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COLLEGE OF AGRICULTURE

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"Give wind and tide a chance to change."

Richard E. Byrd

University of Wyoming

Dear Friends and Colleagues,

As fall approaches, I hope you have all had a productive summer and your seasonal efforts have done well. People are at the core of a land-grant college. Our mission must engage our students, faculty and staff members, administration, legislators, agency officials, citizens, and the scientific and academic communities worldwide.

One way a dean can profoundly affect our engagement as a college is the shaping of our faculty. Despite recent budgetary shortfalls, the college has been fortunate to attract several new faculty members to serve you.

We are fortunate to be adding four new individuals in leadership roles. Professor John Tanaka was hired as the head of the Department of Renewable Resources. He will lead a department that is at the center of some of the most critical



Dean Frank Galey

topics facing the state related to the reclamation and restoration of disturbed lands, range, water quality, and land-use management.

Professor Steve Smutko will join the Department of Agricultural and Applied Economics and will also serve as the Spicer Chair of Environment and Natural Resources at the



(Continued from Page 1)

People are at the core of a land-grant college.
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Haub School and Ruckelshaus Institute of Environment and Natural Resources. Steve has extensive experience and a worldwide reputation in collaborative decision making and community development. He starts in early 2010.

Professor Hermann Schatzl will join the departments of veterinary sciences and molecular biology in the position of the Wyoming Excellence Chair in Prion Biology. Hermann moves here in early 2010 from his home in Germany. His cutting-edge research will focus on diseases such as chronic wasting disease of deer and elk and scrapie of sheep.

Steve Keeley will join the faculty as an associate professor of plant sciences this October. Steve will direct the Sheridan Research and Extension Center east of Sheridan. Steve comes from Kansas State University and has extensive experience working in horticulture and turf grass management.

We are also very pleased to have several assistant professors and a new lecturer joining our faculty. Brian Mealor starts in October as the University of Wyoming Cooperative Extension Service weed specialist. Brian is experienced in using multiple approaches to managing invasive species on the range and will be a welcome addition to our extension staff as well as the faculty of plant sciences.

Urszula Norton joined the plant sciences faculty in August, with responsibility for teaching in our agroecology program. She will also assume responsibility as faculty sponsor for the Agricultural Community Resources for Everyday Sustainability (ACRES) Student Farm on campus.

Kristiana Hansen is an agricultural economist with a background in water economics and policy. Given the importance of water in the state, this position will focus in decisions related to water issues. Kristiana started in August in the agricultural and applied economics department.

Amy McLean joined our animal science faculty as a lecturer in equine science in August. The lack of upper division courses dealing with the horse has been a hole in our animal science curriculum.

Rounding out the group, Kristina Hufford has accepted a position in reclamation ecology in the Department of Renewable Resources and the School of Energy Resources. She will provide needed plant expertise to our internationally recognized program in reclamation and restoration ecology. Kristina starts in spring 2010.

This issue of *Ag News* will highlight a number of activities related to our mission of research, dissemination, and outreach, and it will introduce you to our 2009 Ag Appreciation Weekend honorees. We will recognize two outstanding alums, a very supportive donor to the college, and a productive research partnership.

Thank you for your continued support of your college! Please join us for the Ag Appreciation Barbecue September 26 in anticipation of the football game between the UW Cowboys and the UNLV Rebels. We can be contacted at (307) 766-4133 or by e-mail at agrdean@uwyo.edu. Our Web site is www.uwyo.edu/UWag/.

Dean Frank Galey College of Agriculture



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UW researcher discovers way to trace coal-bed methane water

Little critters in the darkness of coal seams helped lead a College of Agriculture researcher to find a way to trace coal-bed methane (CBM) water and could help energy companies be more efficient and reduce impact footprints.

The research by Shikha Sharma, associate director of the University of Wyoming Stable Isotope Facility in the College of Agriculture, analyzes the ratio of carbon 13 to carbon 12 isotopes to identify CBM water. A patent on the process is pending.

"Carbon works well because, in the coal seams, there are lots of methanogens – bacteria – small critters that feed on the coal substrate and produce methane," says Sharma, a research scientist in the Department of Renewable Resources. The methanogens through their munching leave heavier carbon behind in the coal zones.

"CBM water is highly enriched in carbon 13," notes Sharma.

Sharma uses a carbon isotope ratio of dissolved inorganic carbon to help identify the CBM water. The ratio of carbon 13 to carbon 12 in common water is -11 to -15 per milliliter. "The ratio in CBM water is +12 to +22 - a very significant difference," she says.

Energy companies must pump water from coal seams to allow methane to escape. Water production from individual wells varies, but, on average, wells commonly produce 5 to 20 gallons of water per minute,



Shikha Sharma measures the carbon isotope composition of water using a mass spectrometer in the UW Stable Isotope Facility.

which is about 7,200 to 28,800 gallons of water per day.

If CBM operators aren't drilling in the right seam, they are pumping water from aquifers under or above the seam, says Sharma. "They would be wasting a lot of groundwater and increasing their drilling costs."

A simple test for carbon 13 can determine if a well is being drilled in the right coal seam. "This could help them in optimizing drilling costs and produce methane with a minimum footprint," Sharma says.

Using carbon as a tracer has several benefits over others. Oxygen and hydrogen are greatly affected by evaporation and dilution, and significant contribution of strontium from local rock formations overprints the pristine signatures of CBM water.

In case of carbon isotopes, the difference between two end members – i.e. methanogenic and non-methanogenic water – is very high. Fingerprinting CBM water using carbon isotope is possible even when surface waters are inundated with large amounts of snowmelt.

Sharma tested three groups of water samples in the Powder River Basin. "Our preliminary results show the carbon isotope signatures of the waters can be used to fingerprint contribution of methanogenic waters to groundwaters and surface waters of the region and can therefore help in solving regulatory issues related to discharge of CBM waters," says Sharma.

Results of the study were first published in the March-April 2008 edition of the journal *Ground Water*. It is available at www3.interscience.wiley.com/cgi-bin/ fulltext/119390540/PDFSTART. &

FIRST CUTTING

Soil scientist receives Borlaug award for leadership in agriculture



Eusebius Mukhwana

A soil science doctoral student in the Department of Renewable Resources has received a prestigious Norman Borlaug award for leadership in agriculture.

Eusebius Mukhwana of Kenya was notified of the honor from The Borlaug Leadership Enhancement in Agriculture Program (LEAP). Nobel Laureate Norman E. Borlaug was the driving force behind the establishment of the World Food Prize in 1985. That award is given annually in recognition of outstanding human achievements in the fields of food production and nutrition.

Mukhwana already has a list of accomplishments for his efforts to bolster agricultural efforts in Africa. In 1997, he helped found the Sustainable Agriculture Centre for Research and Development in Africa (SACRED Africa). He was head of the center for 10 years then decided to study at UW.

Mukhwana says arid Wyoming with its high elevations is a test platform similar to conditions in Africa. His research at UW involves working with nine wheat farmers in the Slater and Albin areas of southeastern Wyoming and five sugar beet producers near Powell in the northwest. Mukhwana and his adviser, Assistant Professor Jay Norton, are tracking the long-term effects of producers using a variety of cropping systems and irrigation methods. An article about the research is in the 2009 *Reflections* magazine available from the Wyoming Agricultural Experiment Station in the College of Agriculture. It is available online by going to www.uwyo.edu/UWAG/. Click on *Reflections*.

"It is a prestigious award, a fantastic opportunity to extend his Wyoming research to needs of Kenyan farmers, and a reflection of the caliber of his work with NGOs (non-governmental organizations) in Kenya," says Norton of the Borlaug notification. &

UW research finds

That "ahhh" feeling that comes with feeling warm sunlight on your face after a long Wyoming winter could be more than a feeling – your body could be thanking you for the vitamin D.

Making vitamin D doesn't work like that, of course, but vitamin D supplements or sun in appropriate amounts does do a body good at Wyoming's latitudes. Research of athletes at the University of Wyoming is finding their vitamin D levels fluctuate with the seasons, and the lead researcher says the general public may not be as well off as the athletes.

"We know that people who live at greater than 35 degrees north or south latitude can't make vitamin D in the winter months, which, for us, is probably late October through March," says Enette Larson-Meyer, an assistant professor in the Department of Family and Consumer Sciences. "We need to take supplements or get it from our diet."

Low vitamin D levels affect calcium absorption, which affects bone health and strength. Low levels are linked to an increase in type I and II diabetes, multiple sclerosis, rheumatoid arthritis, hypertension, and many common cancers, according to Larson-Meyer. Low levels in children may cause rickets.

"But, what we are learning is that having low levels impacts inflammation and the immune system," she says. "It's important to have adequate vitamin D levels to fight off what you may come in contact with to make sure your immune system is healthy."

There are a few natural sources of vitamin D – primarily fatty fish, although products like milk and cereal have been fortified



athlete vitamin D levels wobbly; general public probably worse

to meet current required daily standards; however, Larson-Meyer says many experts recommend the level should be increased from 200 international units (IU) to 1,000 minimum IU.

Larson-Meyer, in an earlier study with Louisiana State University of runners in the Baton Rouge area, found more than 41 percent of long-distance runners were vitamin D deficient. The subjects ran at least 25 miles a week.

"You might assume they spent a lot of time outdoors," she says. "But what we decided is that, because it is so hot there, people were likely to run in the early morning."

Larson, with UW athletic trainer Joi Thomas and family and consumer science undergraduate students Tanya Halliday of Stow, Massachusetts, and Nikki Peterson of Riverton, are studying vitamin D levels in UW athletes in football, wrestling, track and field, cheerleading, swimming, men's and women's basketball, and women's soccer.

Blood samples were taken in the fall, just before spring break, and at the end of the spring semester. The end-of-semester results are not yet available, but the other tests showed dramatic drops in vitamin D levels after fall and during winter.

"Over the course of the winter, people living in Wyoming cannot synthesize vitamin D, and their status drastically dropped," says Larson-Meyer. "It's not surprising. Hardly any of the athletes are taking any vitamin D supplements."

About 88 percent had sufficient levels in the fall but only 36 percent in the winter.



Assistant Professor Enette Larson-Meyer conducts a bone density scan of Emily Byra of Laramie, a junior last semester at the University of Wyoming and a cross country runner and member of the women's track team. Larson-Meyer, a faculty member in the Department of Family and Consumer Sciences, uses equipment in a UW Corbett Building laboratory that utilizes dual-energy X-ray absorptiometry, an enhanced form of X-ray technology.

Members of the general public are probably not as well off as the athletes, she says. Some people do not want to take supplements, and some people fearful of skin cancer are careful about how much sun they receive.

Most at-risk to complications from inadequate vitamin D are those hospitalized or homebound. Also, obesity seems to cause lower levels of the vitamin, she says.

Larson-Meyer recommends exposing arms and legs to sunlight for five to 30

minutes between 10 a.m. and 2 p.m. twice weekly without sunscreen, depending upon the season, latitude, and skin pigmentation. Sunscreen with SPF 15 or more should be applied for longer durations of skin exposure.

Or, vitamin D supplements at 1,000 to 2,000 IU daily are a solution. "There is no risk to it, and they are not very expensive," says Larson-Meyer. It may optimize one's immune system and reduce risk of chronic diseases. &

FIRST CUTTING

Horn fly research claims top buzz in College of Agriculture research magazine

Finding ways to defeat the horn fly and what part economics plays in landowners utilizing conservation easements received top awards in the University of Wyoming Agricultural Experiment Station (AES) research magazine *Reflections*.

