insight

College of Veterinary Medicine and Biomedical Sciences Spring 2008 Vol. 34 No. 1

Private Funding Making Vision Reality

Kari's Fund at the Animal Cancer Center

Gates Foundation Support

Colorado State University

Dr. Lance Perryman

WELCOME

The College of Veterinary Medicine and Biomedical Sciences is undergoing a transformation. Everywhere you go on our three campuses, you see the unmistakable signs of progress. We are establishing new research, educational, and clinical programs while continuing to pursue excellence in our core strengths. We are building to accommodate our growth as well as to keep pace with technological advances. We are attracting the best and the brightest to our programs, creating a high-caliber research and teaching faculty who in turn are drawing in high-achieving students.

What many may not realize is the importance of private giving to all of these ventures. In this edition of *Insight* magazine, you'll learn more about the profound impact of private giving and how much of what we do today would not be possible without private support. From buildings to research programs, endowed chairs to scholarships, operating funds to emergency funds, private giving is essential to the College and its programs. As we continue to face funding challenges from the public sector, funding from private sources becomes increasingly critical.

In the fiscal year ending June 30, 2007, the College received $22 million in private donations. We saw the creation of two new endowed chairs, the Iron Rose Ranch University Chair in Equine Reproduction and the Abigail K. Kawananakoa University Chair in Equine Musculoskeletal Integrative Therapies. Endowed chairs, established with gifts of $3 million or more, provide a permanent source of funding that enables programs to recruit the finest scientific minds in the nation, allowing us to develop innovative programs with stable financial support.

A $1 million gift is earmarked for the new Professional Veterinary Medicine Building on the South Campus that will house second-year PVM students as well as provide additional classroom, laboratory, and office space. A $4 million pledge will help to support work at the Animal Cancer Center. Smaller individual gifts are bundled together to have a greater impact, allowing us to renovate surgical suites and research laboratories, hire young and gifted scientists, provide scholarship support to promising students, and help defray operating costs so efforts can be directed at conducting the best science, providing the finest clinical service, and teaching at the highest level.

Private foundations and associations also are an important source of financial support for the College. This year, the Bill & Melinda Gates Foundation awarded two grants totaling $3.7 million to support drug discovery work in tuberculosis. The American Heart Association is supporting one of our researchers with a Scientist Development Grant, a 4-year grant to help new faculty members establish their research programs. The Morris Animal Foundation is supporting canine influenza research that may one day help in the fight against an influenza pandemic.

Private giving is essential to the College of Veterinary Medicine and Biomedical Sciences. On behalf of the College, I'd like to thank each of you who have so generously supported the College in the past year, and in the years before. Let's continue to work together to make the College a place of energy and excitement, innovation and entrepreneurship, world-class research and teaching, and a model for what is possible through public-private partnerships.

Best Regards,

Lance Perryman, DVM, PhD
Dean, College of Veterinary Medicine and Biomedical Sciences

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insight

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On the cover: Dr. Gabriele Landolt conducts research on how influenza viruses are able to cross the species barrier, in this case between horses and dogs.

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and Dean Crick

Gates Foundation fights tuberculosis

Colorado State University's tuberculosis research program received two grants from the Bill & Melinda Gates Foundation in September to assist in the development of tuberculosis drugs. The grants, with a combined total of $3.7 million, are funding important areas of tuberculosis research that have previously been underfunded.

The two grants – one for $2.6 million and one for $1.1 million – will streamline and identify the best drug-testing methods and advance basic knowledge about how the bacterium that causes tuberculosis functions in a living host. The grants are part of a commitment from the Gates Foundation to accelerate the development of new drugs, vaccines, and diagnostics to combat tuberculosis.

"One impediment to scientific and biomedical advancement is the uncertainty associated with research funding from federal agencies," said Dr. Lance Perryman, Dean of the College of Veterinary Medicine and Biomedical Sciences. "When priorities change and the national focus shifts, or certain areas are neglected, investment in established and strong programs can wane, often causing those programs to lose ground that researchers have worked diligently to gain.

"We are finding more and more that private foundations and enterprises, such as the Gates Foundation, are stepping in to fill those gaps, allowing for continuity in research programs that may otherwise suffer because of funding shortfalls. The importance of this private investment for the public good cannot be overstated."

While government agencies typically fund basic tuberculosis research, funding dollars often run short in applied areas that need attention. The Bill & Melinda Gates Foundation asked for proposals from TB drug researchers after extensively examining problems that hinder tuberculosis drug development. The resulting plan asked researchers to propose ways to address gaps identified as slowing drug development.

A drug that treats tuberculosis in a novel way has not been developed in decades, and the bacterium that causes the disease continues to mutate and become resistant to current drug approaches. About 9 million people are infected with TB each year and 2 million die. Of the 9 million new cases each year, close to a half million are resistant to multiple drugs that once were used effectively to treat the disease. In 1993, the World Health Organization declared TB a global health emergency, a situation that continues today.

"The fight to develop drugs to treat and prevent tuberculosis has become increasingly important as the bacterium that causes the illness mutates."

The $2.6 million grant from the Gates Foundation will fund exploration of how the bacterium that causes tuberculosis grows and interacts in a laboratory compared to inside a living human or animal host.

Mycobacterium tuberculosis

"In a living host, the presence of bacteria changes the metabolism of the lung. In turn, the lung environment likely changes the metabolism of the bacteria," said Dr. Dean Crick, an Associate Professor and research project co-leader on the grant, which was given to the Mycobacterium Research Laboratories in the Department of Microbiology, Immunology and Pathology. "We don't know much about how the bacterial metabolism is altered in response to the host's defenses, making it difficult to replicate a realistic environment in a laboratory."

Researchers do know that the bacteria and the lung constantly interact and the environment consistently changes on a chemical basis. For example, bacteria feed on the lung, but researchers don't know exactly what they feed on or how that changes over time.

"Better understanding of how a disease state environment interacts with the bacterium that causes tuberculosis will help drug researchers improve their drug development and testing approaches," said Dr. John Belisle, a Professor in the Department of Microbiology, Immunology and Pathology and project co-leader.

Dr. Anne Lenaerts

The second grant for $1.1 million will help Colorado State researchers sort through different laboratory testing systems currently used to study the effectiveness of potential drugs, and gain an industry consensus among about the world's 20 TB drug research organizations on which laboratory tests are the most effective. In addition, the group will do an extensive review of historical TB research to look for useful research details and testing methods that may have been lost over time.

"The fight to develop drugs to treat and prevent tuberculosis has become increasingly important as the bacterium that causes the illness mutates," said Dr. Anne Lenaerts, the primary researcher on the drug model comparison grant. Dr. Lenaerts is an Assistant Professor in the Department of Microbiology, Immunology and Pathology. "An organized preclinical testing system among the tuberculosis community that is devoted to finding treatments will help to advance our research into results that can save lives."

For the past 10 years, the Mycobacterium Research Laboratories has managed the National Institutes of Health's drug compound testing program for tuberculosis. The laboratory has tested more than 85,000 potential drug compounds since 1997. The new compounds are being investigated as potential TB treatments by other universities and by pharmaceutical companies. The laboratory has developed numerous tests and models used to research TB drugs today, including specialized tests that facilitate screening large numbers of compounds within shorter time frames.


Kari

Kari's Fund gives operational stability

Office supplies and furniture, travel expenses, computers, and support staff – these are essential components of any successful enterprise, including a clinical, teaching, and research endeavor such as the Animal Cancer Center at Colorado State University. And, while such components are usually taken for granted, their cost can dampen the effectiveness of an organization if constant attention must be paid to making sure the lights stay on.

