisms can be treated more aggressively with radiation therapy allowing for a better cure rate.”

In addition to his work in polymorphisms, Dr. Ullrich also is looking at age-related radiation exposure and development of breast cancer later in life. Early findings show that young girls and teens exposed to radiation (for cancer therapy or in the cases of atomic weapons at Hiroshima and Nagasaki) have a much higher risk of breast cancer later

in life. Women exposed later in life, including exposure to mammograms, show no increased risk. Dr. Ullrich’s research team is examining the matrix of cells that support mammary cells and how the environment within those cells, especially as it relates to hormonal changes, affects the risk of developing breast cancer.

“It’s very exciting to be doing this work at Colorado State University,” said Dr. Ullrich, who joined the Colorado State faculty in January from the University of Texas Medical Branch in Radiation Oncology. “We have access to great students – radiation biology has such a rich tradition here – and the College is very good at producing postgraduate DVMs. It’s so rewarding to work with the veterinary students. They are extremely dedicated to their research and bring unique qualities to their work.”

In addition to his laboratory work in the Department of Radiological Health Sciences, Dr. Ullrich’s research team is working closely with veterinarians and researchers at the Animal Cancer Center. The ACC provides a large population of patients that supply valuable information and may help to develop models for use in cancer research. Companion animals share the environments of their humans and develop many of the same cancers, especially as animal and human populations age. The ACC also provides access to the Veterinary Teaching Hospital’s diagnostic imaging equipment and other equipment enabling advanced cancer research.

One day, Dr. Ullrich and his team hope to unravel some of the mystery surrounding the effect of genetics on an individual’s susceptibility to cancer. And while the hope is that these genetic polymorphisms may hold the answer to some of the causes of cancer, they also may hold the keys to prevention and perhaps even a cure. ■

Dr. James L. Voss Announces Retirement

Dr. James L. Voss, dean of the College of Veterinary Medicine and Biomedical Sciences at Colorado State University since 1986, has announced his intention to retire effective October 1, 2001. The University recently appointed a committee to select his successor and expects to make an announcement on the new dean by mid-summer.

"Jim Voss has been a great leader for Colorado State not only because of his professional knowledge and his skill as an administrator, but also because he's a man of his word who speaks plainly, keeps a sense of humor during tense times, and constantly challenges his colleagues and the institution to move forward in significant ways" said Dr. Albert C. Yates, president. "The stature of the University's veterinary medicine program can be largely attributed to the vision, leadership, and commitment of Dr. Jim Voss."

During Dr. Voss' tenure as dean, the College of Veterinary Medicine and Biomedical Sciences saw extraordinary progress and change. Today, the Professional Veterinary Medical Program consistently ranks in the top three nationwide, both in terms of the quality of its programs, and in terms of federal support for research, and the College's research centers have shown explosive growth. During the past 10 years, research dollars at the College rose from \$5 million annually to \$34 million in funded research.

"A large part of this success comes from an early focus on six areas of research and teaching excellence at the

College," said Dr. Gordon Niswender, director of the Animal Reproduction and Biotechnology Laboratory, and a University Distinguished Professor. "When Dr. Voss began his term as dean, the College was forming these research affinity groups. Dr. Voss hired faculty to support these programs and, over the years, they grew to be centers of research and scholarly excellence not only at Colorado State University, but nationally and internationally as well."

These research and teaching focal areas include the Professional Veterinary Medical Program, animal reproduc-



Dr. James Voss

tion and biotechnology, cancer biology, environmental health sciences, infectious diseases, and neurobiology.

In addition to establishing internationally acclaimed research programs,

under Dr. Voss' leadership the faculty and staff at the College led the way in enhancing and developing veterinary education to meet changing professional demands. The College created veterinary tracks in small and large animal medicine, dramatically changed the use of animals in teaching and research to address concerns about animal welfare, developed course work to meet the increasingly non-medical demands placed upon veterinarians by clients, and reinvented core courses to challenge students while helping them to succeed academically as well as professionally. Dr. Voss also helped to create and build a new program in equine sciences, a massive effort bringing together veterinarians, faculty in the agricultural sciences, and researchers from across departmental boundaries. Today, the Equine Sciences Program is recognized internationally as one of the finest equine teaching and research programs in the world.

During Dr. Voss' tenure, the College also saw a dramatic increase in capital construction including the state-of-the-art Molecular and Radiological Biosciences Building, B.W. Pickett Equine Center, Animal Reproduction and Biotechnology Laboratory, a new biosafety level-three laboratory for research in infectious diseases, and numerous expansions of existing facilities. Most recently, the College completed fundraising for a \$9.5 million addition to the Veterinary Teaching Hospital to house the Animal Cancer Center and the Argus Institute for Families and Veterinary Medicine. Construction on the new wing is slated to begin this spring.

Dr. Voss has long played an important role in the growth and success of the College. He began his career at Colorado State in 1958 as an instructor in the Department of Clinical Sciences, after graduating from the University with his Doctor of Veterinary Medicine degree. He also received his Bachelor of Science degree from the University, as well as

"Dr. Voss is an outspoken individual who tells it like it is, and people respect that. Professionally, he has a national reputation as one of the finest veterinary deans to ever serve in that position at any of the veterinary schools."

his Master of Science. He worked as an equine ambulatory clinician, conducting farm calls with students and attending to horses and livestock. During that time, he also made the personal connections that later would help him garner political and popular support for the progressive programs that were to be initiated at the College.

