First Patients Treated with New Accelerator at the Veterinary Teaching Hospital

After months of planning, renovating, training, and anticipation, the Varian Trilogy Linear Accelerator, the first of its kind in any animal clinic or veterinary teaching college in the world, is up and running at the James L. Voss Veterinary Teaching Hospital at Colorado State University. The first clinical cases were seen in November, with a formal ribbon cutting ceremony in December, marking the launch of the most advanced veterinary radiation oncology service in the world.

“The Varian Trilogy represents a huge leap forward for the Diagnostic Imaging Section,” said Dr. Joseph “Fred” Harmon, an Assistant Professor in the Department of Environmental and Radiological Health Sciences (ERHS). “The accelerator enables us to deliver tailored, precision radiation to tumors with a sophistication that is unequaled by any other machine available. Because of the accelerator’s accuracy, we can deliver higher doses of radiation to kill cancer cells while drastically reducing the impact on healthy tissues.”

The Trilogy has the ability to target tumors with a radiation dose that is tailored specifically to the depth, shape, and size of a tumor. Specifically, a radiation dose can be fitted to the abnormal shape of a tumor and delivered at a specific depth to prevent hitting important surrounding structures such as the spinal cord, kidneys, or heart. The beam of radiation can be sculpted because of a sophisticated “multileaf collimator,” which has 120 moving parts, each driven by an individual motor. Each part can be manipulated, and together the leaves form into hundreds of different positions to uniquely shape a beam for each tumor.

Further accuracy is enabled via a respiratory gating system that only allows delivery of the radiation beam at specific stages of the breathing cycle.

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Welcome

Dear Friends,

Welcome to the Winter 2008 edition of the ERHS Emitter Magazine. This edition is chockfull of wonderful stories about research going on here at the Department, as well as profiles of our students, faculty, and one of our alumni.

Our cover story focuses on the advances we have seen in the last several years in the Diagnostic Imaging Section. Most recently, we celebrated the arrival and commissioning of our Varian Trilogy Linear Accelerator system with a ribbon cutting ceremony. It was a simple tribute to the many people at the University who made this technological advance possible, as well as a simple tribute to an amazing machine that will change the way we are able to diagnose and treat cancer. This has benefits not only to our animal patients at the James L. Voss Veterinary Teaching Hospital, but also to human cancer patients who will have their own treatments improved by what we learn here.

Funding for the system was provided by the College of Veterinary Medicine and Biomedical Sciences, the Department of Environmental and Radiological Health Sciences, Colorado State’s Academic Enrichment Program, the University’s Animal Cancer Center, and the Colorado State University Research Foundation. Without so much support, the acquisition of this equipment would never have been possible. We can proudly say that our linear accelerator is the first of its kind in any animal clinic or veterinary teaching college in the world, and it is only available for human treatment in a few limited locations in the United States. The Varian Trilogy is taking us into a new era of cancer treatment, and we hope you’ll read more about what lies ahead.

In other news, I’d like to congratulate our Fall 2007 graduates and wish them well as they venture out into the work world, or move on to continue their education. I’d also like to welcome our new faculty members, Drs. Debi Gibbons and Angela Marolf, who are profiled on page 10. You’ll also read about a grant that Dr. Thomas Borak recently received from NASA to develop personal dosimeters for astronauts, a fascinating project that will one day wind up in space!

I hope you enjoy the Winter 2008 edition of Emitter Magazine. I welcome your questions and comments on the magazine and its contents, as well as suggestions for articles for future editions. Please drop us a line or give us a call with your input. Happy New Year and I look forward to hearing from you.

Best Regards,

John D. Zimbrick, PhD
Professor and Head
Changes in Diagnostic Imaging Section Reflect Future Directions, Technologies

Now that the Varian Trilogy Linear Accelerator is up and running, faculty members and clinicians at the Diagnostic Imaging Section of the James L. Voss Veterinary Teaching Hospital are setting their sights on the “ultimate last chess piece” they need to complete their imaging set to further enhance patient care, expand research opportunities, and advance the field of diagnostic imaging – a new PET/CT scanner.