A new fund created at the Animal Cancer Center (ACC) is directed specifically at costs such as these and, when fully funded, will provide a perpetual source of operational income. Kari's Fund, established in the name of a former patient at the Animal Cancer Center, has a goal of a $10 million endowment to support activities at the ACC. To date, nearly $6 million has been raised by friends and clients of the Animal Cancer Center for Kari's Fund. This includes a pledge of up to $4 million in a dollar-for-dollar matching gift by Kari's owner, who wishes to remain anonymous.

"Because the Animal Cancer Center is not a distinct department and has no direct line funding, we've always been responsible for paying our operating expenses," said Dr. Stephen Withrow, Director of the Animal Cancer Center and a University Distinguished Professor. "Raising private funds for these expenses has been a challenge because it's not real glamorous. But this fund will be critical to our continued growth and success, allowing us to focus on what's really important – combating cancer through groundbreaking research and innovative patient care."

Kari's Fund will be used to support existing and new staff at the Animal Cancer Center, support small research projects and initiatives, fund general operations of the facility in support of cancer research, purchase core supplies and provide annual scientific equipment maintenance, and establish a visiting scientist and clinical program. The fund also will continue young faculty training programs, support graduate education and scholarships, conduct public service, provide consultation service for referring veterinarians and clients, fund travel to seminars and scientific meetings, and more.

Kari was a pioneer in the development of a new cancer chemotherapy protocol.

Kari, a female golden retriever, was a pioneer in the development of a new cancer chemotherapy protocol. In 2005, she was diagnosed with hemangiosarcoma, a type of cancer occurring in blood vessels, on her left kidney. At the time of her diagnosis the cancer had already spread to her lungs. Veterinarians thought she would only live days to weeks and there were no proven ways to treat her condition. The oncology team at the Animal Cancer Center proposed a new chemotherapy protocol and, to the delight of her owner and the oncology team, the treatment gave her several more months of a good quality life. Kari's treatment has since helped hundreds of dogs with the same cancer diagnosis.

Creating a new chair in musculoskeletal oncology

Dr. Ross Wilkins

Dr. Ross Wilkins has spent his professional career as a human orthopaedic oncologist focused on saving the limbs and lives of his patients, and not turning away anyone in need of his help. As co-founder and director of The Denver Clinic for Extremities at Risk (formerly known as the Institute for Limb Preservation), Dr. Wilkins also has forged a unique bond with the Animal Cancer Center at Colorado State University where he is a faculty affiliate – a bond of friendship, collaborative research, enhanced patient care, and turning visionary dreams into reality.

> "It's all about the passion . . . that kids and animals with cancer shouldn't lose their limbs or die. This chair assures that the passion endures."

To honor his work, his commitment to his patients, and his passion for pushing forward research into limb preservation, The Limb Preservation Foundation and the Animal Cancer Center are working together to establish the Ross M. Wilkins University Chair in Musculoskeletal Oncology at Colorado State University.

"It's all about the passion" said Dr. Wilkins. "The passion of many people who believe that kids and animals with cancer shouldn't lose their limbs or die. We need to find the answers. This chair assures that the passion endures."

Fundraising efforts at the Animal Cancer Center (ACC) and The Limb Preservation Foundation have reached the halfway mark, with organizers hoping additional donations will allow the chair to be fully funded by 2010. Once fully funded at $3 million, the chair will ensure the continuity of extremity research with a stable base of financial support.

"With the creation of this University Chair, we are honoring the legacy of Ross Wilkins and his work in musculoskeletal cancer," said Dr. Stephen Withrow, Director of the Animal Cancer Center and a member of the Limb Preservation Foundation's board of directors. "Ross has been a mentor, friend, and colleague for 20 years, and I have seen firsthand his dedication to his patients. He also is highly active in safety education, research, indigent care, and teaching and fundraising to support research in musculoskeletal cancer."

Drs. Withrow and Wilkins have worked together over the years to take limb-sparing procedures first developed at the Animal Cancer Center for veterinary patients, and adapt those

procedures to human patients. Such translational medicine is seen in other areas of cancer research at the ACC, particularly in the areas musculoskeletal cancer that the new endowed chair will support. The chair, notes Dr. Withrow, takes the long-term view of what the ACC and The Limb Preservation Foundation want to establish now to take both programs into the future.

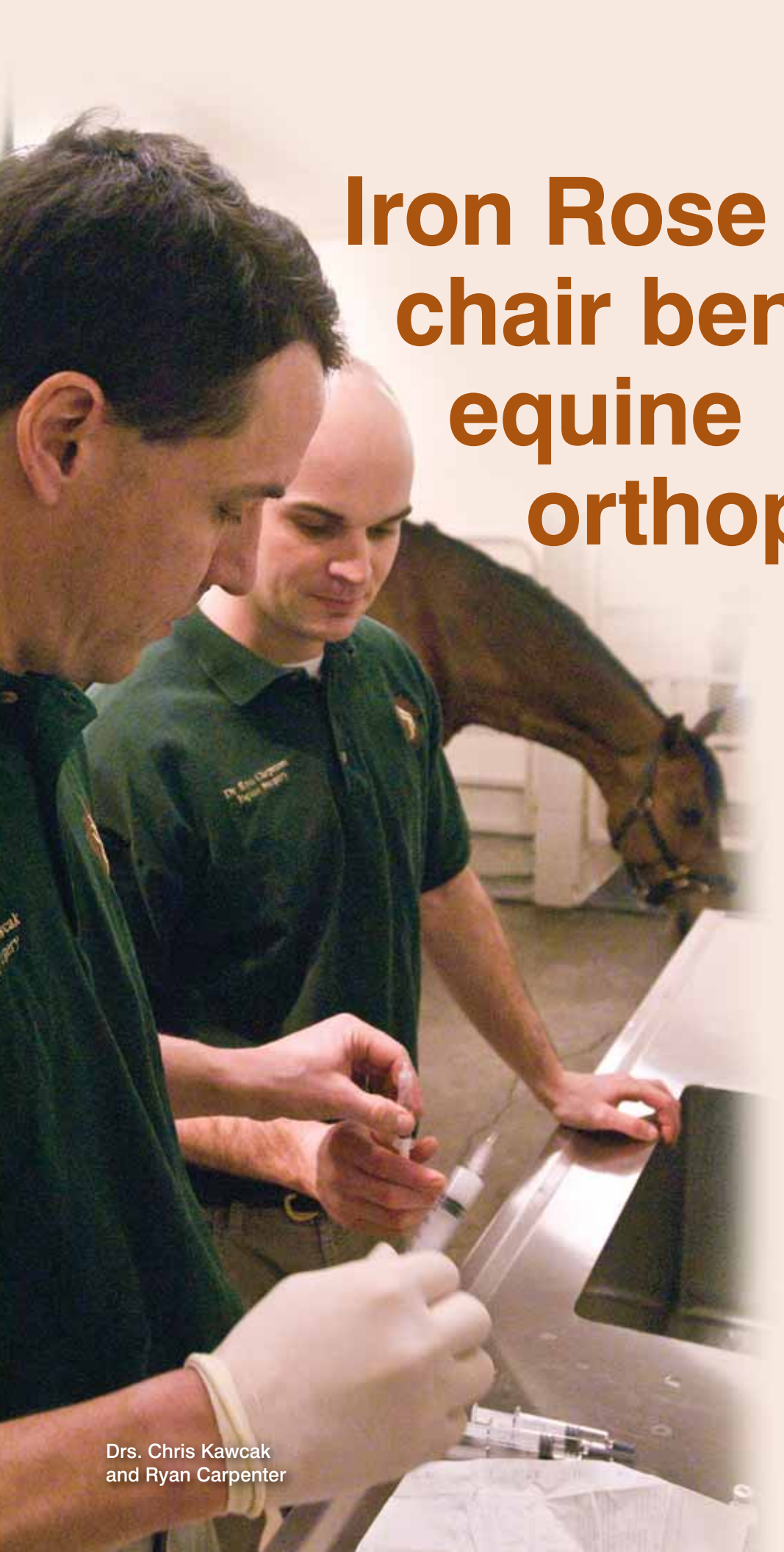
"People make programs and by supporting high-quality research scientists, we will broaden and deepen our research endeavors," said Dr. Withrow. "Our clinics already operate at a high level, the next step is to go deeper into research for cancer in animals and people."