An anonymous committee of College of Agriculture faculty members selected the recipients. *Reflections* is published through the AES and is designed to showcase the College of Agriculture's teaching, research, and outreach programs. Have you heard the latest buzz?

An article by doctoral entomology student Bryan Stevens about his horn fly research received the top ranking in the 2009 Reflections magazine. Stevens, in front of a poster from elementary students, visits first- and second-grade students each year to teach them about insects.

"Conquering the uncon-

querable horn fly," by Bryan Stevens, an entomology doctoral student in the Department of Renewable Resources, received first place and \$750.

"Can conservation easements help keep the 'rural' in rural communities?," by graduate student Graham McGaffin of Sioux City, Iowa, Assistant Professor Donald McLeod, and Assistant Professor Christopher Bastian, all of the Department of Agricultural and Applied Economics, received second place and a \$500 award. This is the second consecutive year a submission from the department received second place.

Stevens, of Laramie, conducted horn fly research at an eastern Wyoming ranch and designed special traps to capture insects and pupae. His research examined whether pesticides that control grasshoppers might also help control horn flies, which suck blood from cattle.

Researchers in the agricultural and applied economics department conducted focus group interviews with agricultural landowners and land trusts over a two-year period, meeting with more than 100 people to discuss relevant issues and topics before conducting survey research. The outcomes identified a number of issues that were used to develop a survey mailed to nearly 5,000 landowners in Wyoming and Colorado. The results were analyzed to determine what prompts some landowners to implement conservation easements and others to not.

There are 16 research stories in the magazine. *Reflections* is available at UW research and extension centers near Powell, Sheridan and Lingle, at UW Cooperative Extension Service offices, and online at www.uwyo.edu/Agexpstn/Reflections/magazine.htm. Copies can also be obtained via mail by calling the AES office at (307) 766-3667.

WSVL detects

Sudden death of cattle is one of the facts of life – and death – on ranching operations. Often, the cause is straightforward enough: pneumonia, bloat, hardware, accidental poisoning, trauma, lightning strike, or brain infections.

Many veterinarians in the United States, particularly in the feedlot industry, assume cardiac disease caused by the bacterium *Histophilus somni* is a largely Canadian problem, due to hard winters or specific management practices in that country.

Because of this, Department of Veterinary Sciences Professor Donal O'Toole says he was surprised when a Wyoming veterinarian contacted him last year to say he believed this disease was a problem in two cattle feeding operations in the Wheatland area.

"I asked him to send me a case, he did, and it was the classical 'Canadian' disease. We grew the organism from the heart and agreed to do a survey of the problem in 2008 and 2009," O'Toole says. "The veterinarian noticed the disease occurred each year between late October and late January. Some cattle that survived initial infection tended to die after winter storms."



bacterial 'heart attacks' in Wyoming cattle



Professor Donal O'Toole

Travis Allen of Cheyenne, who graduated in May with a bachelor's degree in animal and veterinary sciences, was hired by the Wyoming State Veterinary Laboratory (WSVL) to process 20 hearts from cattle suspected of having died from heart attacks caused by *H. somni* infection.

O'Toole, with the assistance of Allen, now a veterinary medicine student at Washington State University, found *H. somni* in 10 of the hearts. The other 10 were cases of pneumonia, renal infection, presumed trauma, and death to unknown causes.

"The 10 with heart disease were straight out of the textbook – each had discreet changes in papillary muscles of the heart," O'Toole says. "To put this in perspective, in a typical year, the WSVL sees just one or two cases of the disease, so we assumed it was a sporadic problem. Yet, we found five to 10 times that number on two properties where a veterinarian took time to carefully examine hearts."

He adds, "Clinical signs in cattle were that they were found dead or dying, or they were noticed depressed, off feed, and feverish for two to 15 days."

O'Toole says isolates of the *H. somni* collected from the Wyoming cattle were sent to Professor Lynette Corbeil, a veterinary microbiologist at the University of California, San Diego, and she determined the strains were no different from bacteria isolated from other syndromes – including pneumonia, meningitis, and encephalitis – caused by this organism.

O'Toole says interesting questions remain.

Is the disease on these two properties peculiar to them, or are they being recognized because the veterinarian performed thorough post-mortem examinations? "I suspect it is the latter," O'Toole speculates.

He adds, "What would happen to the annual death rate if we vaccinated for *H. somni*, specifically using a vaccine made with bacteria isolated from heart? As far as we know, none of the vaccines to *H. somni* licensed for sale in the United States is derived from cardiac strains, and commercial vaccines for the bacterium are minimally effective."

O'Toole says he is also puzzled about where the organism "hides" in cattle before it arrives in the heart.

"Examination of affected hearts indicates a huge shower of organisms arrives at one time, plugging small vessels and killing heart muscle," he says. "We have yet to identify where the bacteria originate. The lungs are a most obvious source, but changes in the lungs are minimal. In many cattle, we neither see bacteria in lung nor grow them from this tissue."

O'Toole adds, "We hope to learn more about the bacterium and how it affects cattle to help with prevention. Maybe we will interest a promising young graduate to do his or her Ph.D. on this and get an effective preventative for the disease."

Producers concerned about the disease should contact their veterinarians, and if they suspect *H. somni* infection in their cattle, they are urged to contact O'Toole at (307) 742-6638 or dot@uwyo.edu. &



Cardiac disease in cattle caused by the bacterium Histophilus somni tends to occur in a specific part of the heart, which makes diagnosis more difficult.

FIRST CUTTING

First dirt tossed for specialized \$25 million laboratory

Critical research and testing on diseases that infect both domestic and wildlife herds in Wyoming will be housed in the new \$24.9 million biosafety level 3 (BSL-3) laboratory when complete in about two years.

Groundbreaking for the addition to the Wyoming State Veterinary Laboratory (WSVL) was June 23 in West Laramie. A BSL-3 laboratory allows disease agents like brucellosis, plague, tularemia, and Q fever to be studied in a safe environment.

"When complete, the BSL-3 laboratory will significantly increase our ability to diagnose and then do needed research about these disease agents," says Frank Galey, dean of the College of Agriculture.

Jim Magagna, executive vice president of the Wyoming Stock Growers Association, says his organization is pleased the project is starting because of the ongoing challenge with brucellosis in northwest Wyoming.

"We have worked very hard the last two or three years with the University of Wyoming and Wyoming State Legislature to secure funding for this," he notes.

The cost of construction is projected at \$18 million and the total project cost \$24.9 million, says Ian Catellier, project manager for the State of Wyoming. Funds will come out of the Wyoming General Fund. The legislature approved the project during its session earlier this year.

A federal BSL-3 designation for a laboratory means it's designed to be highly secure. With specialized safety features, the lab provides a safe environment for researchers whose work involves biological agents that may cause disease in humans and animals.

"This is a perfect example of how the research and outreach missions of the university work to help solve issues impacting



Throwing the ceremonial first shovels of dirt are, from left, Don Montgomery, director, Wyoming State Veterinary Laboratory; Dean Frank Galey, College of Agriculture; Rich Cathcart, General Services Division administrator, State of Wyoming; Charlie Graft, CEO, GH Phipps Construction Companies; Gov. Dave Freudenthal; UW President Tom Buchanan; Chuck Brown, president, UW Board of Trustees; State Sen. Mike Massie, Albany County; Jerry Jeter, HDR architecture; and State Rep. Dan Zwonitzer, Laramie County.

Wyoming," UW President Tom Buchanan said at the groundbreaking. "The work that will be done in the new biosafety lab is applied research at its best."

Since the Department of Homeland Security was established following the Sept. 11 terrorist attacks, research with live *Brucella abortus* bacteria can be conducted only in a BSL-3 laboratory.

"We believe the only long-term answer to brucellosis in Wyoming wildlife and spreading to cattle is through research over time bringing us a more efficacious vaccine," says Magagna. "We are anxious to see research undertaken."

The Wyoming Wool Growers Association has been a longtime supporter of the WSVL, which is managed by the College of Agriculture, says Bryce Reece, executive vice president of the organization.

"We saw early on what the capabilities of an enhanced BSL-3 laboratory could do for our industry and our state and have supported it throughout the long and sometimes arduous track it has been forced to travel," he says.

The BSL-3 laboratory will improve the capabilities of the WSVL, Reece says, "which, in turn, enhances and provides tremendous benefit to both the sheep industry of Wyoming as well as all of animal agriculture in Wyoming."

Reece, who is a strong proponent of the WSVL, says the BSL-3 laboratory will underscore WSVL's status as one of the premier facilities in the region.

"We live in a changing, complex, and much more dangerous world than at any time in our nation's history," says Reece. "Protection of our agriculture base is not only of importance to the producers who make their living in agriculture but is also one of our country's most important national security challenges." &



Brucellosis vaccine, diagnostics research progressing

By Rachel Knutson University of Wyoming journalism graduate

Gerry Andrews is not wearing the starched white laboratory coat you might expect. Nor is he partaking in his typical daily routine, weaving from one station to the next, pipette in hand.

No, today Andrews leans back in his desk chair, comfortable in a pair of jeans and button-down shirt, with his hands crossed over a knee. Despite the absence of the lab coat and test tube, Andrews exudes the level-headed, analytic patience of a scientist as he discusses the time-intensive process of his team's research.

"You have to do it systematically. We have enough data I feel comfortable moving forward, but we have a long way to go," says Andrews, rocking forward in his chair. "Animal work takes a lot of time, you know."



Assistant Professor Gerry Andrews

Andrews knows very well. He has been researching elk brucellosis vaccines and diagnostics since 2005. Andrews, an assistant professor in the Department of Veterinary Sciences, and his team hope their research will eventually lead to better diagnostic methods and possibly a new, more effective vaccine for brucellosis in elk, cattle, and other animals.

The team is testing potential brucellosis vaccine candidates in laboratory rodents because mice are the most economic and easiest-to-use mammalian laboratory model.

"Brucellosis can be mimicked in the mouse, so it's a good 'surrogate' model for the same disease in ungulates. You have to start somewhere with animal models; in this case, it's not going to be any bigger than a rodent," Andrews says.

Recently, brucellosis has been a prominent problem for Wyoming and its livestock industry. In 2004, when two herds of cattle were infected with *Brucella abortus* in west-



Assistant Professor Gerry Andrews shares information with research technician Jessie Spellman, who graduated from the University of Wyoming in May, while working in his laboratory in the sixth floor of the College of Agriculture.

ern Wyoming, most likely due to contact with nearby feed-ground elk, the state lost its brucellosis-free status for two years. *B. abortus* is the species of bacterium that can cause elk, bison, and domestic cattle to abort.

To help combat the problem, the Wyoming Governor's Brucellosis Coordination Team, which College of Agriculture Dean Frank Galey chairs, was formed in 2005.

"The team studied issues related to brucellosis in wildlife and livestock extensively and then made 28 recommendations to the governor and legislature about ways to begin to manage and later work to reduce the incidence of the disease," Galey says.

