INSIGHT

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College of Veterinary Medicine and Biomedical Sciences

Colorado State University

Researchers Study Melatonin for Possible Anti-Cancer Properties

Almost daily, the popular press bombards us with information on the miraculous properties of yet another dietary supplement. Remember fish oil capsules, garlic pills, oat bran, St. John's Wort, and ginseng? Sometimes the hype is well earned and well-documented, as in the use of St. John's Wort to treat mild depression. Clinical studies proved the efficacy of this treatment. But often, the hoopla is based on little more than anecdotal evidence – remember the use of bee pollen to prevent hair loss?

Then there is the interesting case of melatonin, a chemical produced naturally by the body. Proponents claimed melatonin supplements could improve sleep patterns, especially in cases of jet lag. Among its other suggested benefits were improved mental acuity, higher energy levels, and decreased anxiety. Melatonin quickly shot to supplement stardom, like so many before it. Soon though, it was off the front page and overstocked on grocery and health food shelves, victim to the next supplement fad. But melatonin proponents seemed to be on to something.

Today, at the College of Veterinary Medicine and Biomedical Sciences' Department of Environmental Health, and at other research laboratories around the world, melatonin is getting a closer look. In laboratory tests, melatonin is exhibiting a powerful antioxidant property, encouraging researchers to look at how melatonin may work as a protectant against cancer.

Dr. Greg Cosma

"In the research work we are doing, we are seeing melatonin exert a very potent antioxidant effect on cells," said Dr. Greg Cosma, an assistant professor in the Department of Environmental Health. "We have been able to

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Inside This Issue

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Researchers Study Melatonin (continued from page 1)

perform actual analysis of the free radicals that melatonin inhibits."

Dr. Cosma has long been interested in understanding the underlying biology and the role of oxygen-free radicals in cancer. Most of his work examines the effect of environmental toxicants and oxidative injuries that produce damage to a cell's DNA. Oxygen-free radicals are being fingered as a leading cause of heart disease, stroke, cancer, and a number of other illnesses.

"Oxygen-free radicals are a highly reactive chemical species that are a derivation of oxygen," Dr. Cosma said. "They undergo chemical reactions to produce these reactive oxygen species. These oxygen species are highly reactive with cell membranes, DNA, and other cell proteins. When they react with these components they often destroy them."

Dr. Cosma said that the aerobic environment has evolved protective mechanisms to get rid of oxygen-free radicals. In addition, some dietary supplements, including Vitamin E and Vitamin C, have an antioxidant effect that gets rid of the free radicals before they produce toxic compounds. As a toxicologist, he was interested in toxic agents, but also interested in identifying protective agents. Dr. Jim Burch, a colleague of Dr. Cosma's and an epidemiologist, persuaded him to look into melatonin as an antioxidant.

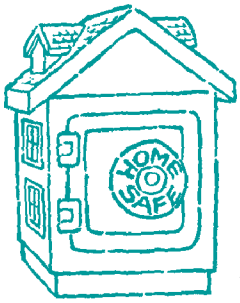
"We were somewhat limited because these molecular studies require analytical expertise that is very involved with chemistry," Dr. Cosma said. "At the time, we were working on these studies with the National Institute for Occupational Safety and Health and they suggested incorporating an analytical scientist."

Dr. Lun-Yi Zang was brought into the project to perform essential analysis of free radicals. Dr. Lun-Yi Zang uses Electron Paramagnetic Resonance to detect oxygen-free radicals and can actually see via computer what is happening to the free radical when melatonin is introduced.

"What we see is that melatonin has the direct ability to scavenge certain free radicals," Dr. Cosma said. "That may or may not be tied to other effects that can present in a certain number of disease states. But it is exciting enough for us to continue to pursue our studies."

Dr. Cosma said it is too early now to recommend individuals take certain doses of melatonin, as the full report is not in. Additionally, like any other supplement, melatonin can actually be toxic in high dosages. But the initial studies are encouraging and warrant further investigation. As the research group gets a firmer grasp on the biology of melatonin, Dr. Cosma sees a natural move to human population studies.

HomeSafe Tackles Residential Construction Safety



If you're interested in a really dangerous occupation, forget about becoming a fighter pilot, police officer, or lion tamer. The real, everyday dangers lie in those occupations we don't tend to equate with risk. It might surprise you to learn that the top three most hazardous occupations per capita in the United States are mining, farming, and construction. Then again, if you've visited a construction site lately, those facts may not come as such a shock. They certainly don't surprise Dr. Phil Bigelow, a Colorado State University assistant professor working to improve safety conditions for construction workers.

"Construction sites, especially residential ones, are very hazardous," said Dr. Bigelow, a faculty member with the Occupational Health and Safety Section in the Department of Environmental Health, College of Veterinary Medicine and Biomedical Sciences. "When we look at the dangers workers are exposed to, it's easy to see why construction is one of the most hazardous occupations in this country."

Through a pilot program called HomeSafe, Dr. Bigelow is part of a team of researchers, government agencies, and private businesses with a mission to change construction's safety record and reduce the number of deaths and injuries suffered on residential construction sites. At the heart of HomeSafe is a new set of simplified regulations set out in a small booklet making it easier for contractors and workers to understand and practice safety. Denver is the test site for the pilot program, jointly created by the Home Builders Association of Metro Denver and the U.S. Occupational Safety and Health Administration. Colorado State University helped in the design of the program

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HomeSafe Tackles Safety (continued from page 2)

and will provide analysis for the first three years to determine the effect of the program on worker safety.