The Denver Clinic for Extremities at Risk, sponsored by Presbyterian/St. Luke's Medical Center, was created in 1986 by Dr. Wilkins and the late Dr. Tom Arganese, who had the common vision that all people with complex extremity problems should have access to the best medical care, regardless of their ability to pay. Medical issues faced by patients at Extremities at Risk include cancer, diabetes, accidental injury, circulatory disease, and other medical conditions that compromise limb health.

The Limb Preservation Foundation was established in 2000 with the mission to support the prevention and treatment of limb threatening conditions due to trauma, tumor, or infection. This Colorado not-for-profit organization provides patient treatment programs, educational programs, and funding for extremity research with the goal of addressing the needs of individuals who are facing the potential loss of a limb.

Dr. Stephen Withrow

Iron Rose Ranch chair benefits equine orthopaedics



Drs. Chris Kawcak and Ryan Carpenter

In 2006 and 2007, the American public was captivated by the story of Barbaro. Winner of the Kentucky Derby, Barbaro suffered a catastrophic injury during the Preakness Stakes. The country was inspired by the thoroughbred's spirit and by the valiant efforts in Pennsylvania to help him recover from the life-threatening injury. After months of treatment, including six surgeries, Barbaro's owners made the difficult decision to euthanize him, concerned that his pain was unmanageable and he no longer could bear weight in any of his legs.

Equine clinicians at Colorado State University followed Barbaro's progress closely, knowing firsthand that the chances were slim he'd beat the odds and survive the fractures to three bones in his right hind leg. But they also knew that the work they were doing then and today may one day help predict, prevent, and treat injuries like that suffered by Barbaro and other equine athletes, and turn the odds in their favor.

Dr. Chris Kawcak is one researcher at CSU working on these advances. He holds the Iron Rose Ranch Chair in Equine Musculoskeletal Disease and Injury, created in 2004 to address

Dr. Kawcak with veterinary students.

the problems that cause equine musculoskeletal disease and injury, as well as improve prevention and treatment of these conditions. His work, along with that of other clinicians and researchers at Colorado State University's Orthopaedic Research Center, is benefiting from private investment into research and clinical work that is helping horses today and perhaps people tomorrow.

"The funding from Iron Rose Ranch establishes a position that goes way beyond my tenure to provide an endless resource, allowing us to continually fill this position and continually advance in this area of research," said Dr. Kawcak, an Associate Professor in the Department of Clinical Sciences. "The chair keeps in line with the University spirit of aggressively working for the things you think are important. With the funding from the chair, I can really focus on research areas in which there is a need, and it has opened whole new realms of study for me, particularly in the field of computer modeling."

Dr. Kawcak has several areas of interest in his research. The first is to improve early diagnosis of joint disease with improved imaging techniques and methodology using MRI, CT scan, and X-ray. He is working with researchers in biomedical engineering to develop and evaluate biomechanical models that show the joint, show how the animal uses a leg, and can provide a computer simulation of risk factors such as the shape of the joint and neuromuscular variation.

"This is our biggest push right now as it gives a more objective way to assess how we can reduce stress on joints as well as identify at-risk horses," said Dr. Kawcak. "We also are working on a wireless kinematic system to monitor gait. A small sensor is placed on the horse and we can monitor how they use their limbs when they run. We hope to be able to detect patterns that predispose a horse to joint disease or to fracture."

Dr. Kawcak and the team at the Orthopaedic Research Center also are using imaging to understand physiological characteristics that may lead to the type of fracture suffered by Barbaro. This work, along with a study of methods that may improve fracture healing, is sponsored by the Jockey Club, a private foundation. Other focuses of the research group at the center include gene therapy to improve cartilage healing, stem cell therapy for soft tissue healing, testing of new medications and therapies, track surface studies, and investigating integrative therapies to improve the field of equine rehabilitation. While work is conducted specifically in the best interest of the horse, similar problems in humans may one day benefit from research and clinical cases at CSU.

"Without the Iron Rose Ranch Chair and other private funding, much of this research simply would not be possible," said Dr. Kawcak, who also treats horses at the Iron Rose Ranch. "With this funding, I can pursue research interests that will benefit the horse, as well as continue my work as a clinician, something that is equally important to me."

Iron Rose Ranch, located near Carbondale, Colorado, specializes in breeding some of the finest cutting horses in the nation. In 2007, Iron Rose Ranch created a second chair at Colorado State University, the Iron Rose Ranch Chair in Equine Reproduction (see page 10).

Dr. Patrick McCue shows an ultrasound to Melissa Patten, a graduate student in Animal Sciences.

Iron Rose Ranch equine reproduction chair

The College of Veterinary Medicine and Biomedical Sciences announced in August the establishment of the Iron Rose Ranch University Chair in Equine Reproduction, funded with a $3 million gift. The chair will enhance the College's work in equine reproductive performance and is held by Dr. Patrick M. McCue, Associate Professor in the Department of Clinical Sciences and Director of the ERL. With the addition of the new Iron Rose Ranch Chair, endowed chairs at the College now number eight.

"The Equine Reproduction Laboratory has long been a world leader in advancing the science of reproduction and fertility," said Dr. Lance Perryman, Dean of the College of Veterinary Medicine and Biomedical Sciences. "The creation of the Iron Rose Ranch Chair in Equine Reproduction will enhance the research efforts at the laboratory, and provide a source of secure funding. The gift is a great honor for the College and a tribute to the outstanding faculty and staff at the Equine Reproduction Laboratory."

The Equine Reproduction Laboratory has a long history of developing innovative reproductive technology and protocols for the equine industry. Started in 1967, the laboratory is internationally renowned for its reproductive research including several discoveries that directly benefit human reproductive and fertility medicine, as well as breakthroughs that are helping to preserve the genetic materials of endangered species. During the past 30 years, the laboratory has developed techniques that now are routinely used in the equine industry such as collection of semen and artificial insemination, recovery and transfer of equine embryos, and shipping of cooled semen and embryos.

Dr. Perryman noted that the Iron Rose Ranch gift is especially appreciated as the College works to retain and attract world-class researchers and teachers. Because of limitations in state funding, private donations help the College compete for the best and the brightest to the benefit of CVMBS students, veterinary clients and research programs.

"Endowed chairs give us a permanent funding source to continue to retain and attract gifted individuals to our faculty," said Dr. Perryman. "We greatly appreciate the visionary thinking of those who chose to invest in our College in this way, as it represents a path toward continued growth and excellence."

The Colorado State University Foundation permanently invests funds that are given to establish endowed chairs, and the interest generated is used to support the chair. The principal is never used, so endowments allow continuous funding to supplement the chairholder's salary, graduate student work, research, professional travel, and other activities tied to the chairholder's program

Iron Rose Ranch, located near Carbondale, Colorado, specializes in breeding some of the finest cutting horses in the nation. This is the second chair established at Colorado State by the Iron Rose Ranch. The first, the Iron Rose Ranch Chair in Equine Musculoskeletal Disease and Injury (story on page 8), was created in 2004. Dr. Chris Kawcak, an Associate Professor in the Department of Clinical Sciences, was named to fill that chair.

Since the creation of the first chair, Dr. Kawcak and Dr. Paul Lunn, Head of the Department of Clinical Sciences, have continued to work with the Iron Rose Ranch on additional funding opportunities within the College. The new Iron Rose Ranch University Chair, noted Dr. Perryman, is a result of their joint efforts.