The Wyoming Game and Fish Department (WGFD) stepped up to help by conducting several brucellosis-related research projects. One WGFD project is test and slaughter, in which Department of Veterinary Sciences Associate Professor Todd Cornish and Laura Meadows, of Wilson, who is scheduled to complete her master's degree in animal and veterinary sciences (ANVS) this fall, have been extensively involved. For more on test and slaughter, see the story in spring *Ag News*, "Researchers seek to unravel elk brucellosis mystery," at www.uwyo.edu/uwexpstn/AGNEWS/ AGNEWS main.htm.

Hank Edwards, a wildlife disease specialist in the WGFD's Wildlife Disease Laboratory housed in the College of Agriculture's Wyoming State Veterinary Laboratory (WSVL), is also collaborating. He says a new diagnostics method or vaccine could help those researching brucellosis, like himself and the Cornish team, and it could ultimately help ranchers, wildlife managers, and others control the disease.

This is where Andrews and his team come in.

When he began working on the project in 2005, Andrews was aware of the need for better diagnostics methods and a better brucellosis vaccine. "Depending on the success of the research, developing a better method of diagnostics should help wildlife managers streamline brucellosis process management. A new effective vaccine would also most certainly contribute," Andrews says.

In addition, the new diagnostic tool or vaccine would provide a sense of psychological security to ranchers, Andrews believes. "The rancher won't be worried when he or she sees elk mingling with livestock if the cattle are immune and the elk are as well," he speculates.

Much of the current brucellosis research in the country is focused on cattle, says Frank Roberto, a directorate fellow in the Biological Systems Department of Idaho National Laboratory, because there are "simply a lot of politics involved with vaccinating wildlife." These include the question of whether vaccinating a wild animal, like elk, would be necessary if domesticated cattle are already adequately vaccinated. There are also questions of how to administer a vaccine to wild animals and how to keep track of which animals have been vaccinated, Roberto adds.

Andrews believes his research could be useful for diagnostics and vaccines in both cattle and wildlife. Furthermore, he says, if disease eradication is the ultimate goal, then the most aggressive approach – vaccinating both cattle and wildlife – would probably be the best option.

While Andrews, the blue jean optimist, considers this ultimate goal a possibility, Andrews, the test tube scientist, knows the research team still has a long road to travel.

Before they could consider developing better diagnostics or a new vaccine, Andrews and his team first had to understand the bacterial virulence genes involved in the disease. Using a gene discovery approach called In vivo-induced antigen technology (IVIAT), they identified a set of genes that is up-regulated, or turned on, by the *Brucella* bacterium when it is inside the host, says Jake Lowry, who graduated in 2008 from the University of Wyoming with a master's degree in ANVS. Lowry worked extensively for two years with IVIAT gene identification during his time in the Andrews laboratory.

Lowry, originally of Hubbard, Ohio, is in his second year of veterinary medicine school at Colorado State University (CSU) in Fort Collins, but he is still helping with the brucellosis research when his schedule allows. He is also training Jack Leonhardt to carry on with the research. Leonhardt, who was raised on a ranch near Cowley in Wyoming's Big Horn Basin, worked under Andrews and Lowry while finishing his bachelor's degree in microbiology last spring, and he is continuing his studies in the lab as a master's student.

"I enjoy applying the technology I learned about in classes, and I have found that working with brucellosis in the laboratory relates back to my ranch work," Leonhardt says. "I did not think going into microbiology would tie into ranching, but it's kind of ironic I am still indirectly working with cattle."

Using the IVIAT method, Andrews, Lowry, and colleagues have been successful in selectively identifying bacterial genes relative to brucellosis infection. The process is not a simple one, nor is it quick. In 18 months, Lowry spent hundreds of hours in a lab screening more than 35,000 gene fragments and proteins and, to date, has found just 10 the team believed to be relevant to its goals.

Andrews says the two major goals are to evaluate the proteins for their potential use as diagnostic targets and for the possibility of their use in a vaccine. Among those assisting is Jessie Spellman, a research technician who graduated from UW in May with a double major in microbiology and Spanish. "I'm still learning a lot of the techniques, but it's been fun to apply what I've learned with my microbiology education," says Spellman, of Cheyenne.

Last year, Andrews' team began evaluating the effectiveness of three of the 10 proteins they identified using IVIAT as vaccine candidates in laboratory mice infected with *B. abortus* Strain 19 (this strain has been used for elk, but it is not very effective).

One particular protein, which Andrews fondly refers to as "our favorite," showed significantly more rapid clearance of *B. abortus* Strain 19 and significantly reduced bacterial load in the rodents injected with the protein than those that were not. Andrews says the next step is to try combinations of the different proteins as well as characterize how animals respond to them immunologically. The latter effort is primarily being done by Amanda Fluegel of Dakota, Illinois, an ANVS doctoral student in the Andrews lab.

These proteins, Andrews says, may also be used as predictors of brucellosis in diagnostics work. In essence, by simply dripping an animal's blood onto a new diagnostic device, researchers would be able to use the proteins in the blood to identify a brucellosis-positive or vaccination-positive animal. Lowry explains further, "It is the same technology as a pregnancy test, except we would use blood instead of urine; for example, two or more lines would show up for positive and only one if negative."

So why aren't researchers and wildlife managers using this diagnostic tool or trying new vaccines on elk?

Time, of course, is one factor. Besides the detailed, intensive research necessary to develop a vaccine, Edwards says, "Even if you had the vaccine in your hand right



Hank Edwards, a wildlife disease specialist with the Wyoming Game and Fish Department (WGFD), is collaborating with other WGFD and College of Agriculture scientists on brucellosis research.

now we'd still be several years out. It takes a long time to get studies done on safety, and there are a lot of gates to pass through."

Andrews also cites other factors affecting the pace of the research.

UW currently has only a biosafety level 2 (BSL-2) lab, which is designed to maximize safe conditions for researchers working with agents of moderate risk to personnel and the environment. A BSL-3 lab with animal capabilities is required for the next step in the research, which involves infecting vaccinated rodents with wild-type strains rather than *B. abortus* Strain 19. Working with wild-type brucellosis requires a BSL-3 lab suitable for work with infectious agents that may cause serious or potentially lethal diseases as a result of exposure.

Groundbreaking for the new \$25 million BSL-3 lab took place in June, and the project should be complete within two years. So, for now, Andrews and his team will travel to CSU, which has an animal BSL-3 lab, for the next step in their research. These studies are in collaboration with Richard Bowen, a professor in CSU's Department of Biomedical Sciences.

Andrews says there is very little of this type of genetic-discovery-based brucellosis research happening elsewhere in the country. Instead, according to Roberto, research is concentrated on improving RB51, the

A story initially describing the brucellosis research of Andrews and his team appeared in the winter 2006 edition of Ag News. Please see Page 4 at www.uwyo.edu/AgCollege/ AGNEWS/winter06.pdf.



Jessie Spellman is trying to characterize two proteins as potential diagnostic targets relating to brucellosis in elk, cattle, and other animals.

current vaccine used for cattle that is only about 70 percent effective. Andrews and his team are not working to improve the current vaccine but are rather trying to develop an entirely new one.

"I would say the ultimate goal would be to develop a new vaccine to replace RB51. If we could replace it with a more effective vaccine, our brucellosis cattle problem in Wyoming could disappear," says Lowry, who also cites the development of a better diagnostics method as a primary goal.

Lowry says it's important the research progresses because solving the brucellosis problem would prevent economic losses to ranchers, who, as a whole, spend millions of dollars per year to vaccinate their cattle with a vaccine that is not entirely effective.

Despite hold ups, such as the time required of this type of research, the bureaucratic gates involved in obtaining approval for a new vaccine or diagnostics assay (substance undergoing trial), the lack of a BSL-3 research facility in Laramie, and the limited number of similar research studies with which to compare the work, the team continues to plow forward.

"You know, it's baby steps," Edwards says. "We're a little closer, but we're certainly not there. I mean, the country has been working for 70-plus years on brucellosis, and there is still not a test to identify culturepositive animals. It's a really tough disease to crack; the more we find out, the more and more complex brucellosis becomes."

Adds Andrews, leaning back in his chair, "It's going to take time and patience." 🖗

Editor's note: Rachel Knutson, of Pierre, South Dakota, graduated from the University of Wyoming in May with a bachelor's degree in journalism. She traveled to Singapore in August where she will spend the next 16 months teaching English and media content classes to junior and senior high students through a collaborative program between Princeton University and Singapore's Ministry of Education.

OH YEAH? SO WHAT? PROVE IT!

Small-acreage team puts reps on the line in property makeover projects

By Steven L. Miller, Senior Editor Office of Communications and Technology

yoming resource experts will have to practice what they preach when applying their expertise to rehabbing two selected small-acreage properties near Wheatland and Casper.

The public can watch the property makeover process – success and/or failures – through magazine articles, podcasts, and through Web pages.

The rehabilitation effort is a little like the ABC television show "Extreme Makeover" – but at ground level and the progress much slower-paced.

"The purpose is to not only provide nitty-gritty information for people to put to use on their properties but to also provide inspiration that in fact it can be done," says Jennifer Thompson, coordinator of the Small Acreage Outreach Project.

The small-acreage project, began in 2004, includes publication of the quarterly magazine *Barnyards & Backyards*, small-acreage workshops across Wyoming, information tools, a Web site (www.barnyardsandbackyards. com), e-mail listserv, and creation of a variety of informational sources for small-acreage landowners. Members are from local, county, state, and federal land and water resource organizations. The small-acreage project is spearheaded by the University of Wyoming Cooperative Extension Service (UW CES). The rehab project means attending the University of Wyoming in a very different way, says Tom Heald, UW CES educator in Casper.

"Most folks look at UW as a classroom experience – this is taking the university to the location," he says. "This is a hands-on approach by the university, conservation districts, and weed and pest districts to work with landowners to achieve their goals and along the way pass along that knowledge to others in similar circumstances."

Two resource teams will provide advice to rehab the two properties. "The properties were chosen because they have different ecological sites, the landforms, the part of state they are in, water availability, and diversity of plant communities," says Thompson.

Once formed, teams will learn of the landowners' goals then help develop and implement procedures.

For one group, meeting with the landowner won't be difficult. The property near Wheatland was nominated to the group by UW CES educator Dallas Mount. The 78-acre parcel was contiguous to his two-acre home site about two miles from Wheatland, and he had watched over the years as continuous grazing left bare spots and desirable grasses disappear. Two weeks after Mount nominated the property to the small-acre group, the owners put it on the market, and Mount bought it.



Dallas Mount says Russian olive trees were mechanically removed leaving stumps. Each one resprouted and had to be treated.



Dallas Mount would like to see more of this beneficial Garrison creeping meadow foxtail grass.

In the middle of the Wheatland Irrigation District, the property is in the drainage between two lakes. Russian olive stumps scar one area of the land in a slough. The trees were snipped off two years ago and every one resprouted. The sprouts were treated last year. The previous owners brought their livestock after calving to the pasture and left them the entire grazing season.

"They had 40 head the entire summer and fall and were taken home in October," says Mount. "It had been continuously grazed for multiple years."

Some areas are bare, other areas are overgrazed, and some areas are undergrazed. Weeds invaded bare spots. "There is plenty of grass there with pretty good diversity," says Mount. "My goal is to get the bare spots filled in. Everything else is secondary. We will never get rid of all the weeds, but, if we manage the weeds and see the trend for them going down and the desirables going up, we are heading in the right direction."