"Residential contractors have always had to follow OSHA's three-inch thick manual that governs job-site safety, a manual geared largely toward commercial construction," Dr. Bigelow said. "The booklet developed by HomeSafe helps workers and employers understand basic safety issues, and implement simple safety practices that should help save lives."

The booklet is pocket-sized, easy to understand, and available in Spanish and English. It covers a variety of the major safety concerns, including personal protective equipment, power tools, falls, ladders and scaffolding, excavation, and trenching.

"Falls are one of the biggest dangers for construction workers. Running close seconds are excavation and trenching, and electrocution," Dr. Bigelow said. "OSHA wanted to work with homebuilders to put a stop to the senseless number of fatalities. In reinventing itself, especially in moving away from a monetary fine system, OSHA decided to focus on the outcome rather than the process."

The pilot program is fairly simple. If builders agree to focus on 10 basic safety provisions, OSHA backs away from using monetary fines for enforcement. Contractors must first complete a safety training course, and then provide training to each of their employees in HomeSafe's safety program. Dr. Bigelow and members of his research team at Colorado State are monitoring the program to determine its success. After three years they will compile their results, and report back to OSHA and the Homebuilders Association of Metro Denver. If the pilot program proves successful, it could move nationwide. Other members of the Colorado State research team, all with the Department of Environmental Health, are Drs. Robert E. Herron and Thomas J. Keefe, co-investigators on the project, and graduate students David P. Gilkey, Joe Tessari, Scott Greenstein, and Shiela Stanley. Additional members are Jim Dixon, with Manufacturing Technology and Construction Management, and Robert Fast of the Denver Center for Extended Studies.

"This is such an exciting program to be a part of," said Dr. Bigelow. "What we're doing with OSHA, and with the homebuilders through HomeSafe, may save a lot of lives. It feels really good to be a part of that."

Dr. Phil Bigelow

Professor Works to Make Workplaces Safe

When Dr. Phil Bigelow drives around town looking at construction sites, the meaning of his life's work is abundantly clear – improve worker safety and save lives. The construction industry is particularly dangerous and Dr. Bigelow is intent on making it safer.

Dr. Bigelow, who is originally from Vancouver, Canada, received his bachelor's degree in kinesiology from Simon Fraser University. In 1983, he received his master's degree in Occupational Health and Safety, and Environmental Health from the University of Toronto. In 1993, he graduated from the University of Calgary with a Ph.D. in Community Health Sciences with a specialization in Epidemiology. He joined Colorado State University in 1992 as an assistant professor in the Department of Environmental Health.

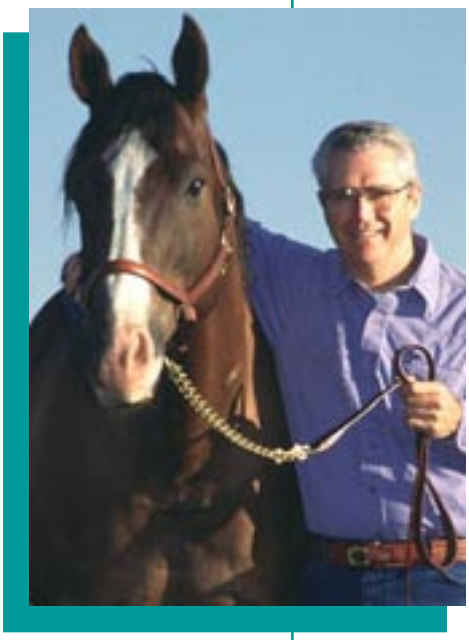
Dr. Bigelow has worked in private industry, and with universities and government laboratories, focusing primarily on worker health and safety.

"I began working in health and safety in 1983, after I received my master's degree," Dr. Bigelow said. "What I quickly began to realize is that in most industries there are large risks that can be successfully addressed. It's exciting to me to be involved in a field where what you do is directed at big problems, and where there is a lot of room for improvement."

Dr. Bigelow belongs to numerous professional organizations including the Society for Epidemiologic Research, American Industrial Hygiene Association, American Conference of Governmental Industrial Hygienists, American Academy of Industrial Hygiene, and the Environmental Education Foundation. He is certified in the Comprehensive Practice of Industrial Hygiene and in Occupational Hygiene.

"When we look at the dangers workers are exposed to, it's easy to see why construction is one of the most hazardous occupations in this country."

Message from the Dean



Dr. James L. Voss

For all the support we have received this year, I want to say thank you.

Dear Friends,

When I look back on 1997, two major events stand out – The Great Flood of 1997 and the Blizzard of 1997. Both had a huge impact on Colorado State University and the College of Veterinary Medicine and Biomedical Sciences. Because of these two natural disasters, we had to rebuild a portion of our infrastructure and academic collections, in addition to continuing to build our programs. It was a year of memorable events, extraordinary gifts, and tough losses.