Chair promotes equine integrative therapies

When humans undergo orthopaedic surgery – whether to replace knees or hips, restore torn ligaments, or repair broken bones – follow-up rehabilitation and physical therapy are considered integral components of a successful treatment. Now, equine patients at Colorado State University can look forward to receiving the same rehabilitative benefits thanks to a $3 million gift that will help advance research in equine integrative therapies.

The College of Veterinary Medicine and Biomedical Sciences announced in November a gift to establish a third university chair in equine orthopaedics. A gift from Abigail K. Kawananakoa, of Hawaii, has created the Abigail K. Kawananakoa University Chair in Equine Musculoskeletal Integrative Therapies that will reside in the Orthopaedic Research Center. The chair follows the August announcement of a chair in equine reproduction, marking two such $3 million gifts to the College to support equine research and medicine in 2007.

"This gift supports important research at Colorado State that benefits both horses and humans," said Dr. Lance Perryman, Dean of the College of Veterinary Medicine and Biomedical Sciences. "The Orthopaedic Research Center is known internationally for its innovative research that addresses orthopaedic injuries and osteoarthritis including better methods of early diagnosis and new therapeutic targets. In addition, faculty and staff at the center apply that knowledge to equine athletes and share their discoveries with experts in human orthopaedic medicine."

The Orthopaedic Research Center at Colorado State is known worldwide for its research and clinical work to prevent joint problems in equine athletes, including racehorses and cutting horses, and for researching new ways to heal orthopaedic injuries including gene therapy and novel cartilage healing techniques, with some recently expanded work in human athletes.

"This chair completes our strategic plan in acquiring scientific support for rehabilitative manipulative therapies for musculoskeletal conditions, an area that is lacking in scientific-based evidence for the horse," said Dr. Wayne McIlwraith, Director of the Orthopaedic Research Center and the Barbara Cox Anthony Chair in Equine Orthopaedics. "I have had a long and rewarding relationship with Abigail and we are pleased and honored to house the chair in Miss Kawananakoa's name and look forward to the research discoveries and treatments to equine and human athletes the chair will support."

Kawananakoa has bred and raced multiple champion quarter horses. Her horses have won the two biggest quarter horse races in the United States; the All American Futurity with A Classic Dash and the Los Alamitos Million with Evening Snow. Both of these horses had arthroscopic surgery by Dr. McIlwraith.

Capital Campaign changes CVMBS

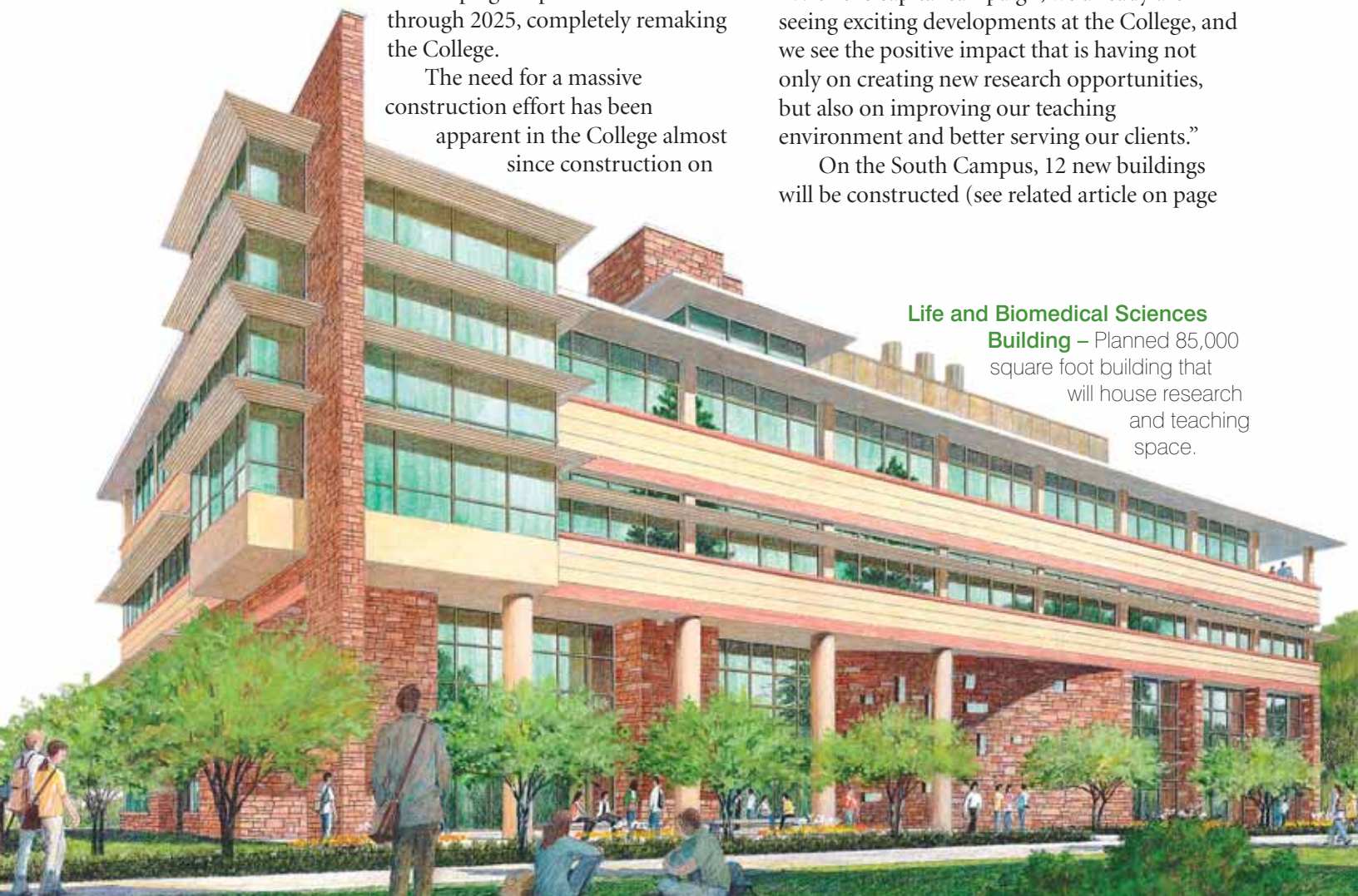
From Colorado State University's Main Campus to the South Campus to the Foothills Research Campus, the College of Veterinary Medicine and Biomedical Sciences is undergoing a transformation of grand proportions. Capital construction is the centerpiece of the College's 25-year capital campaign, and a number of buildings have already sprung from blueprints to bricks and mortar.

The campaign began with the new Animal Cancer Center on the South Campus and now it encompasses the Foothills and Main campuses. The campaign is planned to continue through 2025, completely remaking the College.

The need for a massive construction effort has been apparent in the College almost since construction on the James L. Voss Veterinary Teaching Hospital was completed in 1979. Existing and new programs put pressure on College facilities and the College's administration knew a long-term plan was necessary to meet current and future needs.

"Our faculty, staff, and students have been very industrious in their judicious use of existing facilities, but there reaches a point where you just can't make do with what you have and I think we have reached that point," said Dr. Lance Perryman, Dean of the College of Veterinary Medicine and Biomedical Sciences. "With the capital campaign, we already are seeing exciting developments at the College, and we see the positive impact that is having not only on creating new research opportunities, but also on improving our teaching environment and better serving our clients."

On the South Campus, 12 new buildings will be constructed (see related article on page



Life and Biomedical Sciences Building – Planned 85,000 square foot building that will house research and teaching space.

