

CSU- Livestock Industry Listening Sessions

- Colorado Cattlemen's Association
- Colorado Livestock Association
- Colorado Farm Bureau
- Colorado Department of Agriculture
- Agriculture Industry Representatives
- CSU- Department of Clinical Sciences, Veterinary Diagnostic Laboratories, Department of Animal Sciences

**Colorado
State**
University



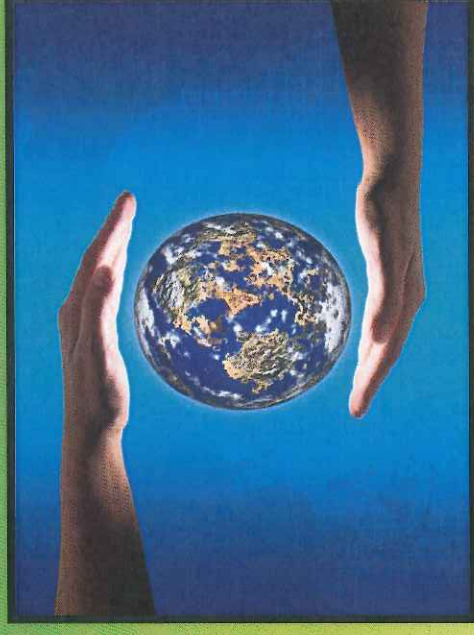
COLLEGE OF AGRICULTURAL SCIENCES
COLLEGE OF VETERINARY MEDICINE
& BIOMEDICAL SCIENCES

CSU- Livestock Industry Listening Sessions

- New combined DVM + Masters in Animal Science Program
- Enhancements in beef health program
 - Employ Herdtrax Cow/Calf Health and production management software.
 - Facilitate research efforts in beef cow/calf
- Creation of a field investigation unit (farm/ranch CSI?):
 - 24/7 response teams to acute or chronic livestock health issues
 - Expertise in Pathology, Microbiology, Toxicology, Parasitology, Management, Nutrition & Reproduction



One-Health Initiative:



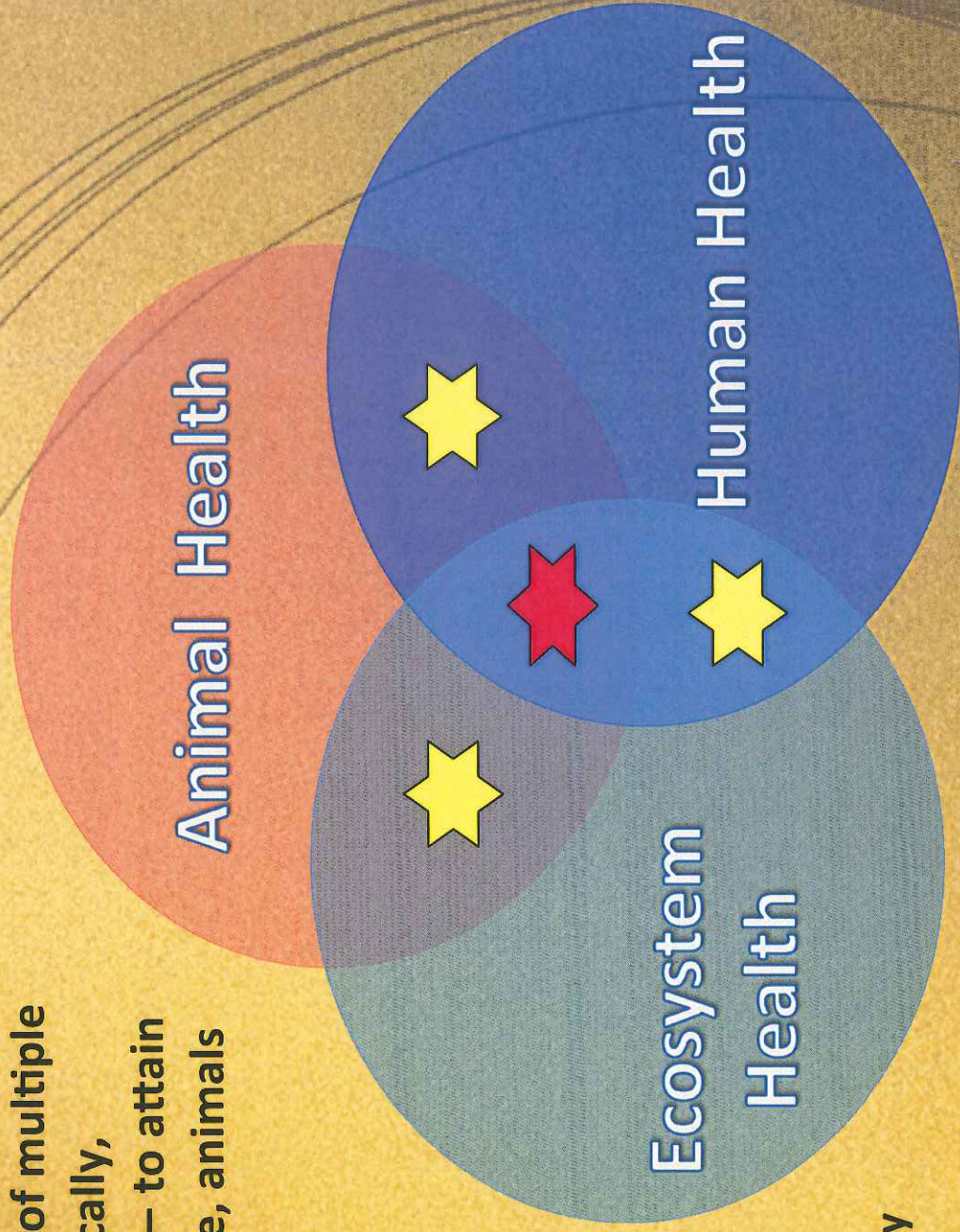
- International One-Health Symposium, Fall 2013
- Campus-wide initiative with government and industry inclusion
- Brainstorming retreats
- Dinner speaking series
- New research grants
- Hiring – Director of One-Health
- Long term goal – One Health Institute