The deluge of rain and the resulting flood that hit Fort Collins on July 28, 1997, exacted a heavy toll from the University. The College was very fortunate. The majority of its facilities and operations were not impacted by the flood waters. The Lory Student Center and Morgan Library were the hardest hit, with the Library losing a substantial portion of its collection to the mud, water, and debris of the flood. The campus recovered quickly, thanks to the combined efforts of faculty, staff, students, volunteers, and companies hired to assist in the clean-up and rebuilding efforts. Though much work remains to be done, and some irreplaceable things will never be salvaged, the recovery at Colorado State has been nothing short of amazing. Efforts are still underway to rebuild the Library's collection (see "Flood Recovery Efforts Continue" on page 7), but the outpouring of support from the community, state, our alumni, and friends has made the hard work easier, faster, and friendlier.

When the weather changed in the fall, so did the nature of our disasters. This time it was a blizzard, and this was a blizzard with a force many of us had never seen. We weren't so fortunate at the College this time, and we didn't escape unscathed. The weight of the snow on the Adams-Atkinson Arena caused its roof to collapse, damaging the stalls and main arena. We've set up temporary corrals and a portion of the damage will be covered by insurance, so we hope to have the arena up and running soon.

In spite of these two events, 1997 was also a great year for the College. We embarked on several new building projects – totaling nearly $6 million – and they will enhance the research, service, and teaching missions of the College. These projects include the new biocontainment facility at the University's Foothills Research Campus, the Equine Reproduction Laboratory, and the renovation of the Arthropod and Infectious Diseases Laboratory. In addition, we began an intensive program to incorporate technology into the curriculum. We have six teams of faculty developing computer-assisted, and some virtual, classes. This work is supported mainly through an award from the Colorado Commission on Higher Education which recognized the Professional Veterinary Medical program as a CCHE Program of Excellence last year.

We also had a number of outstanding gifts to the College this year. The Lucy Whittier Foundation pledged $1 million to the Preservation of Equine Genetics program to improve the horse industry and equine reproduction efficiency. This donation will enable us to bring equine researchers from around the world to Colorado State to assist in ongoing research, as well as aid in the development of new techniques and tools that will enhance equine reproduction. Hadley and Marian Stuart, longtime friends and supporters of the College, donated $750,000 to create a Professorship in Clinical Oncology. Because of this gift, our oncology program, already one of the best in the nation, will now be able to do even more in the field of cancer research and companion animal cancer treatment. The Report on Private Giving for 1996-1997 is included in this edition of Insight and details the gifts the College received during the past fiscal year.

For all the support we have received this year, I want to say thank you. To those who have stood by us – our faculty, staff, students, alumni, benefactors, and friends – we value your contributions and friendship more than you will ever realize. I hope you have a wonderful 1998, and I look forward to hearing from you soon.

With Best Regards,

Jim Voss

James Voss, D.V.M., M.S.
Dean

Thanks to Generous Support, PEG Program Galloping Ahead

At Colorado State, a very special pregnant mare is receiving a lot of attention. Researchers are monitoring her pregnancy carefully, and waiting out the months impatiently, very much like expectant parents. Watch out if these folks ask you to ante up a buck for the baby pool though; they have the inside track.

The mare is the first horse ever impregnated using a procedure to sex X- and Y-bearing sperm. The mare was inseminated into the oviduct with the selected sperm and is well into her pregnancy. This research project is just one of many scientific endeavors underway under the umbrella of the Preservation of Equine Genetics (PEG) Program, dedicated to developing new techniques that enhance reproductive efficiency in mares and stallions.

The semen sorting research is a joint project of PEG and XY, Inc., a company formed in cooperation with Cytomation, Inc. and the CSU Research Foundation. Dr. Mervyn Jacobson is its Chief Executive Officer and Dr. George Seidel is the lead investigator on the project as well as Scientific Director of XY, Inc. If the project is successful in efforts to sex horse and cattle semen on a commercial scale, it will have a major impact in both industries.

"Certain breeds prefer certain sexes, and certain individual animals do better with certain sexes," said Dr. Edward Squires, director of PEG and a faculty member at the CVMBS Animal Reproduction and Biotechnology Laboratory. "For example, you may have a mare who has the ability to have good colts – better colts than fillies – and that would be a great advantage to breed for the colts. More generally, in most horse breeds few colts are worthy of stud stallion, and in most cases it is more preferable to have a female. But in race horses, a male is more aggressive and less timid in the starting gates. In the cattle industry, dairy farmers want females and beef producers want males. So there definitely are some major economic benefits to being able to sex semen and select the sex of the offspring."

Right now, the technology to sex semen is not practical for the commercial market. Semen is collected from the stallion and put through a flow cytometer cell sorter. It takes quite a bit of time to sex the millions of sperm needed for insemination. To breed a mare normally takes 500 million sperm, with the cytometer sorting at the rate of 1 million an hour. Researchers are looking at ways to reduce the number of sperm necessary, including placing the sperm directly in the oviduct rather than the uterus.

"As we go down this research path and others that will have a profound impact on equine reproduction, we see how important the support of PEG is to the continued improvement of our science, our research tools, and the overall success of our goals," Dr. Squires said. "To that end, the support has been tremendous."