Because the area is subirrigated, results will come quicker than on dry land, says Rex Lockman, wildlife and range specialist with the Laramie County Conservation District and chairman of the small-acreage issue team. "Results could be seen in three years rather than 10."

The 20-acre property northeast of Casper is on an ancient sand dune and in a high-wind area.

"It's a very fragile site but is covered with needle-and-thread grass," says Heald, who nominated the property. The property is owned by Tim and Krista Brown, who moved from Atlanta, Georgia, to Wyoming to raise their children in what they see as a safer environment, he says. "Today, they own their slice of heaven," says Heald, "but they don't have a good sense of the environmental factors. They want to be good stewards of the land, and this is so different from Georgia."

The Browns have two horses but no fencing on their property. "The only thing fenced is the corral for their horses," says Heald. "They will have to be careful when they do graze. In Georgia, 20 acres could more than support two horses for a year. But here, the 20 acres might support 20 days of grazing for an entire year." Heald says the area had been overgrazed, native grasses were grubbed out, and cheatgrass has moved in. "An objective would be to get rid of the cheatgrass and promote the native grasses already there," he says.

The high winds always have to be taken into account, especially with the sandy soil. Once vegetation is lost, blowouts could form and take years to fix. The area's water is also high in salts.

"When you look at the state of Wyoming, lots of folks are developing their rural properties," says Heald. "We sometimes call them rugged sites, but we all know they are very fragile. This isn't just Casper – this could be outside Riverton, Cody, or Rock Springs – all beautiful locations, but what we need to do is maintain the sustainability of these locations."

With the Browns, the project objective is to make the property sustainable. "They don't have the tools in the tool bag yet," says Heald. "That's our mission: to help them have a quality of life that is sustainable on this fragile piece of property." &



Cattle never reached some areas, and this intermediate wheatgrass grew tall and became unpalatable.

Researchers identify gene mutation responsible for fatal disease in Red Angus

By Robert Waggener, Editor Office of Communications and Technology

Researchers in the Department of Veterinary Sciences, in collaboration with others, have identified a gene mutation responsible for a fatal bone disease in Red Angus cattle. The team also developed a commercially available diagnostic test for identifying carriers of the defect.

The mutation causes osteopetrosis (OS), which is commonly referred to as marble bone disease because the bones of affected calves shatter easily, like marble.

Calves are typically born 10 to 30 days premature and dead, and the few calves born alive generally die within 24 hours.

One of the researchers, Shannon Swist, an assistant professor in the Department of Veterinary Sciences and a pathologist/ veterinarian at the Wyoming State Veterinary Laboratory (WSVL), says OS occurs in multiple species of animals, including humans, dogs, cats, horses, cattle, sheep, deer, rabbits, mice, and rats.

It may result from acquired causes, such as infection with bovine viral diarrhea virus and canine distemper virus, Swist says, or it may be caused by an inherited defect, as is the case with OS in Red Angus.

"In cattle, osteopetrosis occurs in Black and Red Angus in North America, Hereford, Simmental, Aberdeen-Angus, Holstein, and other breeds," she says. "Osteopetrosis in Red Angus is due to a lethal genetic defect caused by a recessive mutation in a gene involved with bone remodeling during development."





Assistant Professor Shannon Swist

Also involved in the research from the Department of Veterinary Sciences are Professor Donal O'Toole and the WSVL's chief virology technician, Jackie Cavender.

O'Toole says the disorder causes an overabundance of bone to form. When this occurs in the skull of Red Angus calves, it compresses the brain and results in death in late gestation. It also affects the cavities of long bones such as the femur, and these bones are easily fractured.

"We first started seeing cases last year. The main focus now is encouraging producers to test all registered Red Angus for the disease and encouraging them to sell semen only from bulls that are OS-free," O'Toole says. "We worked closely with one producer in Wyoming to submit calves suspected of having the disease. Once the pathologist confirmed the diagnosis based on necropsy findings, DNA samples were taken and sent Larry Keenan

to a genetics lab. The molecular geneticists needed DNA from proven positive calves to find the defective gene."

O'Toole emphasizes, "The Red Angus Association of America (RAAA) has done an exemplary job in being open about the defect and doing what needs to be done so a test was developed for carriers. As long as producers test for the disease, carriers will be detected and quickly eliminated from the breeding population."

Larry Keenan, director of breed improvement for the Denton, Texas-based RAAA, said in mid-July approximately 1,750 Red Angus bulls, cows, and calves had been tested nationally for OS, and 350 were positive.

"We're expecting in the next several months that the number of tested animals will greatly increase; this is because a wider availability of testing due to new labs being approved," Keenan says. "It's still a little



Department of Veterinary Sciences Assistant Professor Shannon Swist and colleagues at the Wyoming State Veterinary Laboratory were heavily involved in a research project with other institutions to identify a gene mutation responsible for a fatal bone disease in Red Angus cattle. Here, she examines a sick calf and takes a blood sample.

premature to determine the effect of this on our association, but as far as the cattle being sold, we're not seeing a significant hit on the purchase price of carriers."

Some producers are sending OSpositive animals to slaughter (there are no known risks consuming their meat), Keenan says, while others are continuing to breed these animals but are testing all of the offspring to determine whether the genetic disorder was passed on.

The RAAA has about 2,300 members, including 54 in Wyoming, with a total active cow herd of approximately 87,000 breeding animals, so the number of OSpositive animals represents a small fraction of the total number of registered Red Angus, he says.

Keenan, though, stresses the RAAA is taking the disease seriously and is doing everything it can to help producers curb the problem.

"We have spent considerable resources educating our producers in how to identify affected calves. They will always have a short lower jaw. That's the only thing that looks abnormal," he says. "This means some producers may not have investigated a death assuming it was natural causes or a late-term abortion."

The RAAA Web page (http://redangus. org/) contains much information about OS, including details about new diagnostic tests being offered by Pfizer Animal Genetics, the RAAA's genetic defect policy, a questionand-answer section, a herd genetic defect status report, and a listing of approved DNA testing facilities.

Keenan adds, "I have spent considerable time talking with Dr. Swist and Dr. O'Toole. They were excellent to work with, and they offered a great deal of help and expertise."

Swist says, "Testing of Red Angus is underway, resulting in publicly available lists of carrier and tested-free animals posted with the cooperation of the RAAA on its Web site. Testing for carriers of the OS defect is essential to avoid the negative impact this disease has on the calf crop and preventing proliferation of the recessive gene in the Red Angus population."

In addition to the Department of Veterinary Sciences team, others involved in identifying the gene mutation responsible for OS and developing a diagnostic test were from the University of Illinois at Urbana-Champaign (UI), University of Nebraska-Lincoln (UN), University of Maryland, U.S. Department of Agriculture's (USDA) Roman L. Hruska U.S. Meat Animal Research Center (USMARC) in Nebraska, USDA's Henry Agaard Wallace Beltsville Agricultural Research Center in Maryland, and the RAAA.

DNA testing was overseen by Jon Beever, an associate professor at UI, and Timothy Smith, a research chemist at USMARC. David Steffen, a pathologist at UN's Veterinary Diagnostic Center, is the Red Angus genetic defect consultant who worked with Swist, O'Toole, and others on diagnostic work.

Swist and her colleagues will present information about the nature of the malformation and the genetic defect at the 60th annual meeting of the American College of Veterinary Pathologists this December in Monterey, California. &



Jackie Cavender, chief virology technician at the Wyoming State Veterinary Laboratory, was involved in the Red Angus research.

AG APPRECIATION



WEEKEND Schedule of Events

The College of Agriculture's outstanding alumni, research partner, and legacy winners for 2009 will be honored September 25-26 as part of Ag Appreciation Weekend, a celebration of the importance of agriculture to Wyoming's history, culture, and economy.

Ag Appreciation Weekend events include:

September 25

Dean's Ag Appreciation Dinner honoring College of Agriculture graduates Keith Geis and Steve Tharp, Legacy Award recipient Leroy Maki, and Y-TEX Corporation, the Research Partner of the Year. Those wishing to attend may make reservations by contacting the College of Agriculture's Dean's Office at (307) 766-3372.

September 26

- 27th annual Ag Appreciation Day Barbecue, 11-12:30 p.m. at Tailgate Park.
- UW vs. UNLV football game, 1 p.m.

Tickets for the barbecue can be purchased at the event or before Friday, September 18, from the College of Agriculture's Office of Academic and Student Programs at (307) 766-4034. Food for the barbecue is provided by Wyoming producers with College of Agriculture student organizations preparing and serving the meal. Proceeds provide scholarships for College of Agriculture students and help fund various agriculture college student organizations.

The College of Agriculture has reserved Ag Appreciation Weekend group football tickets for Saturday, September 26. The tickets are in section G – adults \$18, children \$8. Go to https://www. groupticketwindow.com/groupticket/college/cowboys/group. In capital letters, type AGDAY in the Sign-In ID box, and type POKES in the Password box. Then follow the directions on how to purchase a ticket or tickets. \clubsuit

AG APPRECIATION Veterinarian Steve Tharp the James Herriot

By Robert Waggener, Editor Office of Communications and Technology

Worland veterinarian/author Steve Tharp carries on the legacy of veterinarian/author James Herriot but with pronounced Wyoming flavor, say those who nominated him for a College of Agriculture outstanding alumnus award.

Tharp might not have a pen name, but he has a collection of writings, the reputation of an outstanding veterinarian, good humor, and admirable character – just like the late James Alfred Wight, who practiced veterinary medicine in England and became widely known for his semi-autobiographical short stories under the pen name James Herriot.

"Many times while visiting Steve's clinic, I am reminded of the James Herriot series of books beginning with *The Lord God Made Them All*," stated Worland resident and former state legislator Jane Wostenberg in her nomination letter. "Steve could easily have been the main character in these stories, and I often think of him as the James Herriot of the Big Horn Basin."

Department of Veterinary Sciences Professor Donal O'Toole added, "Steve is something of a Wyoming character. He enlivens veterinary meetings with his wisdom, humor, and common sense. He is an important part of his community, and he plays this part with good humor, generosity, civility, and grace."

When one meets Tharp for the first time, it doesn't take long for the humor to spill out. During this particular conversation, he opens: "Yes, I guess you can call me a 'character,' but I think I have picked that up because I believe we all take ourselves too seriously. I typed in the word 'Woodstock' on YouTube the other day, and here I'm watching these guys on stage really take themselves seriously. They were going to change the world. They believed it; they meant it. They took their music and their social agenda seriously."

Tharp adds, "I wonder how many of them look back and say, 'It was a great idea, but in the end the agenda was bigger than the people behind it?' They now probably get a laugh out of how they dressed and acted."

At the time of Woodstock, Tharp was entering his senior year at the then Manderson-Hyattville High School northeast of Worland. He and his four siblings worked hard on the family ranch, milking cows, tending sheep and hogs, and harvesting crops. That's when he started thinking about becoming a veterinarian.

Tharp enrolled at the University of Wyoming in 1970 and initially took classes seriously. But then he started enjoying the good times.

"I became one of those rabble-rousers on the first floor of Crane Hall. I partied quite a bit," Tharp vividly remembers of his second semester. "Then my dad had a pretty serious talk with me!"

The talk made a difference, says Tharp, who adds, "I connected with something after that, and then I began to perform to my abilities."