“As an ambulatory clinician, Dr. Voss had a reputation as a real western equine practitioner who thoroughly enjoyed his work in the field, developing the College’s equine practice. His sense of humor and ability to work with students made him many lifetime friends,” said Dr. Anthony Knight, head of the Department of Clinical Sciences and a longtime colleague of Dr. Voss. “His dedication to providing quality service to the equine industry and the livestock industry in general provided him a thorough understanding of Colorado’s livestock industry, and he had a good sense of the legislative process.”

Dr. Voss progressed from an instructor and equine practitioner to assistant professor and associate professor, coordinator of large animal medicine in the Department of Clinical Sciences, and professor and assistant head of that department and eventually took over leadership of clinical sciences in 1975. When the time came to appoint a new dean, Dr. Voss had the support of the Colorado State faculty and leaders in the Colorado agricultural industry.

“I think some people were surprised by his natural leadership skills, but he’s the type of person who just relates well to everyone – whether students or the person cleaning the stalls or elected officials,” said Dr. Knight. “He also had a strong vision for the future of the College and had the philosophy of hiring the best people to do the job and then allowing them to do it.”

One of the first challenges Dr. Voss faced as dean was to shore up the crumbling foundation of WICHE (Western Interstate Commission for Higher Education) support for the College. At the

time, application numbers were dropping, and the nine state WICHE members were questioning the value of a regional veterinary school when cheaper options were available. Dr. Voss was instrumental in drafting a new WICHE contract, garnering support from all member states and from a Colorado state legislature that was slow to back any new spending. With the WICHE alliance firmly in place once again, the College could set upon a path to excellence.

“Dr. Voss is an outspoken individual who tells it like it is, and people respect that,” said Dr. Knight. “Professionally, he has a national reputation as one of the finest veterinary deans to ever serve in that position at any of the veterinary schools. I feel very fortunate to have had the honor and pleasure of serving as department head during Dr. Voss’ tenure.”

During his career, Dr. Voss played a leadership role in a number of veterinary organizations. He was president of the Colorado Veterinary Medical Association, in addition to many other positions; he served as president of the American Association of Equine Practitioners, and president of the Association of American Veterinary Colleges and held several committee positions with the American Veterinary Medical Association including

that organization’s council on education. Dr. Voss also continued working in veterinary research, even during his tenure as dean, and today still serves the equine industry as an expert in equine reproduction, particularly stallion reproductive physiology.

“My retirement from the College of Veterinary Medicine and Biomedical Sciences is bittersweet, as I am sure retirement is for so many people,” Dr. Voss said. “I am very proud of the College and what so many have worked so hard to build here. It would be nice to stick around and be a part of whatever the future holds for us. I also truly enjoy working with the faculty, staff, and students here and will miss my friends and colleagues. But I am looking forward to spending more time with my family, dabbling a bit in consulting, traveling with my wife Kathleen, and rediscovering the beauty of my home state, Colorado.”

The veterinary profession, and the College of Veterinary Medicine and Biomedical Sciences, will miss the leadership that Dr. Voss has provided for so long. He leaves behind, however, a lasting legacy in veterinary medicine and biomedical sciences upon which his successors can build. ■



Dr. James Voss (holding the reins) at the 1977 groundbreaking of the Veterinary Teaching Hospital.

Looking to the Future: Challenges, Opportunities Lie Ahead

Editor's Note: In this discussion with Dr. James Voss, we ask the retiring dean to look ahead on what the future holds for the College, the veterinary profession, and the biomedical sciences.

Q: How do you think the future looks for veterinary medicine?

Dr. Voss: The future is very optimistic for veterinary medicine. The profession certainly is in transition, moving toward improved customer service and one-stop shopping. We are seeing larger practices with specialists where clients and patients can get everything they need. These types of practices will flourish because they generate more business, provide more complicated services, and have less overhead.

I think we'll see the one- and two-person practices go the way of the Mom-and-Pop drug stores of the 1960s. Instead, we'll have fewer practices with more veterinary staff. The exception to this will be the rural community, which will always have the veterinary equivalent of a family practitioner.

Q: How is veterinary medical education changing to meet the changing face of veterinary practice?

Dr. Voss: The challenge is to keep up with training for the future versus training the way we always have. We did go through a curriculum change several years ago that allowed students to choose different tracks. We are offering more specialties such as oncology and numerous others. So some changes are in place. But we need to revamp teaching methods to increase the amount of time students are engaged in actually doing, rather than just observing. If we don't engage the students, we can't teach them. We have to teach business skills and veterinary practice management skills, help

students address the changing needs of clients, and graduate veterinarians who are ready to practice in a variety of settings.

Q: What challenges face the Veterinary Teaching Hospital?

Dr. Voss: Space is critical for our future success. We are building and expanding the existing hospital, but we soon will need a new hospital. The old building simply will not be able to accommodate expected growth in programs, nor provide the basic wiring, plumbing, venting, and other services necessary for ever-more technologically advanced laboratories and treatment centers. On the positive side, we have an incredible clinical faculty that will lead the PVM program and VTH into the future and address these problems in a proactive manner.

Q: What about the College's other branch, the biomedical sciences?

Dr. Voss: The College is well-placed to continue to excel in research and education in the biomedical sciences. For a number of years, we have put an emphasis on biomedical sciences through hiring, equipment purchases, and capital construction. This investment has placed us in line for support from state and federal agencies to research existing and emerging diseases of humans and animals.