Eleven benefactors have agreed to provide funding for the PEG Program over the next five years. These benefactors, who also serve on the PEG Advisory Board, include: Arnold and Audrey Fisher, Dunromin' Arabians, Pine Plains, NY; Neil and Barbara Chur, Strawberry Banks Farm, East Aurora, NY; Alan and Deborah Mihaloff Kirshner, Cre-Run Farm, Montpelier, VA; Sue and Wes Dixon, Suzie Creek Arabians, Elko, Nevada; Christie and Henry Metz, Silver Maple Farm, Naples, Florida; Ms. Lucy Whittier, Las Colinas, Pilot Hill, California; Nick and Joni Mangeris, Les Beaux Chevaux, Bellvue, Colorado; Harold and Liz Green, Evergreen Arabians, Los Olivos, California; Dave and Linda Mehney, Grand Arabian Farm, Grand Rapids, MI; Morgan breeders Gail Bratz and Dr. Mervyn Jacobson, Stove Prairie Ranch, Bellvue, Colorado; and Gail Holmes and Herbert Allen, Double Dove Ranches, Longmont, CO. In addition, the Lucy Whittier Foundation made an added contribution to the PEG Program that will allow PEG to invite scientists from all over the world to Colorado State to assist in conducting research and developing the tools necessary to enhance reproductive efficiency and success in horses.

Other research work underway at PEG includes: GIFT, where an egg from a donor mare is placed in another mare and fertilized; in vitro fertilization; collection and maturation of eggs; refinement of techniques used in freezing semen; additional attempts to produce more foals this year using intracytoplasmic sperm injection (ICSI); and development of techniques to freeze equine embryos.

"There has never been a more exciting time in horse breeding," Dr. Squires said. "The assisted reproductive technologies that have been developed in cattle and humans in the last decade will now be developed in the horse through the PEG Program and the generous support of these horse breeders."

By the way, as far as that baby pool goes? Put your money on a filly. There's a 90 percent chance the X-bearing sperm used in the insemination will successfully produce a female.

"There has never been a more exciting time in horse breeding. The assisted reproductive technologies that have been developed in cattle and humans in the last decade will now be developed in the horse through the PEG Program and the generous support of these horse breeders."

Center Focuses on the Very Small

Dr. John Chandler pulls an image up on his computer screen. It's an image that looks like a gray Martian landscape replete with abstract Christmas trees. There is an odd beauty to its barrenness, but what is it? Dr. Chandler isn't sure. The image, generated by one of the Electron Microscopy Center's microscopes, belongs to one of the Center's commercial clients and these clients require confidentiality as a way of protecting their business interests.

Dr. John Chandler works on an image at the Electron Microscopy Center.

The Electron Microscopy Center provides the service, expertise, and personnel to examine the world of the ultra-small.

"Clients from campus and local industry come to the Center to conduct structural studies, identify chemical composition of biological and material specimens, and conduct quality control and failure analysis," said Dr. Chandler, the center's coordinator. The Electron Microscopy Center provides the service, expertise, and personnel to examine the world of the ultra-small. A recent gift from the Kodak Colorado Division – a digital image acquisition system for scanning electron microscopes – has made it possible to expand Center services. The system allows images to be captured directly to a computer for analysis and manipulation, as well as for transmission over the Internet.

"Kodak has been a wonderful supporter of the center, and we appreciate their generosity," said Dr. Chandler. "They are an extremely important client for the Center, as well as contributors to our on-going efforts to provide the best in electron microscopy services."

Electron microscopes have been around for about 50 years. Prior to their development, scientists had to make do with light, or optical, microscopes. Compound microscopes, the kind we all used in high school biology classes, have sets of glass lenses at each end of a tube, causing light to bend. The first set of lenses forms an enlarged image of the sampled object. The second set enlarges that image. The best of the optical microscopes are limited to a magnifying power of about 2000 times because they cannot form images of objects that are smaller than the light waves with which they "see."

To get a higher magnification, scientists now use beams of electrons. But electron beams can't be bent by glass lenses, so electromagnetic fields made by electromagnets act as the lenses to bend the electron beams and form images. The images, however, are invisible to human eyes. To make them visible, the images are formed on a fluorescent viewing screen, a flat surface that is coated with a material that glows when struck by electrons.

There are two basic kinds of electron microscopes, both capable of magnification of 1 million times or more. In transmission electron microscopes (TEM), the electron beams are transmitted through extremely thin slices of the material being examined. In a scanning electron microscope (SEM), a thin beam of electrons sweeps back and forth over the specimen. The electrons scan the surface of the material without penetrating it, so there is no need to slice it thin. The Electron Microscopy Center has both SEM's and TEM's, the equipment necessary to make the micro-thin sample slices required by the TEM, and two photo labs for image processing.

The Center contains a research area and a teaching area, both with two electron microscopes, and a digital imaging center. Staff at the Center teach courses in electron microscopy, as well as provide commercial and University services. The Center is fee-supported and receives additional funding from the Office of the Vice President, the deans of the major user colleges, and private gifts. Operating within the Federal Cost Accounting Standards, the Center has, at any one time, 15-30 projects in progress. Instrumental in the creation of the EMC, Dr. John Rash serves as its faculty adviser. For additional information on the Electron Microscopy Center, contact Dr. John Chandler at (970) 491-1422.