Tharp majored in microbiology in the College of Agriculture, and he says it was

people like his adviser, Professor E. Lee Belden, who had a major impact on his life. "Dr. Belden did a lot in giving me direction. Oftentimes, it's less about what people say and more about what they do. You watch them in motion and say, 'I wouldn't mind being like him or her.' Those mentor figures do impact us."

Tharp graduated in 1976 with a bachelor's degree in microbiology, figuring the field would open many doors if veterinary medicine wasn't in his cards. "I thought microbiology was like a Baptist baptism – total immersion," he says.

He earned his doctor of veterinary medicine degree from Colorado State University in 1978. He headed straight back to the Big Horn Basin and started working under Worland DVM David Asay.

O'Toole says, "The College of Agriculture produces its fair share of pre-veterinary students who go on to professional school at CSU and beyond. But only a fraction come back to Wyoming since rural practice in small towns is not for everyone. Steve carries on the legacy of James Herriot but with a pronounced Wyoming flavor."

Tharp opened his own clinic in Worland two years later, and he continues to treat both small and large animals, from cats and dogs to cows and horses.

"In times gone by, that was common, but not in today's world," Tharp says. "You have to have a different level of awareness for each and every species."

Tharp describes running a veterinary practice as "endless hours of routine interrupted by brief moments of stark terror.

WEEKEND of Wyoming

It's like triage – emergency medicine after a quiet day of vaccinating dogs and cats. You learn to wear a lot of different hats."

Tharp says an outstanding staff has made his work easier, and among the employees is wife Bobbie. "She's the office manager, comptroller, accountant, spiritual director, counselor, and parent, and, on the side, she farms. If Bobbie didn't hold me in check, I would probably be some kind of New Age hippie."

Tharp says his career has been rewarding. "It's not what you get from it but who you become through it. I've become more introspective and have been able to not take myself too seriously. I try to put things in perspective and have learned you can stretch yourself a lot further than you thought."

Worland residents Kerry and Glo Clark stated in their nomination letter, "Steve is an astute businessman running an efficient and caring veterinary clinic serving ranchers and pet lovers alike. He is a great employer, challenging his employees to personal growth. And he has mentored many a young, aspiring veterinarian."

One of them is Douglas veterinarian Kenzie Mares, who grew up in Worland, interned for Tharp during high school, and then worked at his veterinary clinic for four years. "He inspired me to become a veterinarian by setting a stellar example, and he also encouraged me to go to UW," she wrote in her letter. "He kindles the flame of the human spirit and evokes positive activity in those around him."

Worland veterinarian Dan Miller notes, "Dr. Tharp is my across-town com-



Steve Tharp with Dotty, one of two bucket calves at his practice.

petitor, yet he is always there for me in terms of professional help and assistance."

Lee Ann Baker, executive director of the Washakie Development Association in Worland, says Tharp is an active community volunteer and a great ambassador of UW.

"Dr. Tharp is a colorful professional in our area who can be counted on to perform a C-section on a heifer, clean up, and get to a charity event to be the MC or auctioneer, all on a Saturday night," Baker wrote. "That is, of course, if he is not in Laramie at a Cowboy game."

Tharp participates in the UW Cowboy Joe Club's Steer-A-Year program, is the representative of Washakie County on the UW Alumni Association board, and calls himself an avid Cowboy and Cowgirl fan. He's an officer at-large with the Wyoming Veterinary Medical Association and a member of the American Veterinary Medical Association.

Closer to home, Tharp volunteers with 4-H, FFA, Worland-Ten Sleep Chamber of Commerce, and Special Olympics. He is on the board of Washakie County Public Health, participates in school reading programs, and was this year's speaker at the Worland High School graduation.

"In life, you'll come to a crossroad," Tharp remembers telling the graduates. "If you can find a purpose or a passion in your life, you'll be able to fly. There will be no end to what you can accomplish."

The Tharps have two children – Mandy works at the senior center in Worland, and Talon is a master's candidate in counseling at UW.

Tharp says he hasn't gotten into the "political foray" yet, but, if he ever does, he will bring one important quality with him.

"I'd like to say that life has taught me to be a person of integrity," he says. "I've learned that your word is your bond, that if you say it, you gotta mean it and you gotta do it."

And talking of words, some of the nominators say life has taught Tharp to be a pretty good poet. To see his writings, go to http://tharpveterinaryclinic.com.

"You have to temper life with humor, and this is reflected in the stories," Tharp says. "Otherwise, you just take yourself too seriously." &

AG APPRECIATION Alumnus award winner heeded Wyoming's

By Steven L. Miller, Senior Editor Office of Communications and Technology

Laramie Peak hasn't changed locales from where it has for millennia dominated the skyline and watched the business of life in southeast Wyoming.

Not so the guy in the corner office – the president's office – of Platte Valley Bank not far off Interstate 25 in Wheatland. Laramie Peak saw Keith Geis uprooted to Laramie as a high school junior from the dairy he grew up on southwest of town and then sidetracked to Alabama and Iowa before returning to the mountain's landscape.

Crisscrossing the country, raising a family, and returning to his hometown haven't seemed to alter the ideals Geis was taught when young.

"I'm an advocate of being the very best you should be and giving back to the world around you," says Geis about what he would say to University of Wyoming freshmen. "Pay your dues forward. Do something for someone else, and don't expect anything in return. If you do, you will be successful no matter what you do."

A cowboy creed hangs on his office wall. Spurs rest in a cubby hole not far from his desk.

"Anyone who knows Keith knows he loves Wyoming and the University of Wyoming," writes Billie Addleman of the Hirst Applegate law firm in Cheyenne. "He wears that passion on his sleeve, and I cannot think of a better ambassador of our state and university than Keith Geis."



Here are only a few contributions Keith Geis has made to the state and agriculture:

- Past president of the Wyoming Agriculture in the Classroom and board member for 10 years.
- Member of the government relations committee and member of the Wyoming Bankers Association Board of Directors.
- Past president and board member of the Wheatland Area Development Corporation.
- 2006 Community Builder Award from Platte County Chamber of Commerce.
- Current member and chairman of the Platte County Memorial Hospital Advisory Board and the Platte County Hospital Foundation Board.
- Member of the American Bankers Association, Agricultural and Rural Bankers Committee.
- Past chairman and board member of the UW College of Agriculture Advisory Board. There are many, many more.



Keith Geis grew up on a dairy farm near Wheatland and crisscrossed the country during his financial career before returning to his hometown.

Dennis Sun, publisher of the *Wyoming Livestock Roundup* in Casper, has served with Geis on several nonprofit organizations. "The values and passion he has in helping others is unequaled in Wyoming," notes Sun.

Not bad for someone who had worked as a laborer at the UW Stock Farm and huddled with his wife, Marie, in the bachelor's huts while attending UW. His parents, Zane and Gladys, and the rest of the family moved to Laramie in 1969 when his father went to work for the university's micro veterinary laboratory.

A graduate of Laramie High School, he attended Graceland University in Lamoni, Iowa. He married Marie when a sophomore and moved back to Laramie. "My wife is from Mobile, Alabama, and she can share some interesting stories," says Geis. "She had never experienced winters like Laramie

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allure to return

can periodically provide." He earned his bachelor's in agriculture economics from UW in 1975.

Why economics? "It was intriguing to me in finding ways one might increase efficiency or be better at allocating resources to increase profitability to the bottom line," he says. He interned with the then-Farmers Home Administration (FmHA) in Basin and worked in Torrington after graduation. He then took a political appointment with FmHA in Geneva, Alabama. After a year and a half, his wife encouraged their family to move back to Wyoming.

"Even though she was from Mobile, she did not realize a place existed in rural Alabama like Geneva," he relates. "It was evident after administrations changed I was a Yankee. I was told I would move to Winston County, Alabama."

Winston County is known for its independent thinking. Deep in the South, it gained notoriety for its opposition to secession during the Civil War, which was so strong it was sometimes referred to as the Republic of Winston.

Geis never went to Winston County; he went to work for the Federal Land Bank in DeWitt, Iowa, then for Farm Credit Services in 1982. He was vice president of marketing. The organization began consolidating offices in 2002, but Geis had been through that process in the 1980s. "It had left a void in customer services," he says.

Then came a phone call from Platte Valley Bank while he was driving one day. Would he be interested in moving to Wheatland and manage a bank?

Geis: Great core values, integrity of its people make Wyoming great place

Crisscrossing the country in various lending positions, this is Wyoming native Keith Geis' third time back in the state.

He's a standout Cowboy State proponent. "When you drill down and get to business, Wyoming is a challenging place to live," Geis says. "Wyoming is passionate about what it offers, and I think the 'Code of the West' puts an envelope around what I see Wyoming stands for — an opportunity for people to participate in their environment. People have great core values and demonstrate a high degree of integrity and honesty. You don't find that everywhere. In rural Wyoming, if you say you are going to do something, you're sure going to give a shot at getting it done. It's also a great place to raise a family."

Geis and his wife have a son, a daughter, and four granddaughters. They've also shared their home with 15 foster children the past few years.

If you were between Wheatland and Craig, Colorado, in July, you may have passed Geis and three other bicyclists in their effort to raise money for the Wheatland hospital foundation. This is the second year for the 526-mile ride.

"When I'm out on my daily 20-mile training rides, I ask myself 'why I'm doing it?" he reflects. "It helps others, and it also builds relationships. Everybody relies on everybody else to get through it."

The four cycled from Wheatland to Laramie, then to Walden, Steamboat Springs, and Craig, Colorado, then to Baggs, Saratoga, Laramie, and back to Wheatland.

"It was interesting and challenging," he says. "I said, 'Let's go see what we can get done.' It's been a very rewarding endeavor, taking something from ground zero and creating and developing not only the bank building but the furniture, artwork, and portfolio and the relations that come with Platte Valley Financial Service Companies, Inc. Our footprint covers the eastern side of Wyoming and western Nebraska."

There are offices in Wheatland, Casper, Torrington, Cheyenne, Wyoming, and Scottsbluff, Minatare, Morrill, and Bridgeport, Nebraska. "Their philosophy of customer service and giving back to the community really fits well with my personal philosophy," Geis notes. "You leave the world a better place than how you found it."

There was a professional carrot, too. Geis had always been in the top five out of 500 lenders with Farm Credit Services but could never change how it operated. "In a \$5 billion organization, unless you are the leader, you don't have the ability to change the way it sails," he says. "I could see at Platte Valley Bank I could have the latitude to paint my own picture. It's been very rewarding." &

AG APPRECIATION Legacy Award goes to longtime microbiology

By Robert Waggener, Editor Office of Communications and Technology

This year's Legacy Award goes to a longtime College of Agriculture faculty member who helped launch the microbiology program, established a scholarship fund for students, and was considered an exceptional teacher.

"Dr. Leroy Maki has made a lasting difference in the microbiology program both in terms of teaching and financial support," says Anne Leonard, college relations officer for the College of Agriculture.

Adds Department of Veterinary Sciences Professor E. Lee Belden, who had Maki as a teacher and then became a colleague: "Teaching was clearly a very strong point of Dr. Maki's. He was well prepared, very well organized, and as honest a person as you could find. He taught life lessons, and one way he did that was by having a genuine concern for his students."

Leroy (pronounced LaRoy) Maki taught microbiology in the College of Agriculture from 1955 to 1990.

"I most enjoyed the association with the students," said Maki during a calm July morning at his Laramie home. "I enjoyed teaching them, and I was always in the laboratories helping them."