One Health

"the collaborative effort of multiple disciplines — working locally, nationally, and globally — to attain optimal health for people, animals and the environment"

Examples:

- Human-wildlife conflict
- Food safety & security
- Environmental toxicology
- Sustainable agriculture
- Zoonotic diseases



Research

Cancer | Cardiology | Environmental Sciences | Infectious Disease | Neurosciences | Orthopaedics | Reproduction | Tuberculosis

Driving new knowledge, new technologies, economic vibrancy, and improved health for animals, people, and the planet

Our college is a biomedical research powerhouse,

with world-renowned programs working to solve some of the globe's most pressing problems.

We are uniquely positioned to provide significant discoveries in:

- **Translational medicine**, using basic and applied laboratory approaches and care for some 40,000 animal patients each year to better understand and treat human disease; and
- **One Health**, the worldwide scientific movement to investigate and solve problems at the juncture of human, animal, and environmental health.



What makes our college research enterprise unique?



- A leading contributor at a top-tier research university, with annual research expenditures of about \$55 million within total CSU research expenditures of more than \$313 million in FY 13
- No. 2 college in the nation for veterinary

research funding from the National Institutes of Health, a barometer of quality

- A veterinary teaching program consistently ranked in the top three in the nation
- Leadership in CSU Cancer Supercluster and Infectious Disease Supercluster, focused on technology transfer from eminent interdisciplinary research programs

- Home to four of the university's Programs of Research and Scholarly Excellence, CSU's most productive and innovative programs of discovery
- Eight University Distinguished Teaching Scholars and Professors, a crucial way to fulfill our land-grant missions in teaching, research and service

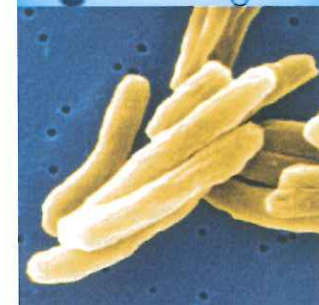
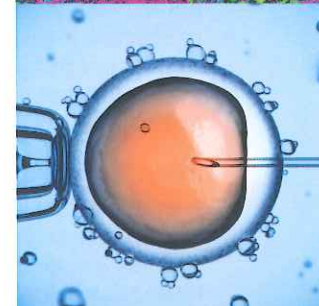
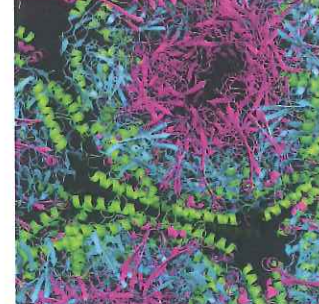
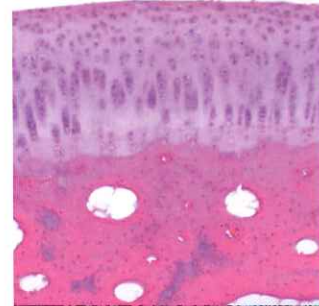
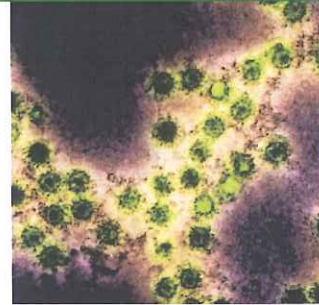
- Focus on international partnerships and research impact
- Close collaboration with colleagues across campus, especially in the One Health arena
- Vital partnerships off campus, including leading Colorado medical centers; with partnerships and proximity to key local, state, and federal agencies

- Research facilities include the Infectious Disease Research Center, a complex devoted to multidisciplinary translational infectious disease research. Includes sealed Biosafety Level-3 space for research with select agents.

- Graduate students, including those pursuing the Doctor of Veterinary Medicine, make up more than half of our total student enrollment, providing key support for laboratory operations

- A remarkable 70 percent of our graduate students in biomedical sciences go on to medical school, meaning our research programs help generate human capital central to improving global health

- Aggressive pursuit of extramural, corporate and foundation funds for research programs



Colorado State University

COLLEGE OF VETERINARY MEDICINE
AND BIOMEDICAL SCIENCES

We leverage federal funding for excellence in discovery – helping to close the nation’s innovation deficit

High-impact research programs with unique funding needs

Animal Reproduction & Biotechnology Laboratory*

Focus: reproductive biology of domestic animals, with findings applicable to human reproduction. Investigating assisted reproductive technologies; reproductive cancers and toxicology; infectious disease; fertility, sterility and contraception; pregnancy, development, and stem-cell biology. Home to Equine Reproduction Laboratory.