I think as the earth gets figuratively smaller, emerging diseases will become more and more of an issue, requiring many of the research resources we have in place now. The College will continue to be involved in basic scientific research as well as development of diagnostics, treatments and cures, and new tools for controlling the spread of disease. We can see these efforts already in place with diseases such as West Nile virus and dengue fever. These were once thought to be diseases of tropical Third World coun-

tries, but are now present in North America. Our work in tuberculosis, cancer, viral diseases, retroviruses, and arthropod-borne infectious diseases has given Colorado State and the College an international reputation of which we are very proud, so we will continue to expand upon the work we have begun.

Q: What challenges face a continued expansion of the biomedical sciences program?

Dr. Voss: A big one of course is funding. It's a challenge to get money for equipment, people, and space – state support in this area is limited – so we have to realize we can't be everything to everybody. We have worked and will continue to work toward building interdisciplinary teams that have a specific focus. Two examples of this in the College today are the Mycobacteria Research Laboratories and the Arthropod-borne and Infectious Diseases Laboratory. These two programs, and others at the College, are programs of international acclaim and excellence that are conducting vital research in their fields.

Another challenge we face is finding the best scientists. Researchers are not changing as fast as the world is, and we are continually looking to hire new talent with new ideas, more current knowledge of technology, and more advanced experience in their fields. A constant infusion of new talent is required if we are to keep our research programs viable and if we are to continue to provide leadership in the field of biomedical sciences. I'd also like to see changes in the tenure system. I know it's controversial, but I'd like to see universities move away from tenure and toward performance-based retention. If you're doing your job, you don't have anything to worry about. As it is now, it's hard to soar when you've got anchors attached to your wings.

Departmental Reorganization Underway

Q. Where will the funding emphasis lie for biomedical research?

Dr. Voss: The National Institutes of Health is a big player in where the future of biomedical sciences lies. The NIH is well-funded compared to entitlement funds like those through the United States Department of Agriculture. Funding priorities for the NIH cover the gamut from genetic and infectious diseases, to diseases such as Alzheimers, diabetes, and cerebral palsy. What we're seeing is more and more emphasis on cellular and molecular sciences, the development of genomics, and the mechanisms of disease. This is a very exciting time in biomedical sciences with new technologies and equipment making possible things that were once in the realm of fairy tales. One day, gene-based cures may be as common as penicillin. Proteomics, the study of protein functions as they relate to disease, also is up and coming, and is an area in which we are interested.

Q. What does the future hold for you?

Dr. Voss: Well, I'm not a homebody, but I have an awful lot of tasks to catch up on. I will probably revise the text for *Equine Reproduction*, and do a bit of equine work. I might actually have to get a computer too. I'm also looking forward to spending more time with my family. Retirement is such an interesting notion these days. I guess to me it means doing more of what has been put aside for so many years, while having a little bit more control of your time. I've certainly had a wonderful career at Colorado State. I've made lifelong friends, traveled around the world, been exposed to the best and brightest minds, and have had the privilege of working alongside some truly incredible individuals. ■

The execution of sweeping changes at the College of Veterinary Medicine and Biomedical Sciences is underway, with the new Department of Biomedical Sciences the first to come on line.

The College-wide reorganization is designed to address areas of concern related to: changes in the undergraduate teaching program at the College and University levels; workload accountability; reduced participation in the Professional Veterinary Medical Program by WICHE state partners; the number of open department head positions; the significant number of potential faculty retirements in the near future; and the

needs met and we are more efficient, but it will take some time to get there."

The fundamental difference in the new organization will be facility-based management and alignment of teams based on research and teaching responsibilities as opposed to departmental lines. Each building will have its own manager/faculty leader and support staff to provide services to faculty and students in that building. Department heads will operate as coordinators and delegators, allowing others to assume positions of responsibility while reducing bureaucracy. Schwarz said service is the new watchword, whether to students, faculty,

The structure reflects the College's four principle programmatic areas of biomedical sciences, clinical applications of veterinary medicine, environmental health issues, and infectious diseases.

dynamic and team-oriented nature of today's research environment.

The most visible change at the College is the collapsing of seven departments into four. The new departments are Biomedical Sciences; Clinical Sciences; Environmental and Radiological Health Sciences; and Microbiology, Immunology, and Pathology. The structure reflects the College's four principle programmatic areas of biomedical sciences, clinical applications of veterinary medicine, environmental health issues, and infectious diseases.

"This is a complicated process," said Joe Schwarz, associate dean and coordinator of the reorganization efforts. "We have to analyze everything, then restructure units from the ground up. Faculty and staff, all of whom have had a tremendous amount of input into this process, are onboard but still have concerns about how the changes will affect them. I hope that two years down the road, people can say they have their

visitors, or staff. No one will lose his or her job because of the restructuring, but individuals may be put into new positions that best fit their strengths.