Maki says he quickly found that teaching became a two-way street. "I learned because the students asked me a lot of questions that really made me think. It was very stimulating. If I didn't have the answer, we would work to find it."

Maki adds he also enjoyed research

but didn't like the administrative end of being a faculty member, especially when he learned about the proposal to split the then Department of Microbiology and Veterinary Medicine into the Department of Molecular Biology and the Department of Veterinary Sciences.

"That was a real hassle," he says.

Belden, though, says one of the things Maki brought to the table no matter what he was doing was equity. "He was fair in dealing with everyone. He has served as a role model for many, many people."

Belden had Maki as a teacher beginning in 1959, and then Maki served on his master's committee.

"He set a great example for me," Belden says. "When I became a teacher and a colleague of Dr. Maki's, I tried to pattern myself after him. I succeeded in some aspects, like being genuinely concerned about students, but I've never achieved Leroy's level of organization in the classroom. His teaching was very complete." Maki says his organization, dedication, and love for teaching stems back to his work as a young boy on the family dairy farm in Skamokawa, Washington.

"The whole family worked on the farm. We milked cows twice a day, cared for the chickens, and raised hay. That gives you a sense of responsibility," Maki says. "My mom instilled in all of us boys a curiosity (Maki has two brothers). We were all interested in the world around us and how things worked. I am sure that spilled over into my school and teaching. When I understood something, I could explain it better to others, and if I didn't understand something, I would seek answers."

Maki served in the Army from 1945-46, earned bachelor's and master's degrees in bacteriology and public health from the former Washington State College in Pullman, and then received his Ph.D. in bacteriology in 1955 from the University of Wisconsin-Madison.

His interest in bacteriology started in the Army when, as a member of the medical corps, he was assigned to a military hospital in Utah.

"I worked on the wards making beds and helping patients in and out of the operating rooms. I saw people working in the hospital laboratories, and it looked interesting," Maki recalls. "When I went to Washington State, I initially started in medical technology, and one of the first courses I took was bacteriology. The gentleman who taught the course was really interesting, and he encouraged me to major in bacteriology."

Maki says that faculty member along with a woman who taught medical bacteriology became great mentors.

"I used them as models for a lot of my teaching. They were very good instructors to begin with, very disciplined in their fields, and they developed great relationships with their students," Maki remembers.

Maki started at UW in 1955 as an assistant professor. He and three colleagues built the microbiology program.

"It's something we passionately wanted to do. A challenge is always easier when you are really interested in achieving it," he says.

During his tenure in the college, Maki

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faculty member

was honored with numerous awards, among them the Amoco Foundation Good Teaching Award, University of Wyoming's John P. Ellbogen Meritorious Classroom Teaching Award, and the College of Agriculture's Lawrence Meeboer Outstanding Teaching Award.

Asked why he believes he was recognized for his teaching, he responds, "My rapport with students."

Maki, 82, established the Leroy and Martha Maki Scholarship shortly after his wife died in 1989 to honor Martha and to help students interested in microbiology. He continues to contribute to the endowed scholarship, and two to four students annually receive awards.

"Dr. Maki and his family faithfully attend the college's annual scholarship banquet," Leonard says. "He is always seated with the current recipients of the Maki scholarship. Students like being able to connect a person or family to their award, and our donors enjoy meeting current students."

Maki says he's keeping busy during retirement performing community service, including genealogy, and singing. He's a member of the First United Methodist Church choir, Gem City Gents Barbershop Chorus in Laramie, and Wyomingaires Chorus in Cheyenne.

He has become a great resource for people across the country and beyond seeking genealogy information in Albany County and surrounding areas. He voluntarily helps them by looking up marriage, obituary, cemetery, and land records, and he takes photos including ones of homesteads



and gravestones. He receives, on average, two to five requests a month.

"A lot of the requests are very interesting historically. I had one recently from a woman whose great-grandfather is buried southeast of Laramie near Ames Monument. She was looking for the burial records and was wondering how he died." Maki determined the man was digging a well on a ranch, and the well collapsed on him.

A woman from England inquired about her great-uncle who homesteaded near Laramie Peak, and she, too, wondered how he died. "I was able to determine he died after getting hit by lightning," Maki says.

The woman flew to Laramie, and Maki took her to St. Matthew's Episcopal Cathedral, where the great-uncle's family worshiped. He also took her to the homestead. "It was quite an experience for her," he says. "The wide open plains are quite different than England."

He adds, "Genealogy is a very interesting hobby."

As the interview wrapped up, Maki shared another interest: "It's time to go hiking." &

AG APPRECIATION Y-TEX Corporation of Cody is College of

By Steven L. Miller, Senior Editor Office of Communications and Technology

A direct response by taking a swat at biting insects that pummeled Wyoming sheep with the bluetongue disease and the sheep ked is one of many reasons Y-TEX Corporation of Cody is the recipient of the Research Partner of the Year award.

The company, established in 1967, manufactures identification ear tags, insecticide ear tags, and other animal health products such as dusts and pour-ons that target livestock insects. The company, which employs approximately 120, created its first impregnated ear tag for control of the Gulf Coast ear tick on cattle in southern states, and it now manufactures insecticide cattle ear tags for various pests. These tags are marketed in the U.S. and exported from Cody to 12 countries.

"Since then, Y-TEX has become a national leader in developing insecticide ear tags and other specialty insecticide formulations for the livestock industry," says Jack Lloyd, professor emeritus in the College of Agriculture's Department of Renewable Resources. "They have been particularly instrumental in developing products to prevent and control insecticide resistance."

Y-TEX began by making identification ear tags, says Joe Kellerby, vice presidentspecialty products for the company. "We became involved in animal health more than 30 years ago experimenting with slow-release ear tags for controlling ectoparasites (pests that infest outside the body) of cattle."

Company officials have worked with many land-grant universities, including

Montana State University, Oklahoma State University, and UW. "Environmental Protection Agency (EPA) regulations dictate you can't sell insecticide products without the EPA's approval, and that requires lots of efficacy and safety data to support the product and back up the label claims," notes Kellerby.

Collaborations with universities help provide that. Y-TEX was led to Jack Lloyd when trying to control cattle lice with insecticide ear tags and with insecticide



History of the name

Y-TEX Corporation was formed by two businessmen from Texas and one from Wyoming in 1967. The manufacturing operations were managed by an office in Cody while the marketing was initially managed by an office in Texas. All operations were subsequently consolidated in Cody. As it was originally a joint venture of residents in Wyoming and Texas, the owners wanted the name to represent both states. The first attempt at the name was spelled "WY-TEX," but this was subsequently shortened to Y-TEX to obtain a unique and valid trademark for permanent use, note company representatives.

pour-ons. "That is what specifically led us to Jack Lloyd," says Mike Fletcher, director – parasiticide development. "Dr. Lloyd is a world-renowned expert on cattle lice."

Y-TEX has provided funds to support research and graduate training in the college and co-hosted the annual Livestock Insect Workers' Conference in Cody, says Lloyd, and it has contributed generously to the Lloyd Veterinary Entomology Gift Fund, including the Lloyd/Kumar fellowship in entomology.

Y-TEX also donates ID tags and applicators to 4-H, FFA, the Department of Animal Science at UW, and the Steer-A-Year program, and it is a member of the Cowboy Joe Club.

There are many drug companies and insecticide formulators that support the development of products for livestock pest management, but Y-TEX is different, says Lloyd. "Y-TEX is special because it has supported expansion of labels and development of unique formulations needed by the smaller producers and limited markets in places like Wyoming. These are activities the bigger pharmaceutical companies simply wouldn't touch. Of particular value is its support in navigating these products through the regulatory process of the EPA."

A 2007 bluetongue outbreak in Wyoming's Big Horn Basin killed more than 300 sheep and sickened hundreds more. The response for an acceptable insecticide to address the outbreak was fairly quick. "Development of new products can take more than three years," says Kellerby. Because it already had the PYthon Insecticide Cattle Ear Tag, an effective EPA-registered product for use

WEEKEND Agriculture Research Partner of the Year

on cattle, approval for sheep use as a Special Local Need (SLN) registration came in about three months. Letters of support from university experts also hastened the process.

A biting gnat transmits bluetongue, a viral disease, and the sheep ked is a bloodfeeding parasite that causes serious pelt defects. "As a result of a cooperative effort involving UW, Y-TEX, and the Wyoming Department of Agriculture, Wyoming now has a state SLN label for sheep use of the PYthon ear tag, which repels the biting gnat that transmits bluetongue. It has also been shown to control the sheep ked. Y-TEX, again in cooperation with UW, is preparing to submit a product application to the EPA based on cooperative work in Wyoming for a liquid sheep insecticide that is effective against the gnat," notes Lloyd.

With the approval of European Union authorities, Y-TEX is now testing the PYthon tag on sheep and cattle in The Netherlands to combat a bluetongue outbreak.

In the development of effective products, companies like Y-TEX plan for and monitor insect resistance against their own products and strategically plan for products their competitors may bring to the market. "The process may take six or more years," says Kellerby. "We try to anticipate resistance issues."

Case in point is a new ear tag containing abamectin to control the horn fly, the XP 820 Insecticide Cattle Ear Tag, against which horn fly resistance has not been demonstrated. With that new tag, the company has developed an annual tag rotation program using three unrelated chemistries to counteract horn fly resistance.



Mike Fletcher, left, and Joe Kellerby with products manufactured by the Y-TEX Corporation. At far left is the PYthon insecticide ear tag, initially marketed for cattle use and now for sheep against the biting gnat that causes bluetongue disease and against the sheep ked.

"I first started working with that chemical in 1998," Kellerby notes. "It's just on the market this year, having been approved in January. That is an extreme example of the time requirement. In that case, it took probably seven to eight years to develop the product and about two years to get it through the EPA." On the safety side, Fletcher notes the insecticide impregnated in the company's products bleed out very slowly from the tag until the tag essentially stops releasing after several months. "Once the tag is at the end of its life, it has released most of the insecticide it can," he says. &

Molecular biology department hosting Nobel Prize winner

By Robert Waggener, Editor Office of Communications and Technology

The Department of Molecular Biology is hosting Nobel laureate Dr. J. Michael Bishop on Friday, September 25. His visit coincides with Ag Appreciation Weekend.

In a presentation open to the public, Bishop will talk about the molecular biology of cancer and the surprising discovery that normal genes can cause cancer under certain circumstances, which was the subject of his Nobel Prize in 1989.

"Professor Bishop identified many genes associated with the development of cancer, which are now generally known as 'oncogenes,' and he discovered these genes are derived from certain normal cellular genes, which are now generally known as 'proto-oncogenes,'" says Department of Molecular Biology Professor Don Jarvis, who first met Bishop in 1985 while attending graduate school at Baylor College of Medicine in Houston and will be hosting his visit to Laramie.

Jarvis says the discoveries identified key genetic markers that can be used for diagnosis and specific targets that can be used to develop chemotherapeutic agents against various types of cancer.

"I knew that Professor Bishop is an outstanding physician-scientist and communicator, and I've wanted to bring him to the University of Wyoming ever since I joined the molecular biology faculty in 1998," Jarvis says. "I also knew Professor Bishop is an avid outdoorsman and that he worked in Yellowstone National Park during his early years, so I thought that might be a hook."



Dr. J. Michael Bishop

The talk will begin at 2:10 p.m. in Room 103 of the Animal Science/Molecular Biology Building, and a reception will follow.