Arthropod-borne & Infectious Diseases Laboratory

Focus: applying genetics and genomics to understand transmission, persistence, and emergence of vector-borne pathogens to discover novel vector and disease-control strategies. Working to control diseases ranging from West Nile Virus in Colorado to malaria in West Africa.

Cardiovascular Institute

Focus: understanding fundamental causes of heart disease and developing novel treatments and technologies for a leading cause of disability and death in animals and people. The newest college research institute, marked by translational medicine involving numerous physician partners in Colorado and beyond.

Center for Environmental Medicine

Focus: environmental toxicology that could threaten human health, joining global partners and research collaborators in environmental sciences, biological sciences and chemistry. Some recent high-profile work focuses on thwarting potential agents of bioterrorism with new antibiotics, of particular interest to U.S. military.

Feed the Future Innovation Lab

Focus: providing innovative ways to adapt small-scale livestock systems in Sub-Saharan Africa and South Asia to climate change. Excellent example of applied One Health science. Supported by U.S. Agency for International Development and designated as a Collaborative Research Support Program.

Flint Animal Cancer Center^

Focus: treating dogs with naturally occurring cancers to help animals and to better understand and cure cancer in people. Home to the world’s largest group of scientists studying cancer in pets, with innovations including limb-sparing surgery. Its translational medicine is especially important, given that one in three people will develop cancer in his or her lifetime. A key component of the CSU Cancer Supercluster.

High Plains Intermountain Center for Agricultural Health & Safety

Focus: improving the health, safety and well-being of people working in U.S. agriculture, forestry and fishing industries. Multi-disciplinary team researches mechanical hazards, tractor roll-overs, musculoskeletal stress, respiratory disease and traumatic injury. Led by a CSU primary investigator and one of 10 national agricultural centers funded by the National Institute for Occupational Safety and Health.

Molecular, Cellular & Integrative Neurosciences*

Focus: function of the nervous system, emphasizing neuronal differentiation, degeneration and regeneration, ion channels and membrane physiology, synaptic mechanisms, neuronal circuitry and chronobiology, sensory biology, artificial neural networks, cognitive neuroscience and neurovirology. Classified as a Special Academic Unit, with growing interdisciplinary work and a newly established undergraduate degree in neuroscience.

Mycobacteria Research Laboratories^

Focus: fully understanding *Mycobacterium tuberculosis* to eradicate tuberculosis, an infectious respiratory disease that annually kills an estimated 1.5 million people around the world. CSU is home to 170 experts in TB and related diseases, the world’s largest group of university researchers investigating tuberculosis. Significant collaboration on six continents – and a key part of the CSU Infectious Disease Supercluster.

Prion Research Center*

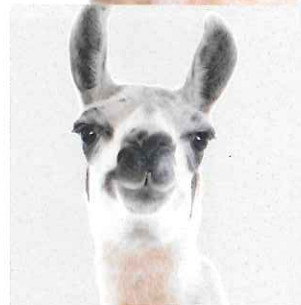
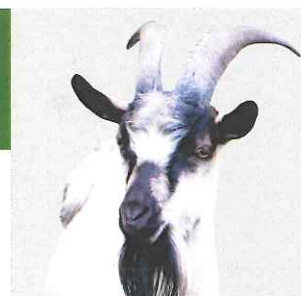
Focus: prions and other misfolded proteins that cause neurodegenerative diseases, or transmissible spongiform encephalopathies. CSU scientists were the first to identify chronic wasting disease in northern Colorado deer. Their knowledge is central to understanding prion diseases in other animals worldwide. These insights now are applied to human protein misfolding disorders, including Alzheimer’s, Parkinson’s, Lou Gehrig’s and Huntington’s diseases.

Rocky Mountain Regional Center of Excellence

Focus: countering threats from bioterror agents and emerging infectious diseases. A key funding source for large-scale interdisciplinary research, led by a CSU primary investigator and supported by National Institutes of Health. One of several such centers nationwide. Close connection to CSU provides important research opportunities and discoveries, and a functional manufacturing core allows unique capacities for marketing potential novel vaccine and therapeutic agents.