Creating each department is a four-step process, as directed within the new College Code developed to guide the changes. First, Schwarz conducts an organization analysis of current departments, including strengths and weaknesses. Based on the preliminary analysis, recommendations are made based on the desired architecture of the new department. After extensive review, appropriate changes are made to the recommendations and then the reorganization plan is implemented. The Department of Biomedical Sciences is now in the implementation phase with other departments to follow. Dr. Charles Miller is the interim chair of Biomedical Sciences. He is assisted by Dr. Ray Whalen, Dr. Gordon Niswender, and Dr. Alan Tucker. Schwarz said that by July 2002, allowing four to five months for each department, all departments will be merged. ■

Veterinary Coalition Sets Up Practice in U.S. Senate



Senator Wayne Allard

When Wags the Dog (owned by Idaho Sen. Larry Craig) races through the corridors of the U.S. Senate, he makes a beeline for Sen. Wayne Allard's office. When Sen. John Ensign is in the chair on the floor of the U.S. Senate, it doesn't take long for Sen. Robert Byrd (D-WV) to launch into a speech praising the attributes of his dog. What Sen. Ensign and Sen. Allard share and bring to the U.S. Senate is something that transgresses party lines (Wags is, after all, a Republican while Byrd's dog is a Democrat). Both men hold degrees in veterinary medicine from Colorado State University and share a love of animals that Republicans and Democrats alike appreciate.

Sen. Allard, a 1968 graduate of the Professional Veterinary Medical Program at the College of Veterinary Medicine and Biomedical Sciences, has held public office since 1983, when he served in the Colorado State Senate representing Larimer and Weld Counties. In 1990, Sen. Allard was elected to the U.S. House of Representatives from Colorado's Fourth Congressional District and in 1996 was elected to the United States Senate. From 1970 to 1990, Sen. Allard also owned and operated Allard Animal Hospital in Loveland, Colorado.

Sen. Ensign graduated from the Professional Veterinary Medical Program in 1985, returning to his home state of Nevada to open and operate the first 24-hour animal hospital in Las Vegas. In

The Veterinary Caucus brings heart, soul, intelligence and integrity to the often beleaguered halls of the U.S. Senate.



Senator John Ensign

1994, Sen. Ensign was elected to the U.S. House of Representatives, working to reform welfare, to protect Nevada from nuclear dumping, and to pass legislation covering mammograms for Medicare recipients. In 1998, Sen. Ensign ran for the U.S. Senate but was narrowly defeated. In 2000, Sen. Ensign ran a successful race for the U.S. Senate, replacing Sen. Richard Bryan.

"I am really excited to have John here in the Senate with me," said Sen. Allard. "We call ourselves the Veterinary Caucus and really just have a little bit of fun with it. But I think our backgrounds bring with them a serious side too. We have a unique perspective, and I know my background in the sciences has helped me understand and deal with some difficult issues. I serve on the Senate Armed Services Committee, and, during discussions about weapons of mass destruction, my training in physics, chemistry, and bacteriology enables me to bring a different viewpoint to the table. Talking about bacteriological and chemical agents, as well as nuclear weapons, is more meaningful when you can fully understand the ramifications of the use of these weapons."

Sen. Allard also serves on the Senate Banking, Housing, and Urban Affairs Committee, the Senate Budget Committee, and the Senate Agriculture Committee. In addition, Sen. Allard works with the Biotechnology Caucus, focusing on

biological research and issues important to veterinary medicine.

Sen. Ensign serves on the Senate Commerce, Science, and Transportation Committee; the Small Business Committee; the Special Committee on Aging; and the Senate Banking, Housing and Urban Affairs Committee. He spends his workweek in Washington, D.C., and his weekends in Las Vegas with his family. He still is owner of South Shores Animal Hospital in Las Vegas. Sen. Ensign said his skills as a veterinarian, especially nonmedical skills, help him successfully achieve his goals in political office.

"I think one of the most important things I learned was that people don't care how much you know until they know how much you care," Sen. Ensign said. "Colorado State provided me with the finest education I could have attained. It was an incredible experience and one I will treasure my whole life. In addition to all the medical skills, I learned how to listen and how to make people feel important. Washington is all about relationships, and my work in veterinary medicine honed those skills."

So, whether it's petting the U.S. Senate's mascot Wags or offering up sage advice on biochemical warfare, the Veterinary Caucus brings heart, soul, intelligence, and integrity to the often beleaguered halls of the U.S. Senate. Not bad for a couple of animal doctors. ■

College Faculty Receive Prestigious National and University Honors



Dr. Barry Beaty

Two members of the faculty at the College of Veterinary Medicine and Biomedical Sciences – Dr. Barry Beaty and Dr. Bernard Rollin – have been selected to join the ranks of Colorado State’s University Distinguished Professors. Dr. Beaty also received another honor recently when he was elected as one of 72 new members to the prestigious National Academy of Sciences.

Selection as a University Distinguished Professor is the highest University honor a professor at Colorado State can receive. That designation, to be held by no more than 12 of the University’s 800-plus faculty members, recognizes excellence in teaching and research and is reserved for faculty with outstanding national and international reputations.

Election to the National Academy of Sciences is considered one of the greatest honors that can be accorded to a U.S. scientist or engineer. Founded in 1863 by a congressional act of incorporation signed by President Abraham Lincoln, the National Academy of Sciences is a private organization of 1,874 members. Congressional incorporation calls for the Academy to act as an official adviser to the federal government, upon request, in any matter of science or technology. Dr. Beaty, director of the Arthropod-borne and Infectious Diseases Laboratory (AIDL), was elected to the Academy in

Selection as a University Distinguished Professor is the highest University honor a professor at Colorado State can receive.

recognition of his distinguished and continuing achievement in original research. He becomes only the 40th microbiologist named to the Academy.