Bishop, who is at the University of California, San Francisco (UCSF), and his long-time collaborator, Dr. Harold Varmus, were awarded the Nobel Prize in Physiology or Medicine for their discovery of the cellular origin of retroviral oncogenes.

Proto-oncogenes are members of a large family of genes whose products control normal cell growth and division. Bishop and Varmus found that alterations in one or more of these so-called proto-oncogenes can give rise to oncogenes, whose products can transform normal cells and lead to the development of cancer.

"Professors Bishop and Varmus spent most of their careers studying retroviruses, which are viruses that can cause cancer," Jarvis says. "Their transformative contribution was the basic finding that viral oncogenes are derived from normal cellular genes encoding proteins with key roles in cell growth and/or division. Viral and other oncogenes, however, are modified versions of these genes, which can provoke cellular growth and/or division in abnormal ways."

In essence, Jarvis says, the production of these gene products can convert a normal cell to a cancer cell. "Many leukemias are very good examples of this," he notes.

Jarvis says he believes the general public, not just molecular biologists and other scientists, will find Bishop's presentation fascinating for several reasons.

"The talk will focus on a subject that either has or probably will touch all of us in our lifetimes," says Jarvis, who notes nearly everyone is affected by the disease, either by getting cancer themselves or having a family member or close friend become sick.

Jarvis says he also believes those attending will personally relate to Bishop because of his enthusiasm, energy, and interesting personal and educational background.

"Professor Bishop received the first eight years of his education in a two-room schoolhouse and has stated he actually had very little exposure to science during that time. In his autobiography, Bishop describes being strongly influenced by a teacher who taught all subjects for grades five through eight in a single room, was a fierce disciplinarian and strict grammarian, and who enforced good penmanship with a vengeance."

Jarvis speculates this influence must have contributed to Bishop's passion for good writing and to his ability to communicate in ways that are not only understandable but elegant and entertaining.

— Continued on Page 32

Agricultural and Applied **Economics**

The Department of Agricultural and Applied Economics has launched three research projects to help assess the economics of wildlife-livestock diseases in Wyoming.

Though most of the focus is on brucellosis, other diseases are also of interest, including pasteurellosis in domestic and bighorn sheep, bovine tuberculosis in cattle and big game, including deer and elk, and foot-andmouth disease.

"I see brucellosis as the core part of the department's work in looking at the relationship of wildlife and livestock diseases," says Associate Professor Roger Coupal, head of the department. "The idea is to build alternative disease policies that minimize the economic effects on agriculture, wildlife-related businesses, and the state as a whole."

He adds, "We're one of the few departments in the country looking at the economics of wildlife-livestock disease issues."

Leading the research are assistant professors Dannele Peck and Ben Rashford. The projects include:

Estimating the cost to indi-٠ vidual cattle producers of adopting various brucellosis management practices, including adultbooster vaccination, delayed grazing in high-risk allotments, spaying heifer calves, running steers/spayed heifers rather than cow-calf pairs, and fencing, hazing, or modifying winter feeding practices to reduce commingling with elk. Graduate student Trent Roberts of Walsenburg, Colorado, who received his bachelor's degree in agricultural business



from the University of Wyoming in May, will begin working with cattle producers this fall.

Quantifying the effects of elk population and hunter success on demand for guided elk hunts in the Greater Yellowstone Area. Brucellosis management policies that intentionally or inadvertently reduce elk populations could reduce hunter success and therefore decrease demand for guided hunts. Graduate student Mandy Kauffman of Traverse City, Michigan, is working on this project for her master's thesis.

Performing a regional eco-• nomic analysis to determine the potential for a split-state regulatory framework to reduce the cost of future brucellosis outbreaks. Graduate student Bryan Wilson of Lander, who received dual bachelor's degrees in agricultural business and animal and veterinary sciences from UW in May, is working on this project for his master's thesis.

The projects are funded by the Wyoming Wildlife/Livestock Disease Research Partnership, state of Wyoming's Federal Natural Resource Policy Account, and the U.S. Department of



Ben Rashford

Agriculture's Cooperative State Research, Education, and Extension Service Special Research Grants Program.

Animal Science

Philipe Moriel placed second out of 11 entries in the 2009 Western Section of the American Society of Animal Science (WSASAS) Graduate Student Paper competition in June at Colorado State University (CSU) in Fort Collins.

Moriel, of Brazil, is working on a master's degree under Professor Bret Hess in the Department of Animal Science nutrition laboratory.

Students were scored on oral presentations and written manuscripts. Moriel's paper was "Camelina meal and crude glycerin as feed supplements for developing replacement heifers."

Moriel received \$300 from Zinpro Corporation, which is headquartered in Eden Prairie, Minnesota, and makes performance minerals for animals.

Rebecca Cockrum of Arkansas, a master's student working under Assistant Professor Kristi Cammack, combined with Moriel to win the WSASAS Institutional Award.

Zinpro presented the department \$2,000 for having the two highest placing entries from the same school.

"This is the fifth year out of the seven years the Institutional Award has been presented that it has been won by Department of Animal Science students," says Professor **Doug Hixon**, head of the department. "The prize money is to be used to support graduate student travel to future meetings."

Cockrum's paper was "Breeding performance of Suffolk ewes administered subacute levels of dietary nitrate."

Also competing were students from CSU, Montana State University, New Mexico State University, North Dakota State University, Oregon State University, Texas A&M, and Utah State University.

The department in July hosted the National Junior Suffolk Show at the Cliff and Martha Hansen Livestock Teaching Arena west of Laramie. Lance Miller, University of Wyoming livestock judging team coach, served as the onsite coordinator. He was assisted by Brent Larson, manager of the College of Agriculture's Sheep Unit west of Laramie, and David Moore, farm manager of the Laramie Research and Extension Center.



Philipe Moriel

PROGRAM NOTES



Rebecca Cockrum

Youths from approximately 25 states exhibited some 200 sheep and participated in a multitude of educational activities during the four-day event.

Family and Consumer Sciences

The Early Care and Education Center staff is awaiting notification of the site visit for its National Association for the Education of Young Children's (NAEYC) re-accreditation.

Director Mark Bittner, curriculum coordinator Nikki Baldwin, office assistant senior Tracy **Goodspeed**, and all of the teachers have worked on the candidacy materials and documentation required for accreditation. NAEYC accreditation is a strong measure of early childhood program quality, says Professor Karen Williams, head of the Department of Family and Consumer Sciences. It assesses curriculum, environment, program administration, financial policies and fiscal responsibility, nutrition and health, parent involvement, and other key aspects of the early childhood standards. According to Bittner, "By participating in the self-study process, programmatic changes are made, which benefit the families, staff, and children.



Mark Bittner

These changes help assure students using the facility for internships and practicum experiences have a model that reflects the highest level of appropriate early care and education."

Associate Professor **Shane Broughton** taught a high school institute course "What's for Dinner? – If There is Any." The course was designed to help students gain an awareness of the magnitude of hunger and nutrition problems worldwide. "These problems are present in Wyoming as well as Africa and Asia," Broughton asserts. "Students need to be aware of the known as well as the hidden consequences of the world's current hunger problems."

Students had the opportunity to prepare meals average people consume daily in the areas of the world that have the greatest hunger problems, view videos, participate in role-plays, and take a field trip to Cheyenne to gain an idea of the hunger problems in Wyoming and what is being done to address the issue in our state.

Molecular Biology

Researchers from the Department of Molecular Biology and an institute in Germany have completed a project that, for the first time, has identified how sunlight changes activity of a particular class of proteins called BLUF domain photoreceptors. BLUF is short for Blue Light Using Flavin adenine dinucleotide.

The research could lead to developments that could help keep harmful bacteria from progressing to a state in which they can become 10,000 times more resistant to antibiotics.

The team published a paper in the June 18 edition of *Nature*, a premier science journal.

Leading the Department of Molecular Biology team was Associate Professor **Mark Gomelsky**. Two Ph.D. graduates of the department, **Natasha Kirienko** and **Dmitri Ryjenkov**, both of Russia, are co-authors.

"My group asks very basic questions about how bacteria interact with their environment," Gomelsky says. "We believe applications of this knowledge for human health can be profound."

While traditional treatment of infectious diseases has been to kill the bacteria, Gomelsky believes researchers need to learn how to control bacterial behavior to modify the progression of infectious diseases.

Collaborating in the research and co-authoring the paper are sev-



Associate Professor Mark Gomelsky

en scientists from the Max Planck Institute for Medical Research in Heidelberg, Germany.

Gomelsky, who recruited Kirienko and Ryjenkov to the University of Wyoming from Russia, says publishing a paper in *Nature* is very prestigious. He notes this is the first time in more than five years UW students have been coauthors of an article in the journal.

Kirienko earned her doctorate degree in 2008 and is a post-doctoral researcher in the laboratory of molecular biology department Associate Professor **David Fay**.

Ryjenkov earned his Ph.D. in 2006 and is a research scientist at a ChemDiv Inc. facility in Moscow. ChemDiv is a U.S.-Russia biotechnology company with headquarters in San Diego.

Additional information about the research is in the July issue of *Agademics* at www.uwyo. edu/uwexpstn/Agademics/Agademics_main.htm.

The paper is at www.nature.com/nature/journal/v459/ n7249/abs/nature07966.html.

Plant Sciences

The Department of Plant Sciences continues to fill faculty positions vacated by departures and retirements of recent years. Three new faculty members have been hired, notes Associate Professor **Steve Herbert**, chair of the department.

Urszula Norton began August 18 as an assistant professor of agroecology. Norton earned a master's degree in horticulture from Warsaw Agricultural University in Warsaw, Poland, a second master's degree in agronomy from Iowa State University, and a Ph.D. in forestry from the University of Montana. Most recently, Norton served as





Urszula Norton

an adjunct assistant professor in the Department of Renewable Resources at UW. Norton will also contribute to teaching of the agroecology undergraduate program.

Steven Keeley will begin work as an associate professor of horticulture on September 28 at the Sheridan Research and Extension Center and serve as director of the station. Keeley earned a master's degree in crop and soil sciences from Michigan State University and a Ph.D. in horticulture from Colorado State University. He has extensive teaching experience and will be a major contributor to the series of upper division horticulture and agroecology classes offered by UW to the Sheridan area, which began this fall.

Brian Mealor will begin as an assistant professor of weed science in Laramie on November 2. Mealor earned a master's and a doctorate degree in rangeland ecology and watershed management from UW and most recently served as director of stewardship for The Nature Conservancy in Wyoming. He will serve as a UW faculty extension specialist addressing invasive and range weed problems across the state.

Renewable Resources

Ten undergraduate and two graduate students, two UW faculty members, and two high school science teachers spent two weeks in June at the Yanayacu Biological Station and Center for Creative Studies on the eastern slopes of the Ecuadorian Andes. Led by Scott Shaw, professor of entomology, the research is a continuation of his study of tropical plants, caterpillars, and wasps.

In the group were Shaw, Greg Brown, professor of botany in the College of Arts and Sciences, two graduate students, five undergraduate researchers, five undergraduate honors students, and two science teachers. The honors students were enrolled in the cloud forest ecology class (HP 4152) taught by Shaw and Brown. Funding was provided by the National Science Foundation, UW International Studies Programs, UW Honors Program, UW School of Environment and Natural Resources, and the UW College of Agriculture. Interest in the research and station has grown: three years ago only Shaw made the trip from UW; last year six traveled to the station, which is at 7,100 feet and encompasses nearly 5,000 acres of cloud forest.