“The acquisition of a state-of-the-art PET/CT scanner will give us new ways to detect cancer and target treatment,” said Dr. Susan Kraft, an Associate Professor in the Department of Environmental and Radiological Health Sciences and a member of the Diagnostic Imaging Section. “While cancer is our primary focus, PET/CT also is used for cardiac assessments, an area we are poised to enter into with our cardiac specialty group at the hospital. In addition, neurological diseases can be imaged and diagnosed by the scanner in different ways and with improved accuracy currently unavailable to us.”

PET stands for positron emission tomography, a technology that creates an image of the body’s biochemical activity. PET shows the rate at which the body’s cells break down and use glucose with the help of a radioisotope injected into the blood stream. Cancer cells metabolize glucose at a higher rate than normal cells, and PET scans can reveal this abnormal cell activity. CT is short for computed tomography, a technique that uses X-rays and a computer to make an image of sections of the body. CT scans can show organs, bones and tissues in much greater detail than regular X-rays. CT scans use contrast enhancing agents to produce even clearer images. A PET/CT scanner combines the two types of imaging into one unit. When the CT scan, showing bones, tissues and organs, as well as abnormal growths, is laid over a PET scan, showing abnormal cell activity, clinicians can pinpoint exact locations of abnormal cell activity even when an abnormal growth is not yet visible.

Another major technical advancement in diagnostic imaging includes conversion of all X-ray units from film to digital. Along with this conversion, a state-of-the-art Picture Archiving and Communications Systems (PACS) will allow web-based distribution of images to different users including clinicians and referring veterinarians. Additionally, a Radiology Information System (RIS) is being installed to enable a more efficient workflow through the service, an enhancement that will positively impact clinical activity.

“The combination of digital acquisition and PACS will make all images more available to users and also allow us to improve image interpretation through manipulation of the image,” said Dr. Kraft. “For example, changing the gray scale may allow us to detect problems that are harder to see.”

Storage of images has been a problem as well, with little room to preserve images older than five years. Dr. Kraft notes that with the upgrade to digital, image storage space is practically limitless.

“The Varian Trilogy, PET/CT scanner, and digital imaging upgrade are creating some unique and exciting opportunities in patient care and research,” said Dr. Kraft. “We have a lot of training to do to get up to speed with all of our new equipment, but we know it’s worth it. We have fantastic new tools in the fight against cancer and other devastating diseases. The ultimate beneficiaries are our animal patients, as well as human patients whose care will improve through what we learn here.”
When delivering doses of radiation to treat tumors, accuracy is important—not only accuracy in calculating a dose, but accuracy in positioning the patient to ensure the same location is exposed with each treatment. Positioning animals is particularly challenging as commands such as sit, lie down, and stay don’t work quite as well in a treatment setting when clinicians need to get a tumor to within 2 mm of its original treatment position.

Dr. Joseph “Fred” Harmon, an Assistant Professor and medical physicist, and Derek Van Uffelen, a student in the Freshman Scholars Program, both in the Department of Environmental and Radiological Health Sciences, are working on cranial fixation devices that will hold dogs and cats in place to ensure that their treatments provide the maximum benefit in killing cancer cells while limiting exposure of healthy cells.

“With improved accuracy, we can deliver higher doses of radiation for faster treatment, making it a lot easier on the animals,” said Uffelen, who has been working on the project since early in the fall semester. “The devices we are developing right now are for immobilizing the head when animals are undergoing therapy with the Varian Trilogy Linear Accelerator. When animals have tumors in the head and mouth, accuracy of treatment is important to protecting healthy tissue.”

The base and bridge of the fixation device are made of carbon fiber. A moldable plastic material called Aquaplast is used for a bite block to restrict movement of and position the teeth and also is used as a form of netting molded over the snout. Notches in the positioning board hold it in place on the Trilogy treatment couch. A custom fixation device is built for each patient and is used throughout their therapy since radiation treatment protocols can last several weeks.