“I’ve often told Barry that he is my hero and that election to the Academy is an honor he has deserved for a long time,” said Dr. James Voss, dean of the College. “He is hard-working and smart, and has exceptional vision. I look at all the work he has done and am just incredulous at what he has been able to accomplish. His election as a member of the National Academy of Sciences and selection as a University Distinguished Professor pay tribute to him as an individual and to his achievements.”

Dr. Beaty came to Colorado State in 1982 from a faculty position at Yale and, by 1987, was director of the AIDL, turning the laboratory into an internationally recognized center of excellence in training and research in vector-borne diseases.

Dr. Beaty and the AIDL team conduct research aimed at improving the diagnosis, prevention, and control of diseases such as yellow fever, malaria, dengue hemorrhagic fever, West Nile virus, and other mosquito-borne encephalitis viruses. From 1989 to the present, Dr. Beaty’s research funding has totaled more than \$10 million. In 1989, he was named a Program Leader of the newly formed international MacArthur Foun-



Dr. Bernard Rollin

dation Network on the Biology of Parasite Vectors. This included an additional \$250,000 per year for research, student support, and building infrastructure over a 10-year period. Dr. Beaty continues to be supported by the MacArthur Foundation to host institutes and workshops to develop new approaches and strategies to combat vector-borne diseases throughout the world.

Dr. Beaty served as director of the Program of Research and Scholarly Excellence in Infectious Diseases from 1997 to 2000 and also served as associate dean for research in the College of Veterinary Medicine and Biomedical Sciences from 1995 to 97.

Dr. Bernard Rollin, who has a joint appointment in the departments of philosophy and microbiology, also was honored as a University Distinguished Professor. Dr. Rollin has been called “the father of veterinary medical ethics.” He’s also a Harley-riding weightlifter who rides and trains horses.

Educated in British philosophy at the University of Edinburgh and Columbia University, Dr. Rollin turned to a variety of concerns about animal treatment in the mid-1970s, working on questions from genetic engineering and issues about farm animals to animal pain and animal consciousness.

Addressing laboratory and teaching-

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Microbiology Addition Allows Mycobacteria Program to Expand

Built in 1968, the Microbiology Building was state-of-the-art with well-equipped laboratories, ample office space, and desirable classrooms. Fast forward 33 years, and the Microbiology Building is a dinosaur of old technology—cramped, overcrowded with people and equipment, and suffering from demands made on its heating, cooling, electrical, and plumbing systems. But help is on the way.

“We are a victim of our own success,” said Dr. Ralph Smith, head of the Department of Microbiology. “Our programs in mycobacteria research and arthropod-borne infectious diseases have been so successful and grown so rapidly, that we have simply run out of space.”

That shortage of laboratory space will soon be helped by the planned expansion of the Microbiology Building, set to begin construction in Fall 2001, with completion scheduled for Spring 2003. The expansion will extend off the back of the existing building and consist of three floors. The Macro-Molecular Resource Facility, currently operating in the Molecular and Radiological Biosci-

“Our programs have been so successful and grown so rapidly, that we have simply run out of space.”

ences Building, will occupy most of the first floor of the addition, covering 3,800 square feet. The remaining 13,000 square feet will hold new laboratories, common equipment areas, and new office space.

Moving into the second floor will be new laboratories for the research teams of Dr. John Belisle, Dr. Herbert Schweizer, and Dr. Claudia Gentry-Weeks. The third floor will house new laboratories for Dr. Michael McNeil, Dr. Delphi Chatterjee, and Dr. Ian Orme. The unique layouts of the new laboratories will create interest clusters and enhance the ability of researchers to work together.

The addition to the Microbiology Building is the latest in an ongoing attempt to expand the department’s research capabilities. The first was the

move of the Arthropod-borne and Infectious Diseases Laboratory out to the Foothills Research Campus. Last year, also at the Foothills Campus, the College completed construction and opened a bio-safety level-three laboratory building for use by AIDL and the mycobacteria group. Microbiology also is borrowing space in the Physiology Building, though, as Dr. Smith notes, “We did promise to give it back.”

“I attribute our growth and success to good, energetic, and bright faculty who are doing great work,” said Dr. Smith. “There is much concern worldwide about infectious diseases such as multi-drug resistant tuberculosis. Also, bioterrorism is scaring a lot of people, and there are concerns about foot-and-mouth disease, bovine spongiform encephalopathy, and chronic wasting disease here in Colorado. The National Institutes of Health is the only consistently growing federal agency that supports basic research, and infectious disease research at Colorado State is one of the cornerstones of the NIH biomedical research program.” ■

Faculty Receive Honors

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related animal issues raised in the College of Veterinary Medicine and Biomedical Sciences, Dr. Rollin spearheaded reform not only at Colorado State but all over the world, leading *Nature* magazine to call the University the best institution for animal treatment in the country. In 1982, Dr. Rollin published *Animal Rights and Human Morality*, an account of emerging social ethics and practical reforms. Legislation for laboratory animals became federal law in 1985, on the heels of work done by Dr. Rollin and two Colorado State veterinarians.

“Bernie Rollin was critical to the development of the laboratory animal

care program at Colorado State, as well as to instituting changes in the veterinary medical curriculum that would result in improved animal welfare while not compromising critical learning for our veterinary students,” said Dr. Voss. “He often took an unpopular stance and had to take his lumps, but our Professional Veterinary Medical Program and research programs are stronger thanks to his influence. In addition, his work has had a powerful impact on animal welfare issues nationally and internationally.”