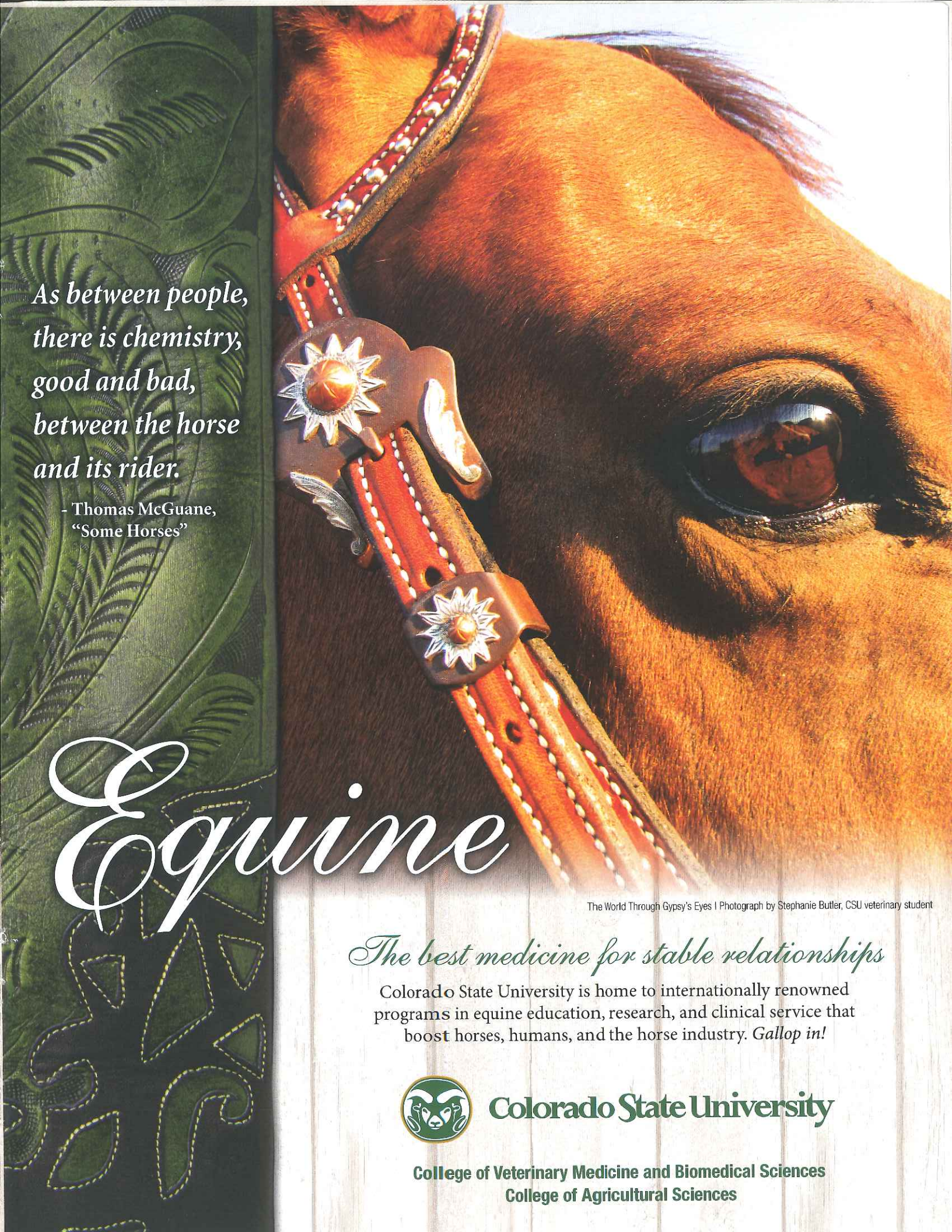
* Colorado State University Program of Research and Scholarly Excellence

^ Key component of a Colorado State University Supercluster™



Colorado State University

COLLEGE OF VETERINARY MEDICINE
AND BIOMEDICAL SCIENCES



*As between people,
there is chemistry,
good and bad,
between the horse
and its rider.*

- Thomas McGuane,
"Some Horses"

Equine

The World Through Gypsy's Eyes | Photograph by Stephanie Butler, CSU veterinary student

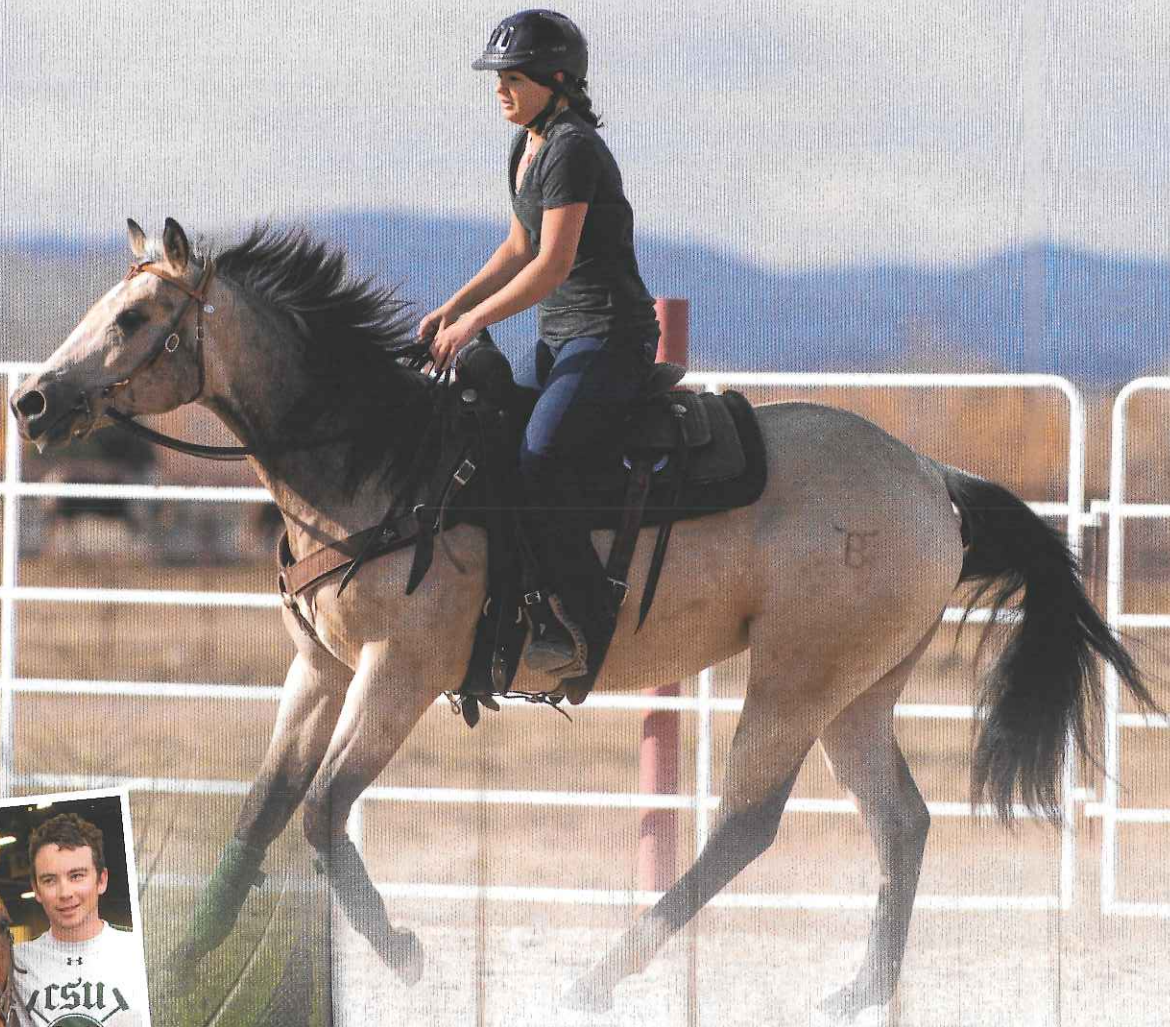
The best medicine for stable relationships