“The Trilogy technology represents a great advance in animal care at the James L. Voss Veterinary Teaching Hospital,” said Dr. Harmon, who also is Derek’s mentor. “But the delivery of that care is only as good as the accuracy in positioning of the patient. Working with Derek on this project has been very rewarding both in terms of what we have been able to accomplish in improving fixation devices, and in terms of watching his ideas and abilities take shape and grow.”

First Patients Treated with Varian Trilogy

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“We want to have a variation of less than 2 mm, allowing us to maximize radiation to tumor tissues while minimizing exposure of healthy tissues,” said Dr. Harmon.

The Varian Trilogy is unique because it has three radiation beams with distinct characteristics, hence the name Trilogy. One beam is especially designed to administer radiosurgery, a technique where radiation can be delivered with fewer fractions than traditional radiation therapy. Radiosurgery is a new field, and veterinary cancer patients provide an ideal model to evaluate this new technology that can benefit both animal and human cancer patients. It is a particularly successful method of treatment for canine bone and brain tumors. In addition, the machine has an on-board CT scanner and digital X-ray machine, allowing veterinarians to monitor the changing shape and depth of a tumor with each treatment.

“We started out doing simple clinical cases and moved on to 3-D imaging and will look forward to doing radiosurgery in the very near future,” said Dr. Harmon. “We want to optimize the ways we use the technology and transfer that knowledge back to human clinics so that the tools become easier to use in a hospital setting. Oftentimes, what we see is this equipment not used to its full potential to benefit human patients and we think we can establish protocols that will allow human clinicians to provide the best care possible for their patients.”

Funding for the Varian Trilogy Linear Accelerator was provided in a cooperative effort by the College of Veterinary Medicine and Biomedical Sciences, the Department of Environmental and Radiological Health Sciences, Colorado State’s Academic Enrichment Program, the Animal Cancer Center, and the Colorado State University Research Foundation.
In 1943, the federal government realized the need for a centralized yet remote location to pursue nuclear weapons research in an effort to win World War II. As a result, the top-secret Los Alamos National Laboratory (LANL) in New Mexico was established. Now, 65 years later, many of the laboratory’s secrets have been declassified, but questions remain regarding the historical chemical and nuclear material releases into the environment, and the risks these materials pose to human health and wildlife habitat.

“The question we face today is not only how we should clean up Los Alamos but, at certain specific sites, if we should clean it up at all given the low levels of risk,” said Dr. Ward Whicker, a Professor Emeritus of Radiocology in the Department of Environmental and Radiological Health Sciences and principal investigator on a project known as RACER (Risk Analysis, Communication, Evaluation, and Reduction). “We are trying to develop a new approach to risk assessment that will enable us to make smarter decisions about how, where, when, and why we clean up sites, taking all stakeholder interests, concerns, and risks into consideration.”

The laboratory encompasses 36 square miles, has more than 12,500 employees, and is located in Los Alamos County in New Mexico. Most toxic materials were released into the environment years ago, when waste disposal into remote areas was an acceptable practice. In the early years, notes Dr. Whicker, the laboratory tried to operate in compliance with the rules and guidelines of the time, and yet meet urgent wartime demands.

“We are living with that legacy, and what we decide now will affect risks to human health and the environment for generations to come,” said Dr. Whicker. “Reflecting the times, the mission of Los Alamos has changed to include research into environmental contamination, including the spread of radionuclides and chemicals through the environment, and that is where our work on RACER comes in.”

RACER includes two main software tools used together for risk assessment and mitigation planning. The RACER database provides comprehensive information about concentrations of chemicals and radionuclides in the LANL environment, toxicity levels used to assess risk from chemicals and radionuclides, and data that define potential exposures (such as food habits, lifestyles, etc.). This tool also contains features that allow spatial and temporal analyses of the monitoring data, comparisons to standards and background concentrations, and many other questions of interest. The Risk Ranking Tool assesses present and future public health risk and ecological impacts from LANL-released radionuclides and chemicals, and ranks sources and pathways of risk so the most important ones can be addressed first. In the interest of transparency, these tools, when fully tested, will become available to anyone via the Internet.