"It was very good all around," says Shaw. "The graduate students generated data for their theses, and the research team helped us gather data, photographs, and videos." The two teachers are former students of Shaw. Drew Townsend, a former graduate student of Shaw's, is manager of the station.

Veterinary Sciences

The W. Richard and Barbara Andrau Powell Wildlife/Livestock Disease Training Fund helped enable two graduate students in the Department of Veterinary Sciences take two short courses at the Johns Hopkins Bloomberg School of Public Health.

During their trip to Baltimore, Maryland, in June, Laura Meadows and Dave Edmunds took an epidemiology course and one on survival analysis techniques.

The epidemiology class provided students with tools and techniques to study the health of human and animal populations and the effects of disease on those populations. In the analysis course, participants learned specific tools for studying survival and mortality in populations and



Professor Scott Shaw



Laura Meadows



Dave Edmunds

how these processes affect populations over time.

"We thought this would be a great experience for Laura and Dave to get more training related to wildlife diseases and to take advantage of the expertise at Johns Hopkins in epidemiology and disease research studies," says Todd **Cornish**, an associate professor in the department. "They learned a great deal."

Edmunds, of Roanoke, Virginia, is a Ph.D. student in animal and veterinary sciences (ANVS). He is studying chronic wasting disease in white-tailed deer.

Meadows, who is from the small northwestern Wyoming community of Wilson, is completing her master's degree in ANVS. She is studying brucellosis in elk.

An integral part of both of their research projects involves epidemiology. Though the class focused on human epidemiology, Edmunds says, "The concepts are still applicable to the study of wildlife diseases."

He adds, "It was good to get a different perspective outside of our department. It allowed us to draw from the experiences of others, and it gave us additional tools to look at the different fields of

epidemiology between human, wildlife, and livestock health. It gave us a different perspective that we can apply to wildlife disease research."

About the survival analysis class, Edmunds notes, "It was extremely intense - very math and calculus intensive."

Professor Don Montgomery, head of the Department of Veterinary Sciences, said at press time that a faculty search for an epidemiologist was underway and among the duties will be teaching an epidemiology course.

Agricultural **Experiment Station**

Rainfall blessed the state this spring and summer with crops and pastures responding favorably. After nine years of serious drought, it has been very nice driving around the state and seeing the landscape green, notes Stephen D. Miller, associate dean in the College of Agriculture and director of the Wyoming Agricultural Experiment Station.

Research in the College of Agriculture and at the four research and extension (R&E) centers is designed to improve the profitability of farms and ranches, ensure Wyoming agriculture delivers quality products to meet the growing food and renewable energy challenges, protect the environment, understand and provide solutions to climate change, and ensure our communities are better prepared to cope with challenges they face, says Miller.

Steven Keeley will start September 28 as the director of the Sheridan R&E Center.



Steven Keeley

Keeley replaces Justin Moss, who took a position at his alma mater, Oklahoma State University, last fall. Keeley comes to us from Kansas State University where his specialty was turf grass science. In addition to his duties as director, Keeley will teach in the third-year agroecology program (a joint venture between UW and Sheridan College) and do research on various aspects of turf grass management. "We are extremely excited to have an individual of his caliber at Sheridan," says Miller.

An offer was made to an agronomist/irrigation specialist to be at the Powell R&E Center. This individual will have statewide responsibilities for irrigation management. "We are extremely excited to get the position filled," says Miller. "This individual replaces Alan Gray, who retired in 2007 after being seriously injured in a freak accident while harvesting forage plots."

All construction has been completed at the James C. Hageman Sustainable Agriculture R&E Center (SAREC) near Lingle. The congregate residence and wet lab are fully

functional and ready for use. Jim Krall, research director, has returned to work full time after being slowed for several months by heart problems. "Jim reports record numbers of research projects and individuals working at the center. What is even more exciting is the fact many of these projects truly integrate crop and livestock systems," notes Miller.

The Laramie R&E Center has seen considerable change in recent months. The GrowSafe system is fully functional and is being used full time for sheep research. "We are in the process of building a new pellet mill at the Animal Science farm that can formulate all pellets required in our feeding trials at both Laramie and SAREC," Miller says. "In addition, the remaining three sections of the greenhouse are being fitted with Johnson Controls Inc. panels, and construction has started on the \$24.9 million biosafety level 3 addition at the veterinary sciences lab. Both of these additions will greatly expand our research capabilities."

Cooperative **Extension Service**

Eric Peterson, West Area educator for sustainable management of rangeland resources based in Sublette County, was recognized at the 2009 spring meeting of the Wyoming Stock Growers Association with the **Outstanding Range Professional** Award. Peterson has been a leader in range management education throughout his 30-year career with the University of Wyoming Cooperative Extension Service (UW CES).



UW CES Director Glen Whipple and Rhonda Shipp

Glen Whipple, associate dean and director of UW CES, presented Rhonda Shipp with a gift of appreciation at a retirement reception in Cody May 29. Shipp, community development education area educator based in Park County, retired June 1 after 30 years with CES. Shipp has been honored by CES and UW throughout her career for extraordinary teaching skills that have resulted in impacts for clientele and the communities she served and innovative program development. The consummate extension professional, Shipp mentored and trained many extension educators. The UW trustees recognized Shipp with emeritus status, which is available only to retiring faculty members and academic professionals who have given long and distinguished academic service to the university.

Jenny Good assumed the 4-H educator position in Big Horn County May 13. Good is a May 2009 graduate of UW with a bachelor's degree in agricultural communications with emphasis in animal science.





Tara Kuipers joined CES July 28 as the Northwest Area educator for community development education based in Cody. Kuipers is a UW graduate with a master's degree in education with emphasis in counseling and student affairs in higher education. Her bachelor's degree is in human development and family studies from South Dakota State University.

Academic and Student Programs

The College of Agriculture has been busy orienting its newest students. This summer, 110 incoming agriculture students came to campus to participate in student orientation. There were sessions for new freshmen, transfer students, students in the Honors Program, and students participating in Synergy, a nationally acclaimed learning community for first-year students that provides a challenging set of courses in a supportive environment.

Laurie Bonini, senior office associate in the College of Agriculture's Office of Academic and Student Programs, says the orientation sessions, called "Base Camp," incorporated a full schedule of workshops, resource fairs, informational meetings, small group discussions, and entertaining programming geared toward introducing students to college life. A separate schedule for parents was also included.

"For students, one of the most important pieces of Base Camp was being advised for fall 2009 courses. More than 45 College of Agriculture faculty and staff members assisted these new students in selecting courses, navigating the student information and registration systems, and learning about the college's programs and resources," Bonini says.

Students completed their campus visit by enrolling in fall courses.

As new students arrived on campus this fall, they participated in the second half of orientation – a three-day experience called "Summit 09," which helped students transition to the UW campus and college life. Summit activities included a president's welcome and reception, guest speakers, and small group experiences focusing on academic support and strategies for applying personal strengths to college success.



Senior Office Associate Laurie Bonini

"Students will also participate in a campus or community activity. For agriculture students, this will include riparian cleanup, composting at the ACRES Student Farm, or exploring potential health risks in the community," Bonini says.

Students involved in ACRES, short for Agricultural Community Resources for Everyday Sustainability, are operating a small-scale compost program and growing crops near the College of Agriculture greenhouse facilities. Other students will clean along the Laramie River and learn more about that ecosystem, and a third group will take a tour through downtown Laramie to learn about potential health risks.

College Relations

The 26-member College of Agriculture Dean's Advisory Board includes alumni, representatives from agriculture groups, and industries that work closely with the college. Together with Dean **Frank Galey**, the advisory board focuses on three strategic areas – marketing the college, careers, and fundraising, says **Anne Leonard**, college relations officer for the College of Agriculture.

The career subcommittee encompasses a broad range of activities, from promoting our programs to potential employers to helping students with job placement strategies, she notes.

"One of the challenges the agriculture industry faces is helping young people understand the wide range of careers available to them within agriculture. Promoting our degree programs to potential students falls under the marketing group. Promoting the College of Agriculture as a source



of accurate and timely information is another area of interest for the marketing subcommittee," says Leonard.

The college is committed to providing an exceptional educational experience for students, quality outreach programming for Wyoming citizens, and research that will benefit the agriculture industry and stakeholders. Gifts from individuals, corporations, and foundations are the key to meeting this goal. Members of the development subcommittee are committed to working with the dean to increase giving to the college.

To submit suggestions for marketing, contact Galey at agrdean@uwyo.edu or the contact person for each area. "We look forward to hearing from you," says Leonard.

Marketing – **Anne Leonard** at (307) 766-4133, aleonard@ uwyo.edu;

Careers – **James Wangberg** at (307) 766-4135, agrdean@ uwyo.edu;

Fundraising – **Stephanie Anesi** at (307) 766-1800, sanesi@uwyo.edu.

University of Wyoming

AG NEWS

College of Agriculture Department 3354 1000 E. University Ave. Laramie, WY 82071

Nobel Prize winner — from Page 26

Bishop argues in his autobiography, How to Win the Nobel Prize – An Unexpected Life in Science, that scientists need to communicate better with the general public. "I enjoy writing and abhor the dreadful prose that afflicts much of the contemporary scientific literature," he writes.

Jarvis believes others might relate to Bishop because of his readily admitted struggle to find a focus in his academic life. At various times, Bishop thought about becoming a medical doctor, historian, philosopher, and musician, Jarvis says, "but never a scientist. Yet, he has clearly had an eminent academic career in science. He also has an eclectic range of other interests that one hesitates to describe as 'outside' interests."

Bishop writes, "If offered reincarnation, I would choose the career of a performing musician with exceptional talent, preferably, in a string quartet. One lifetime as a scientist is enough – great fun, but enough."

Jarvis says he can relate.

"A career of science, research, and teaching usually means a lot of long hours. You spend your whole career working really hard, focusing on science at the expense of many other things. But, it's clear to me Mike Bishop has risen above the norm. He is one of those rare individuals who has made exceptional contributions in his scientific career but also has an exceptionally broad range of knowledge in many other academic areas, including music, art, and history," Jarvis says. "Simply put, Mike is the model of a Renaissance man."

Bishop, 73, joined the UCSF faculty in 1968 and was named chancellor in 1998, a post he held until stepping down in June. While serving as chancellor, he continued to teach medical students and direct his distinguished research lab. He continues to serve on the UCSF faculty as a professor in the Department of Microbiology and Immunology and as director of the G.W. Hooper Foundation, a biomedical research unit at UCSF.

"There is one more story that helps to put Mike's life in perspective," Jarvis says. "He is an avid San Francisco Giants fan, and the original schedule for the press conference announcing his Nobel Prize conflicted with a key game during the National League playoffs between the Giants and Chicago Cubs. The press conference was held, but the time was changed so he could be at the ballpark in time for batting practice."

The title of Bishop's UW presentation is "Enemies Within: Proto-oncogenes and Tumorigenesis." More information about Bishop and the Nobel Prize is at http:// nobelprize.org/nobel_prizes/medicine/ laureates/1989/.

Organizing Bishop's visit to UW are Jarvis and Anne Leonard, college relations officer for the College of Agriculture. &