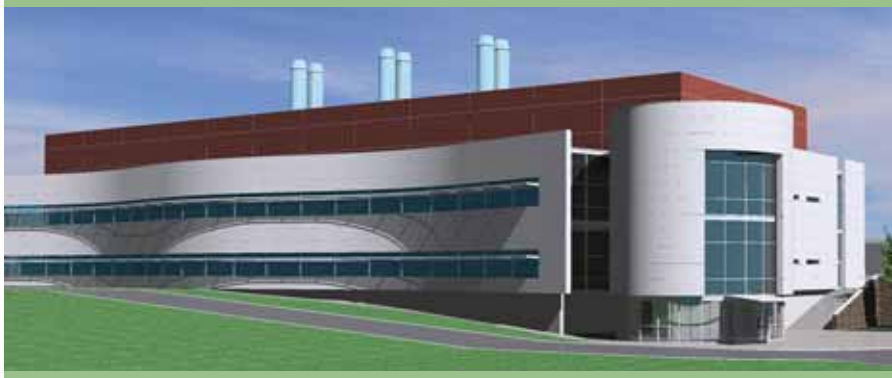
14), including a new Diagnostic Medicine Center, Agricultural Animal Hospital, and Equine Sports Medicine Building. On Main Campus, an addition to the Dean's Office is complete, an addition to the Microbiology Building for a Student Study Lounge was completed in 2007, and a new Life and Biomedical Sciences Building is planned.

On the Foothills Campus, a number of new buildings have been completed in the last several years including the Regional Biocontainment Laboratory, the Stallion and Client Mare Barns, and the ERL addition. Future plans include the Research Innovation Center and ongoing remodeling of the Infectious Disease Annex.

In addition to the College's capital construction projects, the campaign seeks to raise funds for endowed chairs and professorships to attract and support highly qualified faculty members. The College currently has eight University Chairs: the Iron Rose Ranch Chair in Equine Reproduction; the Iron Rose Ranch Chair in Musculoskeletal Equine Disease and Injury; the Barbara Cox Anthony Chair in Oncology; the Barbara Cox Anthony Chair in Orthopaedic Research; the Kenneth and Virginia Atkinson Chair in Musculoskeletal Imaging; the Stuart Chair in Oncology; the Abigail M. Kawananakoa Chair in Equine Musculoskeletal Integrative Therapies; and the John Alexander Chair in Large Animal Reproduction. The College also has four professorships.

New endowed scholarships are a priority of the College. Annually, more than $1.3 million is awarded in the form of scholarships, but the need is even greater. Funding also is being sought to purchase research and teaching equipment for new facilities.

"For the past 100 years, the College has provided the hope, care and cures in veterinary medicine and biomedical sciences," said Dr. Perryman. "As we embark on the next 100 years, the theme of one world, one health, one medicine is driving all of our efforts. Our capital campaign will bring the College forward into the next century, and help give our faculty, staff and students the most advanced research laboratories, technologically enhanced teaching facilities, and state-of-the-art clinical space from which to pursue our mission of excellence in teaching, research, and outreach."



Research Innovation Center (RIC) – Located at the Foothills Campus in the Judson Harper Research Complex next to the Regional Biocontainment Lab. The RIC will be a 60,000 square foot building, cost $52 million, and is scheduled for completion in spring 2010.

Diagnostic Medicine Center – A 90,000 square foot analytical and diagnostic lab. Paid for by the State of Colorado. Construction started in fall 2007.

Professional Veterinary Medicine Building – Planned 37,000 square foot addition will house teaching space connected to the James L. Voss Veterinary Teaching Hospital in order for second-year PVM students to relocate from the Main Campus to South Campus.

Private funding making vision a reality

When the 25-year development plan for the College of Veterinary Medicine and Biomedical Sciences' South Campus was unveiled five years ago, it seemed that an impossible task was at hand. Ambitious in its scope, the plan sought to take the 85 acres surrounding the James L. Voss Veterinary Teaching Hospital and turn it into a comprehensive Veterinary Medical Complex by the year 2025.

The plan was approved by the University's Board of Governors and the Colorado Commission on Higher Education. The land was available and ready for development. The next piece to put in place – funding. The College sought a combination of federal, state, University bond funds, and private funding to pay the estimated $160 million for Phase 1 of the South Campus construction.

"The existing Veterinary Teaching Hospital was completed in 1979, almost 30 years ago, and our programs have experienced explosive growth in the years since," said Dr. Lance Perryman, Dean of the College of Veterinary Medicine and Biomedical Sciences. "The purpose of our 25-year development plan was not to set unattainable goals, but to look into the future and using the tools we have make the best plans possible to prepare the College for the near- and long-term future."

Veterinary Medical Center Long Range Development Plan

An ambitious Phase 1 development plan includes the near-term construction of six buildings comprising more than 205,000 square feet. These buildings will be funded through a combination of State funds, University bond funds, donor funds, and college funds. An additional six buildings with 224,000 square feet also are planned: 1. Diagnostic Medicine Center; 2. Professional Veterinary Medicine Building; 3. Community Practice; 4. Agricultural Animal Hospital; 5. Equine Sports Medicine and Equine Isolation Critical Care Buildings; 6. Radiation Therapy Suite Remodel and Varian Trilogy Linear Accelerator; 7. Veterinary Medical Center Hospital Entrance

Thanks to the generous support of our donors, world-class research and treatment in areas such as equine orthopaedics (above) and animal cancer (left) are made possible.

The first project undertaken, even before the 25-year plan was fully implemented, was the Animal Cancer Center (ACC) completed in 2002. The ACC is an addition to the main hospital, funded through private donations including a $4 million gift from the Flint family, longtime clients of the center. This was quickly followed by the Orthopaedic Research Center and the Gail Holmes Equine Orthopaedic Research Laboratory, located to the north of the existing hospital. In 2007, the Colorado State Legislature approved funding for the Diagnostic Medicine Center, a 90,000 square foot analytical and diagnostic laboratory. Construction began in the fall of 2007 with completion expected in 2009 at a total construction cost of $42 million.

In Fall 2007, the Radiation Therapy Suite at the Veterinary Teaching Hospital was remodeled and a new Varian Trilogy Linear Accelerator installed. Funds for this project came from the Animal Cancer Center, Department of Environmental and Radiological Health Sciences, the Colorado State University Research Foundation, and user fees. Colorado State University's central administration will pay for a new entrance to the Veterinary Medical Center with new fencing and signage, as well as a realigned street entryway to better accommodate the hospital's expanded parking lot which was completed in Fall 2007.

Other buildings in the near-term construction plan include the Professional Veterinary Medicine Building, which will house the second year Professional Veterinary Medical students as well as teaching and office space. The Professional Veterinary Medicine Building has received initial funding with a gift from Gene Jensen. Jensen graduated from Colorado A&M (now Colorado State University) in 1950 with a degree in civil engineering and coursework from the School of Veterinary Medicine to enter into environmental engineering and public health. Jensen and his wife Betty Ruth Shults gave the gift to honor the memory of Jensen's first wife Esther Myrl Halstead.

The Community Practice building is a 32,000 square-foot planned addition to the Veterinary Teaching Hospital and will house the VTH Director and business office, community practice and exotic practice. Private funding is still being sought for this building. The Agricultural Animal Hospital is a planned 32,000 square-foot food animal medicine and surgery building to be built with funds currently committed by a generous donor.

"The support we have received to date for our development plan has been very encouraging and allowed us to complete a number of important projects, as well as begin construction or planning for others," said Dr. Perryman. "Without the support of our private donors, our 25-year development plan would mostly remain wishful thinking. With their support, we have been able to turn those plans to reality."

Dr. Chris Orton

Private gifts advance cardiac care

In the United States, heart disease is the leading cause of death in humans and the second leading disease-related cause of death in their canine companions. Lifestyle, age, and genetics are all factors in the prevalence of heart disease and, though death rates in humans have recently dropped because of advances in medical and surgical care, dogs continue to suffer at the same rates from debilitating heart failure or sudden death.