“A key factor in RACER is public and regulatory input,” said Dr. Whicker. “This is a very transparent process undertaken by independent researchers and we want to address public concerns every step of the way, as well as make all of this information widely available to those who have an interest in the LANL site. We are partnering with the New Mexico Community Foundation to oversee community involvement.”

The RACER project began in 2002 and is scheduled for completion in September 2008. The project is actually performed by the Risk Assessment Corporation of Neeses, S.C., under contract to Colorado State. Dr. Whicker provides oversight and arranges peer reviews of the technical aspects of the work. He hopes that the risk assessment and mitigation tool can become a model for other sites that are struggling with the same issues regarding clean-up of hazardous materials.

“Sometimes, despite our best efforts, health risks from these sites are actually made worse by unnecessary and invasive clean up activities that also have a negative impact on cultural resources and wildlife habitat,” said Dr. Whicker. “We think a better approach is to develop an accurate risk assessment and manage sites based on facts on the ground. Ultimately, this process takes into account issues important to people who live in the region, such as health concerns, the cost to taxpayers of uncalled for clean-up operations, and the long-term environmental consequences of our decisions.”
When Dr. John Rosecrance came to Colorado State University in 2002, his charge was to develop a nationally recognized ergonomics training program. Five years later, CSU houses a NIOSH Education and Research Center with an ergonomics training program, a robust research program, and a growing body of graduate students pursuing ergonomics.

“Ergonomics is an interdisciplinary field incorporating engineering, psychology, and health sciences,” said Dr. Rosecrance, an Associate Professor in the Department of Environmental and Radiological Health Sciences (ERHS). He and Dr. David Gilkey, an Assistant Professor in ERHS, along with Dr. Peter Chen from the Department of Psychology, form the core of the ergonomics faculty. “The goals of ergonomics are to increase production efficiency, improve the quality of products and services, reduce rates of injury and illness, and improve the quality of life for workers.”

While many associate the computer age with the development of ergonomics and human factors (what happens when human expectations and abilities meet the environment), evidence indicates that Hellenic civilization in the 5th century BC used ergonomic principles in the design of their tools, jobs, and workplaces. In the 19th century, coal shovels were redesigned to improve shoveling rates, and in World War II, engineers learned how manipulating a pilot’s environment could enhance safety and reduce pilot error.

At Colorado State, the ergonomics program has a number of different areas of emphasis, but much of the research focus is in agriculture and construction, two of the most dangerous occupations in the United States. The ergonomics group has two large projects through the High Plains Intermountain Center for Agricultural Health and Safety. The first is to enhance the translation and dissemination of important health and safety findings through agricultural partnerships. The second is an injury risk analysis in large-herd dairy parlors, aimed at determining which type of parlor design is the safest and most efficient for workers (PhD candidate David Douphrate is the lead investigator on this project).

Drs. Rosecrance and Chen also have a five-year grant to investigate psychology-based health and safety training programs in the construction industry. Students in the ergonomics program participate in a variety of research projects including the use of cell phones, text messaging, hand tool design, muscle activity during violin playing, and appliance manufacturing.

Dr. Rosecrance has been a physical therapist for more than 20 years. He specializes in the treatment of occupational illnesses and injuries. Over the last 12 years, his work has focused on the prevention of occupational illnesses and injuries through ergonomics. He is a Certified Professional Ergonomist and has been a consultant in ergonomics to approximately 30 companies in the United States. Using ergonomic principles, he has worked successfully with many companies throughout the U.S. to reduce injuries, increase production efficiency, and improve the quality of products and services.

Students in the ergonomics program are studying text messaging among CSU students to learn more about the possible physical concerns of this type of repetitive motion.
Dr. Thomas Borak leads a team of researchers who have received a grant from the National Aeronautical and Space Administration (NASA) to develop a personal dosimeter for astronauts embarking on extra vehicular activity (EVA) on the surface of the moon.

“In 2004, the President issued a directive to NASA that ushered in a new era of space exploration, including a return of manned missions to the moon,” said Dr. Borak, a Professor in the Department of Environmental and Radiological Health Sciences and the dosimeter project’s Principal Investigator. “Our team responded to a NASA request for proposals to develop personal dosimeters and, based on our successful history of research in this field, was awarded the grant.”