Flood Recovery Efforts Continue

The Flood of 1997 exacted a substantial toll from Fort Collins and Colorado State University. Among the heavy losses at Colorado State were books and journals destroyed in the flooded chambers of Morgan Library. Many of these documents are irreplaceable, but the University is hoping to rebuild its collection with ongoing document searches and acquisitions, and donations of books and journals from alumni and friends of the University.

If you think you may have some journals for donation, particularly those relating to veterinary medicine and biomedical sciences, we ask you to please check the library's World Wide Web site for a current listing of needed documents. That address is:

http://www.colostate.edu/Depts/PR/flood/flood-damaged-journals.html

We appreciate any assistance you can give to rebuilding our collection at Morgan Library. You have our deepest thanks. If you have questions, or do not have access to the World Wide Web and would like a journal listing, contact Joel Rutstein at Morgan Library, (970) 491-1835.

Eddy Building, July 1997, one of the many campus buildings damaged by the flood.

Response to Morgan Endowment Request Incredible!

Thanks to a terrific year-end response, the College of Veterinary Medicine and Biomedical Sciences is the first college at Colorado State University to meet its initial $25,000 goal to establish an endowment fund at Morgan Library. Our gratitude and thanks go to everyone who made this achievement possible.

Last year, each of the eight colleges at Colorado State committed to raise a minimum of $25,000 to establish an endowment fund to support the Morgan Library. The College of Veterinary Medicine and Biomedical Sciences received many gifts of $50 and $100 to help reach their goal, and saw outstanding support from Colorado State veterinary graduates. If you would like to make a contribution to the endowment fund, please contact Paul Maffey, Director of Development for the College, at (970) 491-3932. Or send your donation to: Morgan Library Endowment Fund c/o Paul Maffey, Colorado State University, College of Veterinary Medicine and Biomedical Sciences, Office of the Dean, Fort Collins CO 80523-1601.

Profile of the 1997 Entering Class
Professional Veterinary Medical Program

Total Applications	**758**
Admitted	133
Men	32
Women	101
Average GPA	3.67
Average GRE	
Verbal	512
Quantitative	611
Analytical	633
Average Age	25
Age Range	19-47

Times Applied	
First	70
Second	42
Third	15
More than Three	6
Degrees Held at Admission	
Associate	14
Bachelor's	120
Master's	8
Doctoral	0

"Bond-Centered Care" Revolves Around Kinship and Kindness

ARGUS CENTER
FOR THE HUMAN-ANIMAL BOND

When we look at the bond between humans and their companion animals at the simplest level, it's quite easy to understand. Our pets want to be fed, have a good water supply, be played with, and – for many animals – cuddled and stroked. This is the human-animal bond at its base level. But that bond, in most cases, goes much further and creates relationships that have special needs, special rewards, and heartwarming consequences.

The Argus Center for the Human-Animal Bond at Colorado State University recognizes these unique relationships and is implementing a training program to allow veterinarians as well as human service professionals to become "Bond-Centered Care" practitioners. The training will enable these professionals to use bond-centered programs, protocols, and tools in their practices to benefit their clients and themselves.

"Through our work at the Colorado State University Veterinary Teaching Hospital, we have come to recognize, as have others, the intense power of the human-animal bond," said Laurel Lagoni, coordinator for the Argus Center. "The connection between people and their companion animals requires veterinarians to develop and cultivate special skills to meet the needs created by these relationships. Their clients are not just the animals they are treating for medical concerns, but also the human owners who have emotional concerns."

Recent studies conducted by the American Animal Hospital Association show that at least 70 percent of pet owners describe their pets as children. Veterinarians, said Lagoni, need to understand the intensity of these relationships and how that can positively or negatively impact their practices.

"For example, euthanasia has always been considered the worst part of a veterinary practice," Lagoni said. "It can, in fact, be a very important service to clients if done with compassion and understanding. Euthanasia has many special needs attached to it including making the decision, the procedure itself, care of the body, and owner grief. Veterinarians need to be able to help their clients through this process so that animals have a 'good death' and owners feel that their needs have been met to the greatest degree possible. 'Bond-Centered Care' gives veterinarians the tools they need to accomplish this and so much more."

"Bond-Centered Care" is built on two simple ideas – promote kinship and practice kindness. Kinship includes: promoting a culture that values animals, the human-animal bond, and related specialized services; being proactive and preventive in the areas of client education and support; and establishing an identity as a "Bond-Centered" practice. Kindness includes developing a physical environment that supports specialized services, responding to the bond, and developing a plan for self-care, team building, and the management of professional stress.

Lagoni said that where "Bond-Centered Care" is in place at the Veterinary Teaching Hospital, certain benefits are apparent, including greater client satisfaction, increased professional enjoyment of work, reduced staff turnover, and more positive client relations and case outcomes. For private practices, she believes "Bond-Centered Care" also will lead to more profitable practices, specialized identity with greater name recognition, and a unique market niche.

"There is definitely a need among animal owners for veterinarians who understand and respect their feelings, and appreciate what it takes to care for the human owners' needs as well as the animals' needs," Lagoni said. "The demand for 'Bond-Centered Care' exists and currently is not being met. Through the Argus Center, we hope to help veterinarians meet the special needs of the human-animal bond, while creating more successful practices and enhanced professional satisfaction."