Colorado State University is home to internationally renowned programs in equine education, research, and clinical service that boost horses, humans, and the horse industry. *Gallop in!*



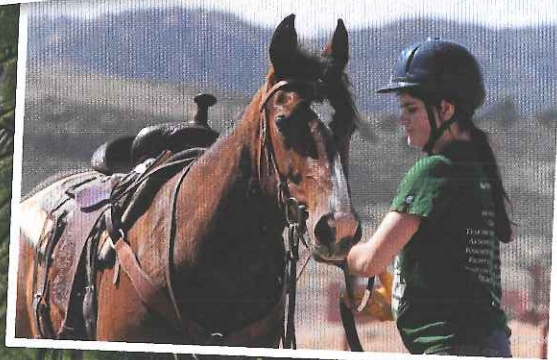
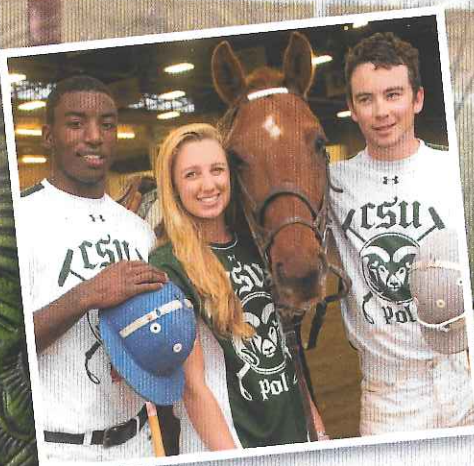
Colorado State University

College of Veterinary Medicine and Biomedical Sciences
College of Agricultural Sciences



Equine Sciences Undergraduate Program

Our trademark Equine Sciences Program, begun in 1986, was the first in the United States to offer a bachelor's degree in equine science. With about 400 undergraduates enrolled from across the country and abroad, the program offers one of the most popular majors on campus. What makes it unique? The program provides a combination of rigorous science and hands-on education – with support from key industry partners to help ensure that student learning is relevant. The program prepares students for careers in the robust horse industry, which tallies a \$102 billion annual economic impact in the United States, according to the American Horse Council.



Information

equinescience.agsci.colostate.edu
(970) 491-8373

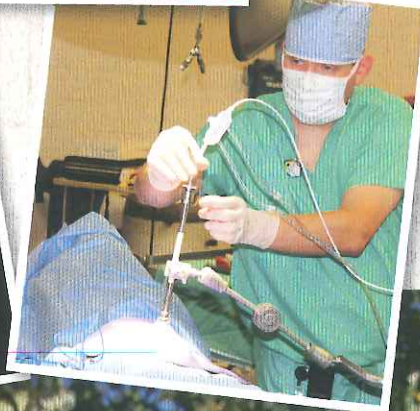
Dr. Jerry Black, Director

Dr. Jason Bruemmer, Associate Director

Equine Medicine and Surgery

James L. Voss Veterinary Teaching Hospital

*W*here else will your horse receive the very best medical treatment – while your case trains the next generation of equine veterinarians and contributes to scientific knowledge that supports the horse? Our Veterinary Teaching Hospital has a long tradition in equine medicine and surgery; clients say their horses receive both excellent medical care and remarkably compassionate attention from our veterinarians, nursing staff, and vet students. We offer a full array of services: general care, emergency care, internal medicine, surgery, and sports medicine. We provide specialty care for your horse's teeth, skin, heart, and eyes. Our Equine Field Service will travel to you, providing on-site treatment. You also may consider enrolling in one of our clinical trials, which address some acute and chronic healthcare needs with medication, novel techniques, and technologies now under development. The equine team at our Veterinary Teaching Hospital partners closely with referring veterinarians, and with our equine orthopaedic and reproduction programs.