Astronauts are exposed to higher levels of radiation in space because they are outside of Earth’s protective atmosphere which provides shielding from galactic cosmic rays and solar particle storms. NASA is particularly interested in exposure rates while astronauts are on the lunar surface during an EVA when the only protection from penetrating radiation is the space suit. These suits are in the process of a major redesign and personal dosimeters will be an integral component of the new systems.

“Personal dosimeters are important for two purposes,” said Dr. Borak. “First, the ambient background of cosmic rays is 50 to 100 times higher on the moon than the surface of the earth. These high-energy penetrating particles range from protons to iron nuclei that can be responsible for very large doses. The dosimeters must be able to monitor this large range of particles in order to make a complete assessment of exposure during normal ambient conditions. Secondly, there is the possibility of a solar particle event (SPE) resulting from a solar flare that can cause an extreme increase of intensity on the lunar surface. The dosimeter needs to be able to provide an early warning of the onset of an SPE so that the astronauts can terminate the EVA and proceed to a shelter.”

Dr. Borak said the design team faces numerous challenges. The dosimeter has to be light because every gram counts during space missions. It must be compact without compromising capabilities while maintaining restricted power consumption, since the dosimetry system will be allocated a fixed amount of power from the space suit battery pack. The data bandwidth must be able to transmit warning information to the space crew instantaneously as well as sending exposure data back to mission control with a time lag of less than five minutes. In addition to these requirements, NASA also would like the dosimeter to estimate exposures to the skin as well as the blood-forming internal organs. This will most likely necessitate a two-part dosimeter; one deep inside the equipment backpack and one near the surface of the space suit.

“We are confident that we can make a significant contribution to space dosimetry and to radiation dosimetry in general,” said Dr. Borak. “NASA would like our final design developed and tested in four years, and we are excited to get started.”

Dr. Borak’s laboratory is partnering with the NASA/Aims Research Center, Texas A&M University and Lawrence Berkeley Laboratory on the dosimeter project. The EVA dosimeter grant is being administered by the National Space Biomedical Research Institute. He also noted that much of the work being undertaken today would not have been possible without all the efforts of his students over the years.

“Several years ago we were selected as a NASA Scientific Center of Research and Training (NSCORT). We used this opportunity to begin studying how dosimeters respond to galactic cosmic rays, working on project after project, learning piece by piece about these important issues,” said Dr. Borak. “We’ve come to understand limitations of dosimetry techniques and how we can optimize the technology. Our graduate students have worked with us step by step, making the contributions that eventually allowed us to receive this grant.”

Students working on NASA projects in Dr. Borak’s laboratory were Ryan Alexander, Jason Dunaivant, David Farrar, Brad Gersey, Steve Guetersloh, Steve Rademacher, Phil Taddei, and Jill Weber.
Health Physics Takes Grad from Rocky Flats to Rocky Top

Health physics was not high on Sarah Roberts’ list of majors when she went off to receive her higher education – in fact, she had never really heard of the field. But while in school, a work study assignment introduced her to a new world of dosimeters, bioassays, and radiation research that would open the door to a fascinating career.

Roberts grew up in Ohio and attended Ohio University where she received her Bachelor of Science degree in biology. While in school, her interest in radiology was piqued when she worked as a work study student for the university’s radiation safety officer.

“I didn't know much about radiation but I was soon collecting, analyzing, and calculating bioassay samples, conducting surveys of campus laboratories, doing thyroid counts, and I just found it fascinating,” said Roberts. Her boss encouraged her to apply for an Applied Health Physics Fellowship through the Department of Energy, for which she was selected. She could pick one of 20 programs nationwide and, having never been to Colorado but feeling adventurous, Roberts selected Colorado State University.

“Dr. Tom Borak was my advisor and he was a little concerned because I got a C in the only physics course I took as an undergraduate,” said Roberts. “So he wanted me to take some additional courses before I started the program. That really motivated me to prove myself and I wound up getting As in both of his classes. I had never studied that much in my life.”