At Colorado State University's Animal Heart Center, cardiologists and cardiac surgeons are working to turn the tide against the ravages of heart disease and offering real hope to owners whose pets are afflicted with a heart condition. They also are conducting research that may one day improve cardiac outcomes for human patients. Thanks in large part to the support of private donors, the Animal Heart Center has been one of the few veterinary programs to offer open heart surgery along with an extensive medical cardiology program, as well as develop a research center to discover why heart disease develops and what can be done to prevent it.

"Much of the work we do at the Animal Heart Center simply wouldn't be possible without the support of private donors, most of whom have had dogs treated here," said Dr. Chris Orton, Head of the Animal Heart Center and a Professor in the Department of Clinical Sciences. "Private funding is essential as we work to bring the very best cardiology care to our patients as well as develop a comprehensive research program that will positively impact the health of both dogs and humans."

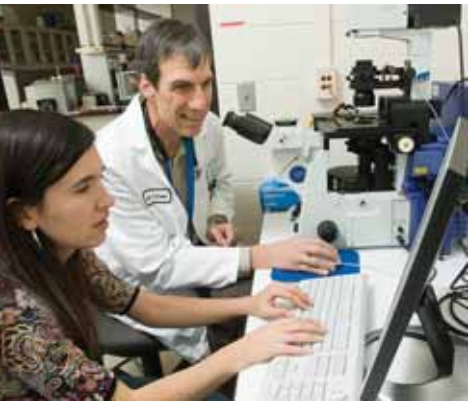
Dr. Orton points to a number of significant gifts that have had a major impact on the Animal Heart Center. Deborah Van-Dyke King, whose dog Custer was treated at the center, made gifts that have allowed the center to purchase a heart-lung machine, to remodel its research facility, remodel the cardiology rounds room and, this year, enable the construction of a new cardiac surgery room. Lois Arnold, whose dog Carmel was treated by Dr. Orton, organizes an annual dog walk in Phoenix, the Heart to Heart Pet-a-Rama, to raise funds for research into animal heart disease (see accompanying article on page 18). Funds raised to date have allowed the center to purchase necessary research equipment and, this year, enabled the hiring of a new research scientist, Dr. Carla Lacerda, to begin a proteomics program looking at the underlying causes of heart disease.

Another client of Dr. Orton's, Lori Venners, donated a gift allowing the center to purchase the laser capture microscope that will make Dr. Lacerda's research possible. Another donor provided $150,000 over three years to fund a cardiac surgery fellowship. In addition, notes Dr. Orton, many individuals have made gifts of $500 to $5,000 to support the research program.

"Two major branches of the Animal Heart Center are supported by private donors – clinical surgery and basic research," said Dr. Orton. "Our research program is focused on trying to discover the causes of valve disease in dogs, why they develop it and if there are ways we can prevent it. Degenerative mitral valve disease, which is mostly associated with aging, is an important problem in humans and causes 40

percent of heart disease in dogs. We are doing exciting research in this area with applications to dogs as well as humans."

Dr. Orton presented at an international meeting in New York last spring on the possibility of dogs as natural models of heart disease in humans, and he also will be presenting to the American Heart Association.



Clinical postdoctoral fellow Carla Lecerda and professor Chris Orton look at images from a laser capture microdisection microscope.

The National Institutes of Health already supports a research project at the Animal Heart Center that is looking at using tissue engineering to build a better heart valve with applications in humans and dogs.

"All replacement heart valves in use today are based on non-living tissues and have limitations," said Dr. Orton. "In humans, there are two options, a mechanical valve that requires the patient to be on blood thinners for the rest of their lives, or a bioprosthetic valve, using a pig valve fixed with glutaraldehyde. Humans can tolerate these valves, but dogs not so much. As a species, dogs are more likely to reject foreign tissue."

Dr. Orton's work focuses on tissue engineering that studies methods for removing antigens from living tissues and repopulating the tissue with the animal's own cells.

Along with continued NIH funding and additional research funds from private individuals as well as foundations and associations, such as the American Heart Association, the Animal Heart Center is hoping to establish an endowed chair this year. An endowed chair will create a stable funding source from which to continue to build the center's programs in research, teaching and clinical services, as well as allow the center to hire an additional cardiologist allowing for the expansion of the open heart surgery program.

"I'm very excited about what we will be able to do at the Animal Heart Center with the support of our donors and additional research support from private and public entities," said Dr. Orton. "Not only will we be better able to prevent, diagnose, and treat heart disease in animals, but what we learn will translate into improved care for people, too."

HEART to HEART
A WALK IN THE PARK TO SAVE A PET'S HEART

Heart to Heart Pet-a-Rama benefit

In the world of fundraising, it's usually the multi-million dollar gifts that garner the most attention. But a grassroots movement in Phoenix, Arizona, is proving that even a dog walk in the park can have a tremendous impact on a growing program.

The Heart to Heart Pet-a-Rama began in 2005, three years after Lois Arnold's dog Carmel was treated for a heart condition by Dr. Chris Orton and the cardiac surgery team at Colorado State University. Arnold wrote a book about her and Carmel's experience, "What Do You Mean, She's Just a Dog?" and she set about to create one of the nation's largest fundraising walks for research and treatment of animal heart disease.

Heart to Heart Pet-a-Rama is a two-mile fun walk held each spring in Phoenix's Steele Park. Walkers and their dogs raise money through entrance fees and by signing up sponsors. The benefit also helps homeless animals find families by hosting PACC 911, an animal adoption agency that brings people together with animals available for adoption during the Pet-a-Rama. This year's walk was held on February 17.

"The amount of money raised has grown significantly each year," said Dr. Orton, who is a Professor in the Department of Clinical Sciences and Director of the Animal Heart Center at the James L. Voss Veterinary Teaching Hospital. "Last year, the amount raised was $60,000. This level of support is making a huge difference in our research efforts. Lois has just been an amazing supporter of our program and we appreciate her dedication to Heart to Heart and to the Animal Heart Center."

Funds raised from Heart to Heart have made an immediate and lasting impact on the Animal Heart Center. The funds have been used to purchase needed equipment for the center's research facility and this year, using Heart to Heart funds, the center was able to hire a research scientist to spearhead investigations into proteomics, the protein partner to genomics.

"We hired a brilliant scientist, Dr. Carla Lacerda, who just finished her PhD in chemical engineering and is joining us as a postdoctoral fellow," said Dr. Orton. "Her work will focus on trying to discover the causes of valve disease in dogs, as well as ways to prevent valve disease. It would not have been possible for us to hire Dr. Lacerda without the support of Heart to Heart."

College home to two university superclusters

When Colorado State University first announced its Supercluster program in 2006, the College of Veterinary Medicine and Biomedical Sciences was honored to have one of its Programs of Research and Scholarly Excellence – the Program in Infectious Diseases – expanded and grandfathered in as Colorado State University's first designated Supercluster.

Less than a year later, a second College Program of Research and Scholarly Excellence – the Program in Cancer Research – became the second Supercluster at the University. The Infectious Disease Supercluster and the Cancer Research Supercluster were two programs built over more than three decades that benefited from outstanding faculty, an infusion of federal research grants, as well as private funding.

"Designation as a Supercluster is a great tribute to all the individuals who have worked so hard to create two internationally renowned programs in infectious diseases and cancer research here at Colorado State University," said Dr. Lance Perryman, Dean of the College of Veterinary Medicine and Biomedical Sciences.

The Supercluster designation provides programs with additional institutional support ($200,000-$400,000 annually), gives programs better leverage to obtain external funding, and incorporates greater international research components as consistent with the program's research focus. The University component of both programs is matched with a private "business arm" that will help speed discoveries from the lab bench to the marketplace.