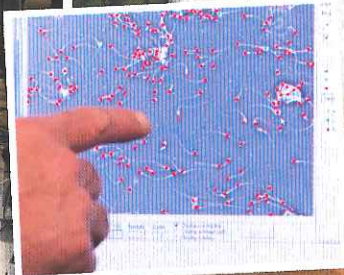
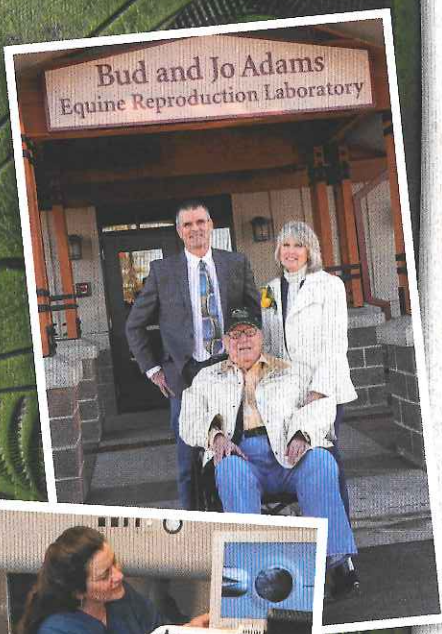
Information

csuvth.colostate.edu
(970) 297-5000

Dr. Chris Kawcak, Director

Equine Reproduction Laboratory

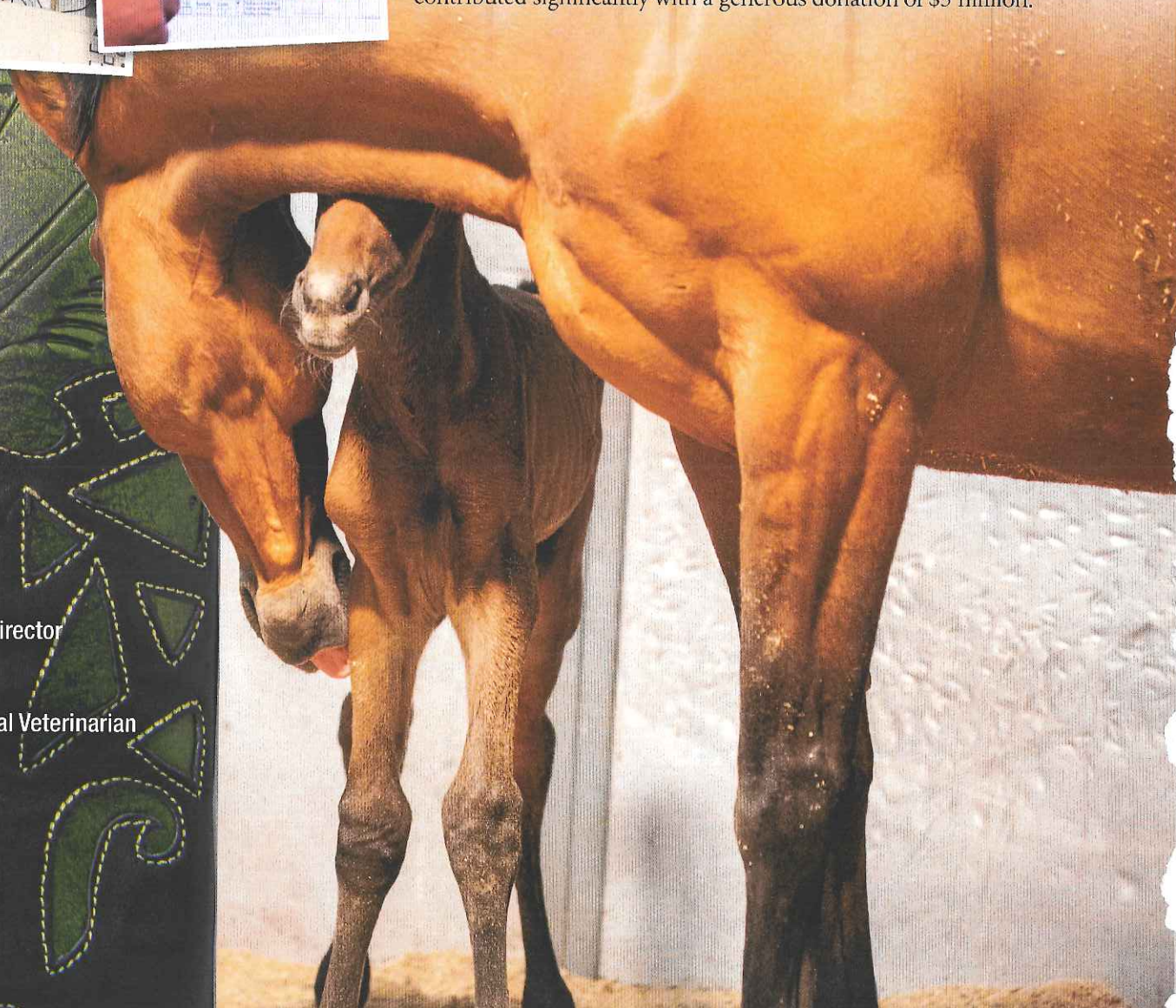
Our famed fertility clinic develops and delivers cutting-edge equine reproductive techniques and technologies for horse owners and the horse industry. For some 45 years, the program has preserved valuable equine genetics through its discoveries, its training programs, and its clinical services. Many services that are routine today – such as semen collection, artificial insemination, recovery and transfer of equine embryos, and the shipping of cooled semen and embryos – were pioneered by the CSU program once known simply as the “stallion lab.” The program has grown to additionally focus on mares, foals, and advanced reproductive services, including oocyte transfer and intracytoplasmic sperm injection. Many of our discoveries inform human reproductive medicine. Fire destroyed our main laboratory building in 2011. We celebrated the lab’s grand re-opening in spring 2013; longtime supporters Bud and Jo Adams contributed significantly with a generous donation of \$3 million.