Upon graduation in 1993, Roberts got her first “real job,” working to decommission the Fort St. Vrain Nuclear Power Plant in Colorado. After that, she went to work at another decommissioning, the Yankee Rowe plant in rural Rowe, Mass., as well as at the Yankee plant in Connecticut. She returned to Colorado in 1999, where she worked at the Rocky Flats Environmental Technology Site (renamed after the focus became clean-up rather than weapons production). Roberts worked at the site until 2005 when the clean-up was declared complete. (In 2007, the Environmental Protection Agency announced it had certified the cleanup of the former Rocky Flats nuclear weapons plant, another step toward the planned conversion of the site to a permanent wildlife refuge).

Roberts is now at the Oak Ridge Institute for Science and Education (ORISE), founded by the Department of Energy in 1992 with programs dating back to 1946. ORISE is managed by Oak Ridge Associated Universities (ORAU) for the DOE. ORISE’s missions include strengthening the nation’s research and development enterprise through education and research participation programs; ensuring the readiness of the nation to respond to terrorist incidents and other emergencies; and protecting workers, the public, and the environment through research, outreach, and verification activities. Roberts, who is a Certified Health Physicist, is primarily involved in verification and was recently promoted to Survey Projects Manager in the Independent Environmental Assessment and Verification group at ORAU.

“We provide radiological surveys and environmental assessments for the U.S. Department of Energy (DOE), Nuclear Regulatory Commission (NRC), and various state governments,” said Roberts. “We verify the clean-up is completed to the standards required, and we work to support the successful decontamination and decommissioning of sites throughout the United States. The field changes as technology and knowledge change, but the ultimate goal is always the same: to ensure that sites meet the standards established in the clean-up management plan.”

Roberts notes that for someone who came into the field almost accidentally, she enjoys her work immensely and hopes to be at ORAU for many years – especially after working so hard in those physics classes.

“The field changes as technology and knowledge change, but the ultimate goal is always the same: to ensure that sites meet the standards established in the clean-up management plan.”
In 1989, the United States experienced a large outbreak of a disabling autoimmune illness called eosinophilia-myalgia syndrome (EMS). More than 1,500 individuals across the country were afflicted with the rare disease, which caused at least 37 deaths. Epidemiological studies pointed toward L-tryptophan, a sleep aid supplement widely available in health stores. For Dr. Arthur Mayeno, the mysterious cases of EMS were an introduction to the world of toxicology.

“I was at the Mayo Clinic in Rochester, Minnesota, conducting post-doctoral research when the opportunity came to apply my organic chemistry experience to analyze case-associated lots of tryptophan to identify possible impurities that could have caused the illness,” said Dr. Mayeno, who is a Research Assistant Professor in the Department of Environmental and Radiological Health Sciences (ERHS). “Researchers from all over the United States and other countries worked together to try to understand what went wrong.”

After 1991, when most tryptophan was banned, the numbers of EMS quickly declined. Researchers had discovered a number of impurities that could be potentially associated with the illness, but the definitive cause is still under investigation. For Dr. Mayeno, the experience would help to shape his future career. (The FDA has since allowed the sale of L-tryptophan.)

A native of Los Angeles, Dr. Mayeno attended UCLA, where he majored in math and biochemistry before transferring to Cornell University, where he graduated with a degree in chemistry. He returned to UCLA to attend graduate school, working with Dr. Christopher S. Foote, who ignited Dr. Mayeno’s interest in the application and importance of organic chemistry in understanding the mechanistic basis of biological and biochemical phenomena. Upon receiving his PhD, he worked with Dr. Gerald J. Gleich at the Mayo Clinic before entering the private sector, first at Pharmacia and then Upjohn (later acquired by Pfizer) and Merck. After working in the pharmaceutical industry for some years, primarily as an analytical chemist, Dr. Mayeno decided to return to an academic setting and joined Dr. Raymond Yang’s research group as a post-doctoral fellow where his focus was on learning computational toxicology. In 2005, he successfully competed for a K25 Career Development Award from the National Institutes of Health and joined the ERHS faculty. The five-year award is designed to allow the sale of L-tryptophan.