The "Bond-Centered Care" training program is under development and should be available in late 1998. The program will be open to practicing veterinarians as well as current veterinary students. A human sciences component of the program will work in training human service professionals and students to use therapy animals in their practices, as well as provide counseling to clients as it pertains to special needs created by the human-animal bond. The Argus Center is a program of the College of Veterinary Medicine and Biomedical Sciences, and the College of Applied Human Sciences at Colorado State University. For more information about the Argus Center, or "Bond-Centered Care" training, call Paul Maffey at (970) 491-3932.

"Through the Argus Center, we hope to help veterinarians meet the special needs of the human-animal bond, while creating more successful practices and enhanced professional satisfaction."

Research May Lead to New Era in Cancer Drug Therapy

A breakthrough treatment that helps eliminate bone cancer in dogs may show promise in the battle against other types of human cancer, including breast cancer.

Colorado State University veterinary researchers are using biopolymers – porous, sponge-like materials that slowly deliver chemotherapy directly to cancer cells, then biodegrade – to treat a variety of cancers in dogs. A chemotherapeutic agent, cisplatin, is added to the polymer, which releases a constant dose through a patented drug-delivery system known as open-cell polylactic acid, or OPLA. Researchers hope the successful treatment of dogs with cancer using this method can be applied to treating humans with local tumors.

Drs. Stephen Withrow, chief of Colorado State's clinical oncology services, and William Dernell, assistant professor of surgical oncology, have completed preliminary studies of breast cancer in mice that show implanted polymers are more effective in eliminating local cancer than chemotherapy administered by injection, currently the most common method for cancer patients.

This study, and other research under way at the Veterinary Teaching Hospital, points to the possibility of alternative treatments for breast cancer that are less expensive and less toxic than traditional forms of chemotherapy and radiation. Withrow explained that radiation therapy costs as much as $10,000 and may produce significant side effects in some patients. But, because polymers deliver a slow but constant dose of chemotherapy to a targeted area, patients can receive a much higher local dose than they can intravenously without experiencing whole body symptoms.

"It's a unique way of attacking a tumor," Withrow said. "Based on our success in treating dogs with bone cancer using this method, we are now focusing on how we can apply our findings to breast cancer, which is the leading cause of cancer death among women aged 40 to 55, causing more than 40,000 deaths in the United States annually." Withrow and Dernell believe polymers could eventually serve not only as a vehicle to deliver chemotherapy, but to administer antibiotics and even hormones to encourage tissue regrowth in a timed sequence of releases.

"This opens a wide range of possibilities in developing new drugs to fight cancer and heal the body from the inside without producing the toxic effects of traditional chemotherapy and radiation," Dernell said. "There's still a lot we don't know and we have a long way to go, but these studies represent a promising new direction for available cancer treatments."

Withrow, Dernell and other members of the oncology research team base their premise on the Animal Tumor Center's success in treating dogs with osteosarcoma, a bone disease that often results in limb amputation and death. Today, surgeons remove the diseased bone and replace it with healthy bone, then implant several pieces of the chemotherapy-rich polymer (developed by Colorado State veterinary researchers in conjunction with a private biomedical firm) before closing the wound. About 30 percent of dogs that receive limb sparing surgery and polymer chemotherapy experience local recurrence after one year, compared to 60 percent local recurrence in dogs that do not receive the polymer. More than 200 dogs with a variety of cancers, including osteosarcoma and soft tissue tumors, have received this breakthrough treatment at Colorado State's world-renowned oncology unit since 1986.

"This opens a wide range of possibilities in developing new drugs to fight cancer and heal the body from the inside without producing the toxic effects of traditional chemotherapy and radiation."

Drs. William Dernell (left), and Steven Withrow (right)

"Many of the treatments we develop for cancers in dogs have direct applications to treating cancers in humans," Withrow said. "We hope this technique will prove to be a useful and novel treatment in the fight against cancer and that it may lead to a whole new era of cancer drug therapy."

Class Agents System a Success

Two years ago, the College began a major effort to create a functioning and active class agent system for graduates of the Professional Veterinary Medical Program. The response from our D.V.M.s has been terrific. We have class agents for most years. The exceptions are the years 1944, 1946, 1988, 1995, and 1997. Any takers? If so, let us hear from you!

Class agents help coordinate reunions on a five-year basis, as well as assist in fundraising efforts for the class scholarship fund during milestone years. We want to take this opportunity to recognize each of our class agents, to thank them, and to draw your attention to the scholarships that a number of classes are sponsoring. If you are interested in contributing to a scholarship, creating one for your class, or volunteering to become a class agent, contact Paul Maffey, CVMBS Director of Development, at (970) 491-3932, or via e-mail at: pmaffey@vines.colostate.edu