Information

erl.colostate.edu
(970) 491-8626

Dr. Jerry Black, Director
Dr. Pat McCue,
Senior ERL Clinical Veterinarian



Orthopaedic Research Center

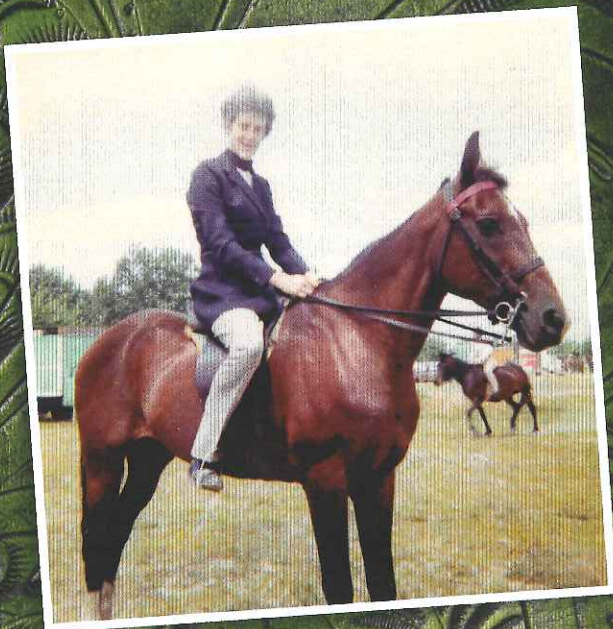
Our Orthopaedic Research Center is a giant in understanding and treating musculoskeletal disease and injury in the horse. The center's founding director, Dr. Wayne McIlwraith, pioneered, developed, and refined equine arthroscopic surgery. The work didn't stop there. He and colleagues are advancing discoveries in regenerative medicine with research in the use of stem-cell therapy, gene therapy, and autologous biologic therapies. Ultimately, the center's teaching, research, and clinical service are aimed at providing solutions to joint injuries and arthritis, especially in performance horses. Many of the center's insights translate to human orthopaedics, demonstrated in support from the National Football League and the renowned Steadman Clinic in Vail, Colo. The Orthopaedic Research Center received a significant endorsement in fall 2013, when the Malone Family Foundation of Denver donated \$6 million to expand the center's Equine Sports Medicine and Rehabilitation Program.



Information

equineortho.colostate.edu
(970) 297-4165

Dr. Wayne McIlwraith, Director



“There’s lots of literature to support the use of therapeutic horseback riding for people with autism. I’ve had parents tell me that their kids’ first words came when they were riding.”

*– Dr. Temple Grandin, professor,
CSU Department of Animal Sciences*

“Equine therapy is such an amazing benefit in assisting our veterans and service members in getting back to being themselves once they return home.”

– Wounded Warrior Equestrian Program

Information

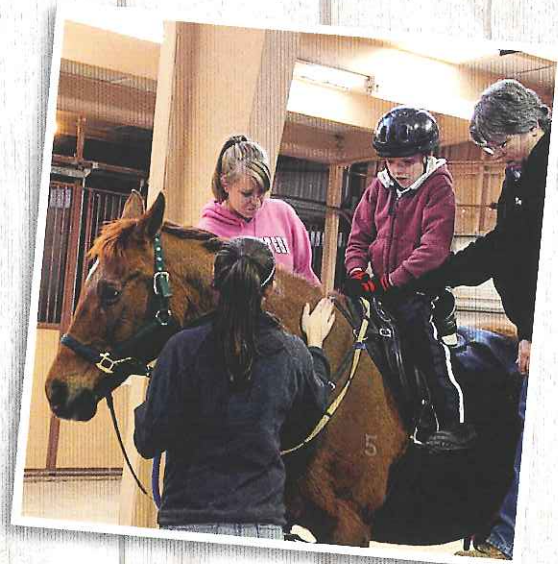
Dr. Jerry Black, Director of the CSU Equine Reproduction Laboratory and Equine Sciences Undergraduate Program, (970) 491-8669 or jerry.black@colostate.edu