“All biological organisms are sophisticated super-chemists,” said Dr. Mayeno, “If we want to understand that chemistry, we need computational chemistry, where complex problems can be defined systematically, and where calculations and predictions are more accurate and lightning fast relative to hand calculations.”

While the main focus of Dr. Mayeno’s work is in xenobiotic metabolomics, he also participates with other researchers in the Quantitative and Computational Toxicology (QCT) Research Group, directed by Dr. Yang. Most recently, the group (with Dr. Reisfeld as Principal Investigator), was awarded an EPA STAR grant to develop computational tools to interpret biomarkers indicative of human exposure to organophosphorus insecticides.

In addition to his research work, Dr. Mayeno enjoys working with undergraduate and graduate students in a variety of programs, and takes great pride in their accomplishments. Most recently, Caitlin Brown, a former student of Dr. Mayeno’s who graduated last spring, was the first author of a review paper accepted for publication in the journal Drug Metabolism Reviews.

“I remind students that they should try to find a career that will make them happy and show them that they can make a difference in the world,” said Dr. Mayeno.
NEW FACULTY

Dr. Angela Marolf

Dr. Angela Marolf has joined the Department of Environmental and Radiological Health Sciences (ERHS) as an Assistant Professor in the Diagnostic Imaging Section. She graduated from the University of Colorado in 1996 with a Bachelor of Arts in environmental, population, and organismic biology; and received her DVM from Colorado State University in 2002. She then completed an internship at the University of Georgia, College of Veterinary Medicine, in Small Animal Medicine and Surgery.

In 2003, Dr. Marolf joined the Polo Spring Veterinary Hospital where she was an associate veterinarian. She began her residency in radiology at the University of Florida, College of Veterinary Medicine and transferred to Colorado State University in 2006. She earned status as a Diplomate of the American College of Veterinary Radiology and joined the ERHS faculty in 2007.

Dr. Marolf is a member of the American College of Veterinary Radiology, the American Veterinary Medical Association, and the Colorado Veterinary Medical Association. Her honors and awards include being an inducted member of the Society of Phi Zeta and the Society of Pi Beta Kappa, as well as several undergraduate and PVM scholarships.

Dr. Debi Gibbons

Dr. Debi Gibbons has joined ERHS as an Assistant Professor in the Diagnostic Imaging Section. Dr. Gibbons is a graduate of the PVM program at Colorado State University, where she also received her Masters of Science in diagnostic imaging. In addition, she completed an equine ambulatory internship at North Carolina State University’s College of Veterinary Medicine.

Prior to her faculty appointment at Colorado State University in 2007, Dr. Gibbons owned and operated a mobile diagnostic ultrasound and imaging consultation practice in the Dallas/Fort Worth area. She also served on the staff of Animal Imaging, a veterinary imaging center providing outpatient services. After receiving her master’s from CSU, Dr. Gibbons worked for Diagnostic Imaging, a mobile service based in Aurora, Colo., Valley Veterinary Imaging in Scottsdale, Ariz., and Arizona Veterinary Specialists.

Dr. Gibbons is a member of the American College of Veterinary Radiology, American Veterinary Medical Association, as well as the veterinary medical associations of Arizona, Colorado, Denver Area, Tarrant County, and Dallas County.

ERHS Calendar

April 15 – Celebrate Undergraduate Research and Creativity (www.curc.colostate.edu)

April 12 – CSUnity Day, campus-wide volunteer event (www.colostate.edu)

April 29 – Celebrate Colorado State luncheon

May 16-17 – Colorado State University Spring Commencement (www.colostate.edu)

May 31-June 5 – American Industrial Hygiene Association Annual Conference, Minneapolis, Minn., www.aiha.org

June 22-25 – National Environmental Health Association Annual Education Conference and Exhibition, Tucson, Ariz., (www.neha.org)

Mark Your Calendars for CSUnity, Saturday, April 12

The Environmental Health Alumni Group will participate once again in CSUnity, a day where hundreds of CSU students and alumni volunteer in throughout Larimer County on a variety of community works projects. CSUnity is slated for Saturday, April 12.