Dr. Perryman noted that during the past several years, the College has seen a huge investment in the Infectious Disease Program by the University, the College, and numerous federal programs. This includes a $40 million grant to establish a Regional Center of Excellence for Biodefense and Emerging Infectious Diseases at CSU.

The Cancer Supercluster is a collaboration that has evolved from the early days of the cancer biology program in the 1960s to the current collaborative efforts that encompass 65 faculty members in 12 departments, across five colleges at CSU. The collaboration continues outside of the University with joint research efforts involving the University of Colorado Health Science Center as well as CU-Boulder, National Jewish Hospital, Children's Oncology Group, Denver Clinic for Extremities at Risk, Allosource, Varian Medical Systems, NASA, M.D. Anderson Medical Center, Harvard University, and many other private and public entities.

Dr. Scott Earley

Cardiovascular research program

For young faculty members applying for federal grants to support biomedical research, the process can be frustrating. You need to show a record of success in the laboratory to get funding, but you need funding to get that initial laboratory track record. While federal agencies like the National Institutes of Health do have some programs for young investigators, fiscal restraints often mean there isn't enough funding to support all deserving candidates.

Helping to fill the financial gap and encourage young investigators, organizations like the American Heart Association are offering more and more grants to help young scientists start new laboratories and develop their research work. Dr. Scott Earley, an Assistant Professor in the Department of Biomedical Sciences, is the recipient of one such award, a four-year Scientist Development Grant from the American Heart Association (AHA).

"The American Heart Association's Scientist Development Grant allows researchers to bridge the gap between postdoctoral work and faculty tenure," said Dr. Earley, who has had support from the AHA since 2005. "The grant I have pays for three months of salary and research support. NIH funding is difficult to get and requires a certain level of preliminary data and past successes, so my support from the American Heart Association is critical to my research program."

With the AHA grant, Dr. Earley is examining the role that endothelial cells play in the constriction of blood vessels. A single layer of endothelial cells lines blood vessels and, for many years, were simply thought to be part of the vessels' support structure. Twenty years ago, new research showed that the endothelial cells also make factors that regulate vascular muscle tone. (Dr. Robert Furchgott made this important discovery in 1986 and went on to receive the Nobel Prize for Physiology in 1998.)

"In our lab, we are working to understand the relationship between endothelial cells and muscular cells," said Dr. Earley. "We are looking at things like receptors, signaling pathways, and why different factors are produced. This field has only been around 20 years and there is an explosion of research, particularly because there may be opportunities to develop new pharmaceutical compounds that may have a profound impact on the treatment of vascular disease."

In the United States, 38 percent of the adult population has some form of cardiovascular disease. This year, 1.2 million Americans will have their first or recurrent coronary attack and 479,000 of them will die. High blood pressure affects 65 million Americans. Each year, approximately 700,000 Americans suffer from their first or a recurrent stroke and, of those, about 160,000 will die. Almost 35 million Americans have high cholesterol levels, a major risk factor for coronary heart disease and stroke.

Other work in Dr. Earley's laboratory includes studying transient receptor potential channels (TRP) to better understand their functional significance in vascular cells. He also is working with Dr. Ron Tjalkens, an Associate Professor in the Department of Environmental and Radiological Health Sciences, on the vascular aspects of Parkinson's disease; with Dr. Greg Amberg, an Assistant Professor in the Department of Biomedical Sciences, on vascular work (Dr. Amberg also has a Scientist Development Grant from AHA); and has collaborations outside of Colorado State University.

"We hope that our basic research will help improve the treatment of cardiovascular disease through a greater understanding of the basic physiology of how the heart and circulatory system function," said Dr. Earley. "Seventy-one million Americans are affected by some form of cardiovascular disease, so the stakes are high."

Influenza studies may give clues

Influenza virus

Avian influenza continues to raise concerns internationally for its potential to mutate, jump the species barrier, and cause an influenza pandemic in humans. While scientists are keeping a wary eye, a researcher at Colorado State University is investigating a similar species jump of influenza, but from horses to dogs rather than birds to people. Her work may give clues as to how influenza viruses are maintained in a new species, and help solve one of the many puzzles surrounding species specificity.

"In our laboratory, we are looking at the species specificity of the influenza virus," said Dr. Gabriele Landolt, an Assistant Professor in the Department of Clinical Sciences. "Influenza viruses are occasionally able to cross species barriers to infect other species, but these infections are usually self-limiting and often result in only one person or animal getting infected. They rarely transmit this novel virus to others. In the case of canine influenza, we have a situation where an equine virus infected dogs and is now maintained in that species."

"The implications of our work are not only important for dogs, but also to understand which viral factors are important to allow influenza viruses to jump the species boundary."

Dr. Landolt has a grant from the Morris Animal Foundation (MAF) to study what allowed the equine virus to jump from horses to dogs, looking at the molecular factors that determine species specificity. Her Morris grant started in 2006.

"Since that time, we have been able to determine that the viruses isolated from horses and dogs are now two distinct lineages," said Dr. Landolt. "Equine influenza successfully jumped the species barrier and we now have a new canine influenza sub-lineage that is maintained in the canine population of the United States."

Dr. Landolt said that the funding from MAF has helped her laboratory advance research, make connections with local shelters, and connect with other scientists conducting influenza work. The MAF grant has enabled her laboratory to develop a diagnostic test and offer it at no charge to area shelters to help diagnose and control respiratory disease outbreaks. In turn, she receives samples from the shelters to help in genetic characterization of canine influenza.

"The funds from Morris are allowing us to finish up this project and advance the field, and enabling us to apply to other funding agencies," said Dr. Landolt. "The implications of our work are not only important for dogs, but also to understand which viral factors are important to allow influenza viruses to jump the species boundary, whether in dogs or in people. We feel that the canine model is an excellent opportunity to understand what appears to be a one-time, well-defined cross species event that led to the appearance of canine influenza, and apply that to human risk factors for influenza."

Dr. Landolt, who is a large animal veterinarian at Colorado State University and virologist, looked at the receptors in the respiratory tract in dogs and found that they appear to be similar to those in the horse. She also is using reverse genetics to better understand the genetic characteristics of the


Dr. Gabriele Landolt

canine virus. The work may one day help lead to greater understanding of how influenza viruses mutate and how such mutated viruses may be prevented from causing a global outbreak in the human population of a virulent strain of influenza.

The Morris Animal Foundation (MAF), is the nation's largest non-profit funding organization of research benefiting companion animals and wildlife. This year, MAF is committed to spend $10 million to fund 120 health studies in 13 countries covering 35 species.

The flu is a contagious respiratory illness caused by influenza viruses. It can cause mild to severe illness, and at times can lead to death. According to the Centers for Disease Control, every year in the United States, on average, between 5 percent and 20 percent of the population contracts the flu. More than 200,000 people are hospitalized with complications from the flu and about 36,000 people die from the flu annually. The elderly, young children and people with certain health conditions are at a higher risk for serious flu complications.

Small donations for big causes

Sometimes, it's through the efforts of many that great deeds are done. Such is the case for those who contribute to the Miki Society and the Tribute Garden, two funds at the College of Veterinary Medicine and Biomedical Sciences that are having an impact every day on companion animals and the people who love them.

The Miki Society for Companion Animals Research supports research to help pets live longer and healthier lives. Gifts to the Tribute Garden go mainly to maintain and improve the Tribute Garden at the James L. Voss Veterinary Teaching Hospital where clients and their pets spend meaningful time together.