Dr. Rollin is as familiar on campus for his Harley motorcycle shirts (and his Harley motorcycle) as he is for his 12

books, 300 refereed papers and chapters, and 800 invited addresses throughout the world. A native of New York City, he attended City University of New York, graduating magna cum laude and Phi Beta Kappa in literature and philosophy.

As for the honor being paid to him, Dr. Rollin said, “I can’t thank the people here at Colorado State enough. I started counting and got to 94, and I know I wouldn’t have time to name them all. I’ve had good, dedicated friends, and I’ve learned from people who said, ‘I can’t stand what you do, but at least let me help you do it right.’” ■

Radiology Group Marks 20th Anniversary of Linear Accelerator

Lounging around the radiation treatment area, the four dogs seem indifferent to the spectacular technology in the room next to them. A stretch and a yawn are about all the reaction you'll get from the dogs, but the staff has reason to celebrate. After all, it's been 20 years since the linear accelerator was introduced to the radiation treatment program at Colorado State University. A radical notion at the time, the linear accelerator is now an integral part of the Veterinary Teaching Hospital as well as an invaluable addition to the arsenal of weapons used to combat cancer.

It was the late 1970s when Dr. Ed Gillette, a professor in the Department of Radiological Health Sciences, and other faculty members began seriously to consider the advantages of a linear accelerator. At the time, the Veterinary Teaching Hospital was using a machine that required radioactive cobalt as a source of photons. The machine was limited in its treatment abilities, and Dr. Gillette thought the new treatment possibilities offered by a linear accelerator would offset the initial investment. In addition to just high-energy photons, linear accelerators also can treat directly with electrons.

"It was a radical idea at the time because animals were rarely treated for

cancer," said Dr. Susan LaRue, an associate professor in Radiological Health Sciences. "But Dr. Gillette had the foresight to see the direction veterinary medicine was taking and, in 1979 when the new hospital was built, space for a linear accelerator was included. The original accelerator was installed in 1981 and remained the only one in the country available for the treatment of animals until 1995. In 1995, we purchased a new accelerator, and the old one went to Yale University where it is used to treat human patients."

The linear accelerator offers distinct advantages over older X-ray machines. It can treat patients with deep-seated tumors using far-reaching photons or use electrons to treat patients with more superficial tumors. Three-dimensional modeling on computers allows for accuracy that targets tumors while minimally damaging surrounding tissue. Advances in anesthesia also contribute greatly to the success of the linear accelerator, as patients can receive daily and sometimes twice-daily treatments because of fast-acting anesthetics that also wear off quickly.

Animals receiving radiation therapy range from horses and dogs to cats and hedgehogs. Depending on its cancer, an animal receives 15 to 25 treatments over

Murphy, a Great Dane owned by Dr. Robin Downing, holds onto her sock puppet while awaiting treatment for osteosarcoma (bone cancer). Murphy is a cancer survivor, having undergone treatment for the same type of cancer three years ago. The linear accelerator is in the background.

Lab technician Frank Conway is much sought after as giver of toys, pats, and bugs.

The linear accelerator can treat patients with deep-seated tumors using far-reaching photons or use electrons to treat patients with more superficial tumors. Three-dimensional modeling on computers allows for an accuracy that targets tumors while minimally damaging surrounding tissue.

three to five weeks. Radiation therapy often is used in conjunction with surgery. Approximately 200 patients are treated each year with the linear accelerator. In addition, research also is conducted with the help of the linear accelerator. A current project funded by a College Research Council grant is looking at the treatment of lymphoma using half-body radiation, while a National Institutes of Health grant, in conjunction with Duke University Medical Center, is evaluating radiation, hyperthermia, and gene therapy. ■



C ontinuing Veterinary Medical Education

Please call the Department of Clinical Sciences at Colorado State University at 1-800-457-9715 or (970) 491-8373 for further information on all course offerings. Courses are sponsored by the Department of Clinical Sciences and the Colorado Veterinary Medical Association.

For Equine Sciences continuing education schedule, contact the Equine Sciences Program, Colorado State University, Fort Collins, CO 80523; (970) 491-8373; Web address: http://www.colostate.edu/depts/equine/continuing_ed/index.html.

September 2001

September 7-8 • International Course in Advanced Laparoscopy and Thoracoscopy

Instructors: Dr. Clarence Rawlings, Dr. David Twedt, Dr. Eric Monnet
Fee: \$800 (2 months prior to course); \$850 (1 month prior); \$900 (during September)

This exciting new course is for the clinician experienced in diagnostic laparoscopy, who would like to begin exploring the world of minimally invasive surgery. Several operative techniques, including full-thickness GI biopsy, pericardial resection, adrenalectomy, gastropexy, and partial lung lobectomy will be presented in a lecture format. Participants will then have the opportunity to perform several of these procedures during the five-hour lab the following day. Participants should have a basic knowledge of laparoscopy. Total CE hours: 13

September 13-14 • Equine Dentistry

Instructors: Dr. Joe Stricklin, Dr. Bradley Graham, Dr. Jack Easley, Dr. Leon Scrutchfield
Fee: \$450 CVMA member (lecture and lab); \$500 non-CVMA member

This program will consist of lecture and slide demonstration on anatomy and physiology of the mouth, including examination of the mastication process, procedures for floating teeth, removing wolf teeth, removing retained deciduous premolars, creating bit seats, treating malocclusion and abnormal wear, hook removal, dental extraction, incisor realignment, leveling teeth, cutting teeth, and the use of power tools. In the laboratory, groups of three to four veterinarians will work closely with the faculty in gaining hands-on training to perfect their skills in equine dentistry, using cadaver skulls and live horses. The latest dental equipment will be exhibited or demonstrated. In addition, participants are requested to bring their own dental equipment so that the best way to use it can be demonstrated.