Once again this year, members of the Environmental Health Alumni Group will be partnered with students in the Environmental Health Student Association for a second project at Horsetooth Mountain Park. The volunteer assignment will last from 11 a.m. to 2 p.m., followed by a picnic. Family and friends are welcome! To sign up, contact Erin Reichert at erin.reichert@colostate.edu or (970) 491-7910.
As the alligator head enmeshed in plastic wrap, bolts, boards and wires is passed around the room, Freshman Scholar Derek Van Uffelen explains the challenges of developing holding devices that will accurately position animals for radiation therapy. His presentation is just one of five from students participating in the Freshman Scholars Program (but definitely the only one featuring an alligator head).

Dr. David Gilkey, an Assistant Professor in ERHS, is the faculty coordinator of the Freshman Scholars Program. At the beginning of the year, students rotate through a variety of laboratories and then select their home laboratory. This year’s Freshman Scholars, along with their projects and mentors, are:

1. Derek Van Uffelen is working with Dr. Joseph “Fred” Harmon, Medical Physicist, to develop and evaluate devices to hold animals while they receive medical procedures/treatments such as radiation therapy.

2. Laura Bernhardt is working with Drs. John Rosecrance and Marie Legare performing electromyography on musicians to evaluate the effect of posture and forces associated with specific instruments. Results may challenge the conventional methods and form recommended for playing specific instruments.

3. Katriana Popichak is working with Dr. Ron Tjalkens to evaluate molecular and imaging approaches for assessing dysfunction in cultured neural cells and animals. She is investigating causes of Parkinson’s disease, as well as treatments and prevention.

4. Alainna McPhaul is working with Drs. Jennifer Peel and David Gilkey to evaluate risk factors for back pain among college students at CSU. She is managing and analyzing data from a large survey to help identify causes of back pain and injury, and develop prevention strategies for young people to avoid the condition.

5. Angela Coler is working with Dr. Tom Johnson to evaluate health risks of uranium mining, researching and documenting exposure limits to various waterborne chemicals and radionuclides.

This year’s Freshman Scholars are (from left, back row) Laura Bernhardt, Katriana Popichak, (front row) Derek Van Uffelen, Alainna McPhaul, Angela Coler, and Dave Gilkey, faculty coordinator.

ERHS Senior Ambassador of Undergraduate Program

As a senior graduating in the spring of 2008, Vanessa Capestany is in an enviable position not uncommon to many undergraduate students in the Department of Environmental and Radiological Health Sciences. A summer internship has turned into a permanent position that will take her straight from the graduation platform to the offices of the Naval Facilities Engineering Command (NFEC) in San Diego. It’s a good feeling for a student who had “absolutely no clue” what she wanted to do when she came to Colorado State University as a freshman.

“I came to CSU originally because they offered me the best financial package,” said Capestany, who will graduate with a major in environmental health and a minor in food safety. “As part of the CSU core academics program, I took the EH110 class taught by Dr. Dave Gilkey, and I just loved it.”

Capestany found herself drawn particularly to water quality, an interest she was able to explore in her NFEC internship. Through the Student Career Exploration Program, she worked at the San Diego Naval Base focusing on quality assurance. This included inspections of both Naval and Marine installations to ensure they were up to code with EPA and RCRA regulations, especially the Clean Water Act and the Clean Air Act. She was involved with research on lead and asbestos, munitions response, the effect of residuals on groundwater on firing ranges, and prevention protocols.

After her summer internship, Capestany continued her work with NFEC, operating as the Command’s student liaison for the state of Colorado. She returned to San Diego for a month during Christmas break, and will move to San Diego after graduation where she will participate in a two- to three-year postgraduate internship before applying for full-time status.

In addition to her work for NFEC, Capestany is heavily involved in the Greek community as president of the Latino-based Phi Lamda Chi sorority and with El Centro, part of Hispanic Student Services. She volunteers with Triunfo, providing tutoring for high school and elementary students. She serves as Professional Development liaison for the Environmental Health Student Association and works part time at CSU’s Student Financial Services as a financial aid counselor.
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