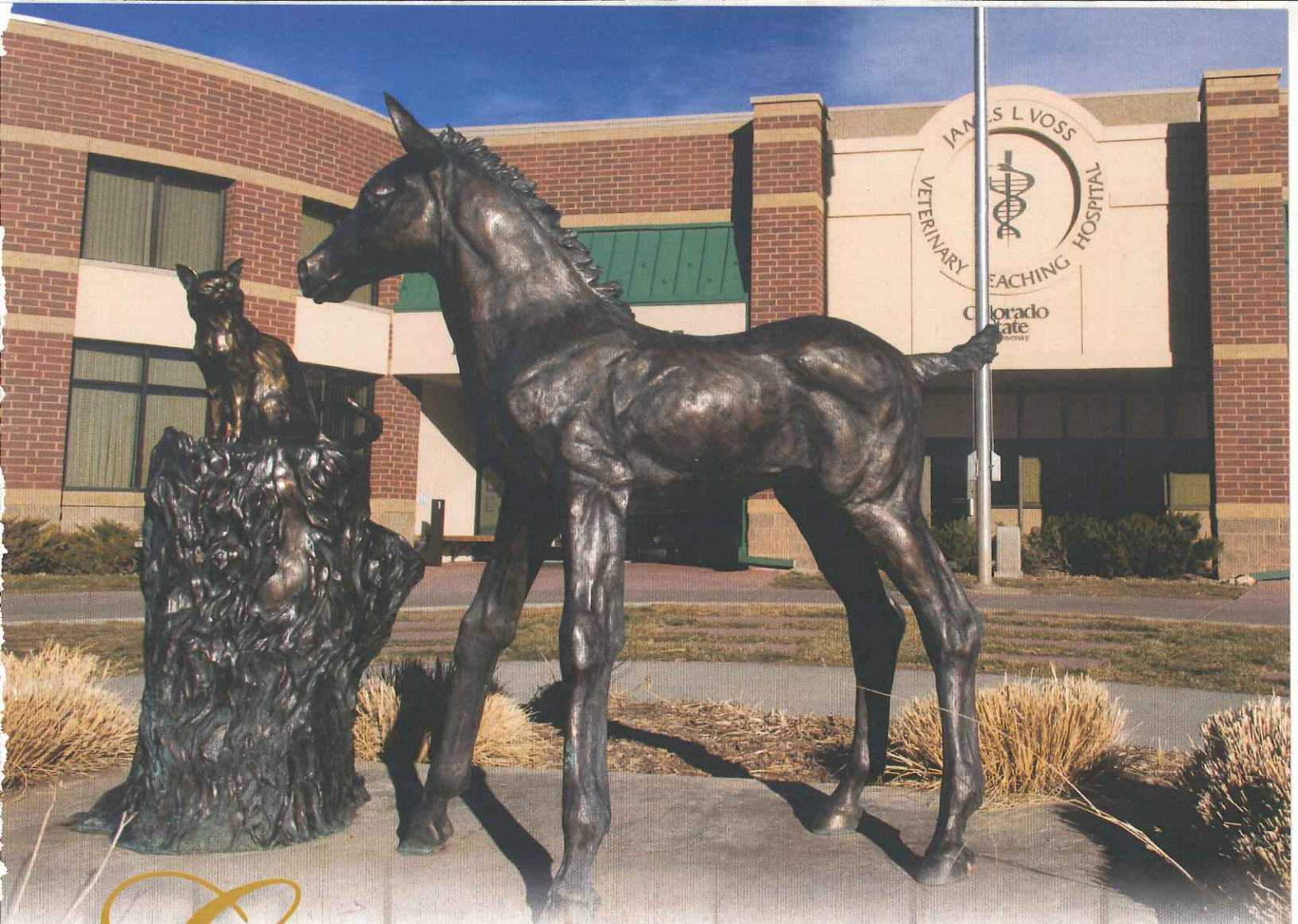
Dr. Kevin Pond, Head, CSU Department of Animal Sciences, (970) 491-7295 or kevin.pond@colostate.edu

What’s next?

A major center for equine-assisted therapy

Dr. Temple Grandin is a Colorado State University professor of livestock behavior and the world’s best-known person with autism. She is acclaimed for vastly improving food-animal welfare and for her role as a champion for people with autism and their families. Horses were Dr. Grandin’s first love. Years before she used insights gained from autism to pioneer humane animal-handling systems, she found solace and confidence in riding and working with horses. It’s natural that Colorado State University would build upon its blossoming expertise in equine-assisted activities and therapies by creating a center in honor of Dr. Grandin. The Temple Grandin Center for Equine-Assisted Therapy Research and Education will lead therapy training, research, and outreach to help people with a range of disabilities, from children with autism to military veterans with post-traumatic stress disorder. This groundbreaking center needs your support!





Equine

**Equine Sciences
Undergraduate Program**

**Equine Medicine and Surgery,
James L. Voss Veterinary
Teaching Hospital**

**Equine Reproduction
Laboratory**

Orthopaedic Research Center

To tour our equine facilities, contact:

Krystle Schaneman, CSU RamTrax, (970) 491-6846
or krystle.schaneman@colostate.edu

**To donate to equine programs and
scholarships, contact:**

Office of Advancement, College of Veterinary Medicine
and Biomedical Sciences

(970) 491-7446 or cvmbms-giving@colostate.edu

Development Office, College of Agricultural Sciences

(970) 491-0909 or CAS_VIP@mail.colostate.edu



*No hour of life is wasted
that is spent in the saddle.*

- Winston Churchill

Palomino I Photograph by Dr. Gretchen Lund, a 2013 alumna of the CSU veterinary medicine program



Colorado State University

**College of Veterinary Medicine and Biomedical Sciences
College of Agricultural Sciences**