September 20-21 • The Bond-Centered Practice Approach to Pet Loss Support: An Intermediate Level Certificate Program for Mental Health Professionals

Instructors: Carolyn Butler, Laurel Lagoni, Ashley Harvey, Greg Couger
Fee: \$350 (fee includes textbook)

This is an intermediate pet loss certificate program for human service professionals who want to make pet loss a practice focus. Using the "Bond-Cen-

tered Practice" approach, staff from the Colorado State University's Argus Institute and Changes Program teach helpers how to prepare pet owners for the emotional aspects of family-present euthanasia and how to help children and pet owners experiencing guilt, financial constraints, and unresolved grief. Strategies for obtaining payment for services and for becoming part of the "extended" veterinary care team are discussed. Special Requirements: Textbook: *The Human Animal Bond and Grief*

September 26-28 • Diagnosis and Treatment of Lameness in the Horse

Instructors: Dr. Ted Stashak, Dr. Wayne McIlwraith, Dr. Richard Park, Dr. Gary Baxter, Dr. Dean Hendrickson, Dr. Chris Kawcak, Dr. David Frisbie
Fee: \$450 CVMA member; \$500 non-CVMA member

The course is designed to cover the various causes of lameness in the horse. It will cover each condition and its diagnosis in detail (including diagnostic nerve blocks and radiographic features). The treatment (medical and surgical) of each condition will be presented, and the various surgical procedures will be performed by the participants in the lab.

September 29 • Feeding and Training the Performance Horse

Instructors: Dr. Jennifer MacLeay, Dr. Stephanie Valberg, Dr. Steve Duran
Fee: \$150

This one-day seminar will focus on feeding and training the performance horse. Featured speakers will include Dr. Jennifer MacLeay, Colorado State University; Dr. Stephanie Valberg, University of Minnesota; and Dr. Steve Duran, Kentucky Equine Research Inc. Discussion will focus on what and when to feed for optimal performance, training schedules, and feeding and training horses with underlying muscular disorders.

October 2001

October 10-12 • Current Topics in Feline Medicine

Instructors: Dr. David Twedt, various Colorado State University faculty
Fee: \$405 CVMA member; \$450 non-CVMA member

This course will provide discussion in selected areas currently relevant to feline medicine. The intent will be to provide clinically useful, practical information in the following subject areas: endocrine and metabolic diseases, dermatology, cardiology, urology, oncology, reproduction, neurology, and infectious diseases.

October 24-26 • Trimming and Shoeing for Natural Foot Balance – A Course for Veterinarians and Farriers

Instructors: Dr. Gayle Trotter, Gene Ovnicek, Dr. Barb Page
Fee: \$220

This course is designed for veterinarians and farriers to provide instruction in evaluating and preparing the foot for natural balance. Criteria for evaluation of the foot will be presented, including visual and radiographic assessments. A lab will be included that will allow hands-on foot preparation for either trimming or shoeing. Further information on the proper foot care for the treatment of laminitis also will be presented.

All courses have enrollment limitations. If the minimum enrollment is not reached three weeks prior to the scheduled date the course will be canceled.

October 25-26 • Flexible GI Endoscopy**Instructor:** Dr. David Twedt**Fee:** \$600 (2 months prior to course); \$650 (1 month prior); \$700 (during October)

A perfect introduction or refresher including indications, instrumentation, and technique. Five hours of lecture are followed the next day by four hours of wet lab, providing hands-on experience in upper GI endoscopic exam, PEG tube placement, and foreign body retrieval. The laboratory is limited in size to three people per station and each group will endoscope two dogs. Total CE hours: 9

October 27-28 • Introduction to Canine Arthroscopy**Instructors:** Dr. Timothy McCarthy, Dr. John Payne**Fee:** \$800 (2 months prior to course); \$850 (1 month prior); \$900 (during October)

This seminar presents a thorough and practical overview of canine arthroscopy of the shoulder, elbow, and stifle. Indications, instrumentation, and technique will be team-taught by two world-renowned small animal surgeons who perform canine arthroscopy on a routine basis in their practices. Six hours of lecture will be followed the next day by a five-hour practical lab. Laboratory is limited in size to two people per station. Total CE hours: 10

November 2001**November 2 • Pain Management Strategies for Small Animals****Instructors:** Dr. Khursheed Mama, Dr. Peter Hellyer, Dr. James Gaynor, Dr. Ann Wagner, Dr. Hartmut Renger, Ms. Denise Parker**Fee:** \$330

This course will focus on therapeutic options for pain management in small animals. Information will be presented in lecture, laboratory, and case discussion format. During the laboratory, participants will have the opportunity to observe and gain hands-on experience with selected drug administration techniques. Notes will be provided for participants.