Year	Class Agent
1944	D.V.M. Class of 1944 Scholarship
1945	Warren Walker, K.R. Wilcox D.V.M. Class of 1945 Scholarship
1947	John Carney
1948	Bob Shideler, William Beer
1949	Thomas Hagan
1950	Ben Konishi, John K. Emerson, Jr. D.V.M. Class of 1950 Scholarship
1951	Earl Drake
1952	Rex Hinshaw, Arthur Clair Lee
1953	Glenn Severin, William Long Dr. Marck U. McKie Memorial Scholarship
1954	Robert Snyder
1955	Fred Roberts
1956	Wayne Smith, Robert Felker, William Trefz
1957	Gene Carter, Richard Haines, Vern Smith
1958	Al Seawell, Darrell Farmer
1959	Cleon Kimberling
1960	Joe Jeffrey
1961	Bill Krause, Jack Swearingen D.V.M. Class of 1961 Scholarship
1962	Jack Makens, George Dewell D.V.M. Class of 1962 Scholarship
1963	Bill Quist D.V.M. Class of 1963 Scholarship
1964	Wayne Crowell, Jack Schmitz D.V.M. Class of 1964 Scholarship
1965	Wayne Cunningham, Steve Holzman, Bob Strand D.V.M. Class of 1965 Scholarship
1966	John Lyle, Bille Cole, Douglas Brooks Dr. Earl Turner, Class of 1966, Memorial Scholarship
1967	Michael Collins, Richard Winward
1968	Ronald Mannis D.V.M. Class of 1968 Scholarship
1969	Jim Hailey D.V.M. Class of 1969 Scholarship
1970	Michael Kirk
1971	Sylvia Newmann
1972	Bob Turrou
1973	Joe Alexander, John Heideman
1974	Tom Catanzaro, Vernon Reif
1975	Brian Golden
1976	David Fong
1977	David Morehead, Earl Carlson
1978	Greg Schick
1979	Robert Mortimer
1980	Ann Brandenburg-Schroeder, Kevin Dennison, SusanWhitmore, David Lassen
1981	Gwendolyn Furst, Tony Woodward
1982	Peter DeWaal, Doug Coffman
1983	Kevin Fitzgerald, Michael Matz
1984	Bill Stonehocker
1985	Sue Tornquist, Janice Manning, Richard Lamb
1986	Cindy Heiller, Doris Tucker, Liz Whitney, Michelle Behrendt
1987	Mary Carlson, Jean Arnold, Roger Van Andel
1989	Melani Poundstone
1990	Kris Muscari, Brian Loudis, Laura Banks, Sue Skelding
1991	Wendy Pott
1992	Roberta Boyden, Linda Miner, Jeannie Poulson
1993	John Glawe Gary Brett Williams Memorial Scholarship Dr. Timothy Dwayne Muhr Memorial Scholarship
1994	Gary Hogge
1996	Matt Takara
1998	The D.V.M. Class of 1998 also has established a class scholarship.

Students Win National Awards

Dr. Martha Vela-Acosta and Don Ewert, both graduate students in the Department of Environmental Health, Occupational Health and Safety Section, have received national awards that recognize their academic excellence and innovation in research.

"Dr. Vela-Acosta and Don Ewert exemplify the quality of the people within the Department of Environmental Health," said Dr. James Voss, Dean, CVMBS. "These honors reflect directly upon the strong programs the Department has been able to build in a relatively short time, garnering national recognition and reputation."

Dr. Vela-Acosta, who is working on her Ph.D. in Industrial Hygiene, is the 1997 recipient of the James DeField Memorial Scholarship. The scholarship was established to honor Dr. DeField, who worked until his death in 1984 to advance the careers of young people just starting out in industrial hygiene. The scholarship, originally established with donations from individuals, is supported in large part by the Rocky Mountain Section of the American Industrial Hygiene Association (AIHA). Dr. Vela-Acosta also received a distinguished scholarship from the 3M Company at last year's national AIHA conference in Dallas.

Dr. Vela-Acosta is a physician from the city of Leon, Juanaguago, in Mexico. She came to Colorado State University six years ago, finished her masters in Epidemiology, and decided to stay to work on her Ph.D. In addition to her graduate studies, she works full-time at Colorado State's High Plains Intermountain Center for Agricultural Health and Safety dealing mostly with migrant farm workers. She eventually hopes to bring her work and educational experiences back to Mexico to benefit her own country.

"There is such a huge need in developing countries in the areas of worker health and safety, and public health," Dr. Vela-Acosta said. "Through my work here and in Mexico, I hope that I can prevent disease and injury. That seems a much better approach than coming in after the damage has been done, and trying to cure that which many times cannot be cured."

Don Ewert received the prestigious TSI, Inc./Arthur J. Abrams Scholarship at the opening ceremony of the American Industrial Hygiene Association conference, the first year the scholarship has been given to only one individual nationwide. The scholarship is awarded to non-traditional students in the field or re-entering the field of industrial hygiene, and working toward a graduate degree. It also recognizes individuals who are using innovative ideas, new methods and means, and new toxicology tools in the field of industrial hygiene.

Ewert, who is working on his master's degree, had his own industrial hygiene company that he began in the mid-1980's. When government regulations began to change who could do what, he decided to return to school to work toward his degree and toward professional certification with the national association. His undergraduate degree is in biochemistry and, long-term, he hopes to work in the field of toxicology.

"To me, this field is very exciting because of the great potential to do good," Ewert said. "There are broad problems in worker exposure, detecting and solving problems, and engineering to prevent problems at the outset. This is a rapidly growing field, and one that is essential to the health and well-being of workers, and the safety of the workplace."

Dr. Martha Vela-Acosta

"These honors reflect directly upon the strong programs the Department has been able to build in a relatively short time, garnering national recognition and reputation."