Gifts to the Miki Society are made by veterinarians, pet owners and their friends, and people who simply love animals. Many gifts are made in memory of a beloved pet. Veterinarians participating in the Miki Society use the program to reach out to clients in sympathy and remembrance. When a client's pet dies, their veterinarian makes a donation in the pet's name. The College then sends a letter to the veterinarian's client, notifying them of the donation. These funds provide seed money to smaller projects that help advance and improve veterinary medical care.

For the Tribute Garden, clients, friends, veterinarians, graduates, and others sponsor bricks for the garden path that can be inscribed with a personal message. The bricks are most often made in the memory of a beloved pet and placed in the Path of Honor. The Path of Honor provides a peaceful walkway of reflection surrounded by the flower gardens, grassy areas, and secluded alcoves of the Tribute Garden.

The Miki Society, established in 1989, has raised $784,130 for companion animal research. For the Tribute Garden, more than $105,000 has been raised through the sale of 552 tribute bricks.

2007-08 projects funded by Miki

- Dr. Eugene Ehrhart: 2-Deoxy-D-Glucose as a Therapy for Hypoxic Tumor Cells in Canine Osteosarcoma.
- Dr. Susan Lana: Comparative Analysis of Survivin Expression in Naïve and Relapsed Canine Lymphoma.
- Dr. Dawn Duval: Gene Expression Changes Associated with Metastasis in Canine Osteosarcoma.
- Dr. Craig Webb: A Novel Treatment for Type 2 Diabetes Mellitus: Oral Superoxide Dismutase Enzyme Supplementation in Diabetic Cats.
- Dr. Katherine Lunn: Radiosurgery Treatment for Cats with Pituitary Tumors: A Pilot Study.

Tribute Garden at VTH

The Fast and the Furriest

Each April, the Professional Veterinary Medical students at Colorado State University put on a race that draws all kinds of animals – from two-legged to four-legged to no-legged. While all done in good fun, the Fast and the Furriest Fun Run also has a serious side – to raise money for two good causes. And, for many students, it's a first opportunity to learn about philanthropic giving and creating a legacy.

The Fast and the Furriest is a 5K/1K run-walk fundraiser to benefit the Companion Care Fund and the PVM class' scholarship endowment. The event takes place at the James L. Voss Veterinary Teaching Hospital. This year's race is on Saturday, April 19.

The Companion Care Fund offers financial assistance to clients of the James L. Voss Veterinary Teaching Hospital who have an animal in need of emergency or immediate life-saving care. The fund is entirely need-based and is reserved solely for members of the community. Without the financial assistance provided by the fund, many clients would be faced with the difficult choice of declining care for their animal or relinquishing ownership. The Companion Care Fund provides hope for both owners and their animals in need.

Class scholarships are established by each graduating class of the Professional Veterinary Medical Program. Students work over time to fully endow their class scholarship so that funds can be awarded to a deserving veterinary student each year.

Students work many hours to coordinate the event which not only includes the race but, in the past, has featured a dog demonstration by Search and Rescue Dogs of Colorado, hot air balloon rides, music, food, race give-aways, awards for a variety of race categories (including furriest pet finisher), canine entertainment, raffles and more.

Intravenous procedure circa 1930

Centennial celebration

In 2007, the College of Veterinary Medicine and Biomedical Sciences celebrated its first 100 years of Hope, Care and Cures. During the year, the College commemorated a century of accomplishments by honoring the past while looking ahead to a brilliant future.

"There were so many wonderful events and activities including alumni receptions at the Colorado Veterinary Medical Association's annual meeting at Copper Mountain, the American College of Veterinary Pathologists meeting in Savannah, Georgia, and the American Association of Equine Practitioners conference in Orlando, Florida," said Dr. Lance Perryman, Dean of the College of Veterinary Medicine and Biomedical Sciences. "During the year, generous donors, including many faculty and staff, contributed $10,000 to fund the Centennial Scholarship, allowing us to give a $2,500 scholarship to one student in each of our undergraduate and professional veterinary medical degree programs."

In its centennial year, the College also saw the expansion of the DVM Class Scholarship

2007

Varian Trilogy Linear Accelerator

"It's difficult to imagine what the College will look like 100 years from now but, like those who came before us, I know we are helping to build that future today."

Program. The College now has 19 class-originated scholarships thanks to alumni of the Professional Veterinary Medical Program who gave so generously to help future generations of veterinary students fulfill their dreams.

During the year, College faculty and staff joined together to create historical displays of the College's colorful history, a booklet and video captured in photos and words a changing world, and a history "blog" on the College's Web site provided interesting details about the people and events that shaped the College's history.

"Our Centennial Celebration also gave us the opportunity to reconnect with alumni across the state and nation as our shared excitement brought us together to commemorate the College's colorful and illustrious history," said Dr. Perryman. "It was wonderful to share the memories of those who graduated from the College in the earlier years and who helped shape who we are today. It's difficult to imagine what the College will look like 100 years from now but, like those who came before us, I know we are helping to build that future today."

SCHOLARSHIPS

PVM graduates invest in future

The College of Veterinary Medicine and Biomedical Sciences would like to thank graduates of the Professional Veterinary Medical Program for their continuing support of the College's scholarship program. They are investing in the future of veterinary medicine by providing financial support to deserving students who will ensure continued excellence in the years and decades to come.

There are 19 class scholarships, as listed below:

- DVM Class of 1944
- DVM Class of 1945
- DVM Class of 1950
- DVM Class of 1957
- DVM Class of 1961
- DVM Class of 1962
- DVM Class of 1963
- DVM Class of 1964
- DVM Class of 1967
- DVM Class of 1968
- DVM Class of 1976
- DVM Class of 1980 Centennial
- DVM Class of 1998
- DVM Class of 2005
- DVM Class of 2007
- DVM Classes of 2003 and 2004
- Dr. Mark U. McKie Memorial Scholarship (DVM Class of 1953)
- Christine M. Omoto, DVM Memorial Scholarship (DVM Class of 1981)
- Dr. Earl Turner, Class of 1966, Memorial Scholarship

Vital statistics

The College

The Department of Veterinary Science was founded in 1907 and renamed the College of Veterinary Medicine and Biomedical Sciences (CVMBS) in 1967.

Undergraduate degrees have been offered through the College since 1967. The College comprises four academic departments and the Veterinary Teaching Hospital. The four departments are:

- Biomedical Sciences
- Clinical Sciences
- Environmental and Radiological Health Sciences
- Microbiology, Immunology and Pathology

The College participates in the Western Interstate Commission for Higher Education (WICHE) program and serves as the regional veterinary school for nine western states: Alaska, Arizona, Hawaii, Montana, Nevada, New Mexico, North Dakota, Utah, and Wyoming.

The Staff

Number of faculty	216
Research Associates	157
Administrative Professional Staff	69
State Classified Staff	263
Residents and Interns	46
Postdoctoral Fellows	59
Graduate Assistants	108

The Students

Undergraduates in Biomedical Sciences, Microbiology and Environmental Health	576
Graduate Degree Students	343
Biomedical Sciences Open Option Students	88
Professional Veterinary Medical (PVM) Students	523

The Graduates

From 1907 to 2007, 6,528 graduates received Doctor of Veterinary Medicine degrees and 2,509 received advanced degrees (MS and PhD).

The Cost

2007-2008 Tuition and Fees

Undergraduate:	Resident	$5,419
	Nonresident	$18,859
Graduate:	Resident	$6,266
	Nonresident	$17,804
PVM:	Resident	$14,627
	Nonresident	$40,927

Priority Research/Other Programs

- Cancer: Its Causes and Treatments
- Environmental, Toxicological and Radiological Health Sciences
- Infectious and Immunological Diseases
- Molecular, Cellular and Integrative Neurosciences Program
- Reproductive Biology and Genetic Engineering
- Veterinary Medical Program
- Student Scholarship Support
- Orthopaedic Research Program
- Human-Animal Bond Programs

Colorado State University

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