November 3-4 • Pet Owner Care in a Bond-Centered Practice: Communicating Effectively with Emotional Clients**Instructors:** Carolyn Butler, Laurel Lagoni, Ashley Harvey, Greg Couger**Fee:** Veterinarians: \$400 CVMA member; \$450 non-CVMA member
Technicians: \$250 CVMA member; \$300 non-CVMA member

The goal of this course is to teach veterinarians and technicians about basic and advanced client communication techniques and to provide them with opportunities to practice these techniques. In addition, this course seeks to teach veterinary professionals how to apply effective communication techniques to their interactions with clients during difficult emotional situations. Specifically, the course offers practical suggestions for communication with clients who are angry, feeling guilty, talking about suicide, or facing decisions about their pet's euthanasia. Other topics covered include effective methods of crisis intervention, ways to deliver "bad" news, facilitating client-present euthanasias, and working with clients who are unable or unwilling to pay for veterinary services.

November 14-15 • Multi-Purpose Rigid Endoscopy**Instructors:** Dr. David Twedt, Dr. Rod Rosychuk**Fee:** \$600 (2 months prior to course); \$650 (1 month prior); \$700 (during November)

This seminar provides an overview of small animal otoscopy, rhinoscopy, and cystoscopy, using the 2.7-mm multipurpose rigid endoscope. This endoscope has been referred to as the "work horse" among small animal endoscopes due to the variety of procedures for which it can be used. Five hours of lecture will cover the indications, instrumentation, and technique for rigid endoscopy as it applies to ear, nasal, and urinary diseases. The following day will offer a four-hour, hands-on lab applying these techniques on anesthetized dogs. The video otoendoscope, suitable for use in awake patients, also will be demonstrated and used in the lab. Total CE hours: 9

November 16-17 • Small Animal Laparoscopy and Thoracoscopy**Instructors:** Dr. David Twedt, Dr. Eric Monnet**Fee:** \$650 (2 months prior to course); \$700 (1 month prior); \$750 (during November)

Lecture Only: \$200 (one day)

Technicians Only: \$200 (attend lecture and observe lab)

A nine-hour short course introducing the small animal practitioner to the indications and technique of laparoscopy and thoracoscopy. The course will include five hours of lecture and "Black Box" training, followed by a four-hour, hands-on laboratory where participants will perform laparoscopy and thoracoscopy on dogs. The laboratory is limited in size to three people per station. Total CE hours: 9

December 2001**December 12-14 • Management of the Acute Abdomen in the Horse****Instructors:** Dr. Ted Stashak, Dr. Josie Traub-Dargatz, Dr. Gary Baxter, Dr. Dean Hendrickson, Dr. Ann Wagner, Dr. Jennifer MacLeay, Dr. Charles Dickinson**Fee:** \$540 CVMA member; \$600 non-CVMA member

The clinical evaluation of the acute abdominal patient, leading to a decision whether medical treatment or surgical intervention is required, will be reviewed. Medical and surgical therapy will be discussed with specific emphasis on selection of drugs, preoperative patient preparation, anesthesia, intraoperative findings, postoperative care, and complications. Indications for the use of surgical stapling will be reviewed and the techniques illustrated. The laboratory will include application of techniques that are used in the clinical evaluation and treatment of an acute abdominal patient. This will be followed by a thorough review of surgical anatomy on a cadaver. The decision for surgical intervention, selecting anesthetic regimens, selection of laparotomy approach, and correction of the intraabdominal lesions are included. Each participant will have the opportunity to thoroughly explore the abdominal cavity and perform an enterotomy for emptying the large colon, an intestinal resection anastomosis, and other procedures they wish to perform. A demonstration of the use of surgical stapling equipment for resection and anastomosis of the large and small colon will be included.

Vet Survey Sent to Assess Antibiotic Use

Addressing one of the most important emerging health issues of the century, a team of veterinary epidemiologists at the College of Veterinary Medicine and Biomedical Sciences has devised a first-of-its-kind survey to assess the use of antibiotics by veterinary professionals.

The survey has been sent to 14,000 practicing veterinarians nationwide, and results will provide important information that could help guide national, regional, and local policy issues on antibiotic use. Although the focus has been on food animals, the survey is being sent to practitioners in other species groups as well. Food animal, equine, and companion animal veterinarians are being asked to participate in this campaign to gather specific information regarding how, when, and which drugs are being used in animals.

“There is no evidence that veterinarians in this country are using antibiotics injudiciously, but there has been no study or survey done on the attitudes and opinions of veterinarians in private practice on this issue,” said Dr. Paul Morley, the veterinary epidemiologist leading the project. “We felt we needed to take the pulse of the profession on this topic. This can help us determine the type and frequency of drugs being used and the types of problems for which they are being prescribed. We also should be able to consider where responsibilities should be divided – with the veterinarians, the drug companies, and government agencies.”

Antibiotic drug resistance has become a hot issue, according to the number of recent stories in the trade and general press. Federal agencies have proposed increasing limitations on the use of antibiotics in food animals out of concern for the impact on human health. The suggestion has been that, due to overuse, humans and other species have developed a resistance to many of the most popular antibiotics.

Although there is no question that antibiotic resistance occurs, Dr. Morley’s survey is the first to examine the role played by veterinary medicine, in addition to other sources.

“The data we retrieve from this survey will be of value to both animal and human health industries,” Dr. Morley said. “We believe it is possible for veterinarians to use antimicrobial drugs to promote health and production in animals and remain effective stewards of public health.”

Dr. Morley said results should be compiled and released by the end of the year. ■

College of Veterinary Medicine and Biomedical Sciences
Fort Collins, Colorado 80523-1601

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