Dr. Julia Inamine Selected to Serve

Dr. Julia M. Inamine has accepted an invitation to serve as a member of the Bacteriology and Mycology 2 Study Section, Center for Scientific Review, National Institutes of Health, for the term beginning immediately and ending June 30, 2001.

Members are selected on the basis of their demonstrated competence and achievement in their scientific discipline as evidenced by the quality of research accomplishments, publications in scientific journals, and other significant scientific activities, achievements and honors. Service on a study section also requires mature judgment and objectivity as well as the ability to work effectively in a group.

Dr. Inamine is an associate professor in the Microbiology Department.

Veterinary Teaching Hospital Open House

Colorado State University's Veterinary Teaching Hospital will host an Open House on Friday, Saturday and Sunday, **April 3, 4 and 5**. Hours on Friday and Saturday are 9:00 a.m. to 4:00 p.m., and Sunday from 11:00 a.m. to 4:00 p.m. There will be exhibits, continuous tours, presentations on a wide range of topics, a petting zoo, and "mock surgery" for the children.

All events are free and open to the public. The theme of the 1998 Open House is "We Care for Them, They Care for Us." Veterinary medicine is a field that not only enhances the well-being of household pets, wildlife, and livestock, but also directly and indirectly improves the quality of life for people. The hospital is located at 300 W. Drake Road. If you have any questions, please call (970) 491-7053.

Hunting Retriever Club presents check.

The Hunting Retriever Club, Inc. presents a $1,000 check to Dr. Stephen Withrow to support the work of the Animal Tumor Center in cancer research. The Hunting Retriever Club is affiliated with the United Kennel Club and has associations throughout North America. From left to right in the photograph are Dr. D.T. Ley; Dr. Mark Powell, president of the Platte Valley HRC; Dr. Steve Withrow; Jeremy Ley; presenting the check to Dr. Withrow is Tim Boies, HRC Region 6 field representative; Dennis Rosenbach, president of the Central Rockies HRS; and Peter Spangler, with the Southern Colorado HRC.

Snoopy has his teeth cleaned.

Veterinary specialist Vicki Lynn Matteson uses an ultrasonic scaler on the teeth of Snoopy while Drs. Lynne Kesel and W. Paul Cleland, Jr., a board-certified veterinary dentist, look on. The scaler, an Odontoson-M, was a gift from the Heska Corporation, a Fort Collins-based company focused on the development and production of veterinary and animal care products designed to improve animal health and longevity. Snoopy slept through the whole procedure and emerged with squeaky clean teeth.

Calling all Aggie Haylofters!

Were you a square dancer with the Aggie Haylofters? If so, now is your chance to hook up with old friends for another do-si-do. Join us at the 1998 reunion for all dancers, team members, coaches, callers, and sponsors of the Aggie Haylofters. The reunion is scheduled for April 4, 1998.

We'll be celebrating with food, entertainment, and a chance to visit with friends and acquaintances. Of course there'll be dancing, even for those folks who haven't danced since they attended Colorado State. The reunion dance is scheduled to take place at the Lory Student Center Ballroom, Saturday evening, from 7:30 to 10:30 p.m. The Haylofters also are planning a get-together Saturday afternoon, and an after-dance coffee and dessert.

For more information and pre-registration materials, contact Greg and Michele Van Hare at 970-663-4201, or call Colorado State University Alumni Relations at 1-800-286-2586.

Continuing Veterinary Medical Education

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

March 1998

March 27-28, 1998. Sixth International Course in Small Animal Rigid Endoscopy

This course will serve as an introduction to rigid endoscopy. Laparoscopy, thoracoscopy, and cystoscopy will be covered. Instructors are Dr. David Twedt, Dr. Brent Jones, and Dr. Tim McCarthy. Fee: $575

April 1998

April 16-17, 1998. Brain Orders Demystified (Small Animal Program)

Topics covered will include seizures, neoplasia, infectious diseases, cerebrospinal fluid analysis, electrodiagnostics, advanced imaging techniques, and both medical and surgical treatment modalities. Instructors are Dr. Mary Smith, Dr. Paul Cuddon, Dr. Richard Park, and Dr. Peter Maguire. Fee: $550/$495 CVMA Member

June 1998

June 4-5, 1998. Medical and Surgical Emergency Course (Small Animal Program)

This course is divided into three sections: emergency medicine, emergency anesthesia, and emergency surgery. Instructors are Dr. Eric Monnet, Dr. James Gaynor, Dr. Tim Hackett, and Dr. Charles Kuntz. Fee: $300/$270 CVMA Member

June 19, 1998. Surgery of the Canine Stifle: Cranial Cruciate Ligament Rupture and Patellar Luxation

This course covers canine stifle diseases. Instructors are Dr. Charles Kuntz and Dr. Erick Egger. Fee: $375/$338 CVMA Member

July 1998

July 8-10, 1998. Canine & Feline Urinary/Endocrine Update

Urinary Program: Overview of the most recent developments in the prevention and treatment of acute renal failure, management of chronic renal failure, and protein-losing nephropathies. The endocrine program will give updates on the latest developments in pathogenesis, diagnosis and treatment of common endocrinopathies. Instructors are Dr. Greg Grauer and Dr. Deborah Greco. Fee: $350/$315 CVMA Member

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

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