

Mizzou Weekly

July 7, 2010 Volume 31, No. 33

Reducing research risks



Workers last week cleared debris from a biochemistry lab in Schweitzer Hall that exploded June 28. Following an inspection, scientists and students returned to work in Schweitzer later that week. An investigation will determine if any additional actions are necessary to prevent this type of accident from occurring in the future. Nicholas Benner photo

Back to work

MU is calling on campus and outside experts to investigate Schweitzer blast

It may be a bit premature to say things are back to normal at Schweitzer Hall following a June 28 explosion in a biochemistry laboratory there. Plywood covers the windows of the lab on the northeast side of Schweitzer, but scientists and students are back to work.

Officials have declared the building structurally sound and safe for researchers to resume activities in other parts of the building. An investigation, which is standard operating procedure in such situations, will determine if any additional actions are necessary to prevent this type of accident from occurring in the future.

Four individuals, including a graduate student, a research scientist and two post-doctoral fellows, were injured in the blast and transported to University Hospital. Following the incident, crews from MU Campus Facilities and Environmental Health and Safety assessed the damage and are cleaning the laboratories. After an inspection, crews deemed the rest of the building structurally safe and allowed researchers and staff access to the building to resume work.

In addition to a rigorous inspection of Schweitzer Hall to ensure its structural integrity, MU officials are investigating the events that led up to the explosion, Chancellor Brady Deaton said during an interview on KFRU radio last week.

“We have been looking at every detail of this,” Deaton said. “We have very good oversight over these kinds of issues, but there are always some risks associated with scientific work, and I think the public should recognize that because of all the benefits we get from science. In this case, the researchers were very careful to look at themselves, asking, ‘What could we have done differently to have prevented this?’ ”

Following the explosion, an official with the Columbia Fire Department initially attributed the incident to human error. The fire department later retracted that original assessment. Deaton said it is not completely clear what triggered the explosion. Investigators are exploring a number of hypotheses and have consulted with campus and national experts, including a national laboratory.

“We will be drawing on both internal and external experts across the world, as needed, to ensure that we have the absolute safest environment possible for our faculty, staff and students,” Deaton said. “That is our predominant concern. We are going to look at every detail until we get to the bottom of it.”

Three of the four people injured in the accident were treated at University Hospital and released that day. Last week, Deaton visited the one individual who was hospitalized overnight. “She was doing quite well; she was just very thankful that this turned out as well as it did,” he said. “Under the circumstances, I think everyone is very, very pleased that there were so few injuries.”

Accidents can occur sometimes under the best of circumstances, he said. “The laboratory is operated by one of our absolutely stellar scientists, Dr. Judy Wall,” Deaton said. “She is doing some of the most important work in the world in her field today. Her laboratory reflected that; it was beautifully organized, very well kept. She has some of the top people in the nation working with her. So, under the absolute best circumstances, with one of our best researchers, an accident can happen.”

Wall’s research focuses on using anaerobic bacteria to remove radioactive metals from the environment. Over the years, she has been funded by a number of federal agencies, including the National Science Foundation and the Department of Energy.

MU officials have said that the laboratory will be completely rebuilt.

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Summit eases students' transition from backpack to briefcase

Job fare

Mizzou collaborates with business to meet their changing needs

It was a win-win situation. In June, dozens of businesses came to campus to learn how to better collaborate with MU to prepare tomorrow's workforce.

Mizzou, in turn, learned how such collaborations could ensure that the academic programs offered and the quality of graduates produced meet the changing needs of industries so that the transition from backpack to briefcase will be smoother.

The joining of forces took place June 23 at Mizzou's first ever Employer Summer Summit, held at the Reynolds Alumni Center and Cornell Hall. Throughout the day, 102 representatives from 61 visiting businesses, the majority of which are Fortune 500 companies, got firsthand knowledge of how Mizzou could help them reach their recruiting goals.

They attended workshops and an MU Showcase Fair, and took campus tours. The night before, members of the athletics department hosted a welcome reception at Mizzou Arena.

The summit was born out of an idea from the MU Career Services Council, said Tim McIntosh, assistant director of business career services for the Robert J. Trulaske College of Business. The bottom line was to beef up job prospects for MU's students. While the overall theme was "Showing our Stripes," the underlying message was: If you want dibs on students at the top of their field, get involved and partner with the university.

"This was a chance to collaborate and showcase what MU and corporate partners have had in the past and currently, and where we can take that in the future," McIntosh said. "We want to make sure we're doing everything we can to provide opportunities for our students."

One piece of evidence pointing to this goal is MU's commitment to position its curricula and programs with corporate needs. Rashel Kelly, senior team leader of campus recruiting for Cerner Corp., gave an example of how the company and MU are working together to thwart the shortage of engineers nationwide.

What started as a brief hallway chat last summer resulted in a pilot program in Kansas City in which students can go from high school to a community college and intern at Cerner. Afterward, the students may choose to stay at Cerner or finish their education at Mizzou.

"This project proved the university is nimble and responsive to your request," said Kelly, who received both a bachelor's and master's degree in business administration from Mizzou.

"This took a highly collaborative effort and broad thinking to get off the ground in six months," she said. "This is what you get when you partner with the University of Missouri. In less than a year, we have 30 students on board and a new curriculum and a certificate program. I doubt that we'd be able to partner with other institutions that quickly."

Charles Hunter, regional human resources manager for Commerce Bank, says he appreciated MU's faculty, staff and students taking the initiative to put the summit together and hopes it will be repeated next year. "Commerce has a long history and a deep relationship with Mizzou," he says. "We've done a lot of presentations on campus, worked with many programs and helped with internships and job shadows, but this gave us one time to hear from many areas at once. We want to deepen our partnership with Mizzou."

The summit also gave representatives from the bank an opportunity to hear an overview of MU's diversity efforts. "While we think we are doing and have done some good things with minority support, at the summit we began to explore additional ways that we can assist with employment and retention of minorities," says Hunter, who received a bachelor's degree in business administration from Mizzou. "We see it as a partnership of supporting a positive campus environment for minorities."

To learn more about the summit, call McIntosh at 882-9408 or e-mail mcintoshts@missouri.edu.

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'Pigging out' may offer clues to childhood obesity

Researchers will study how genes interact with diet and exercise

Obesity epidemic

In the past 30 years, childhood obesity has tripled with nearly a third of the children in the United States currently overweight. With the help of a Mizzou Advantage grant, University of Missouri researchers are using a small feral pig, known as the Ossabaw pig, to study childhood obesity. The pig, which has a predisposition to store fat, will help researchers better understand childhood obesity in humans.

"Our research will provide the science that will help policymakers make the best decisions about how to tackle the national epidemic of childhood obesity," says Frank Booth, a professor with appointments in veterinary medicine and medicine, and a research investigator in the Dalton Cardiovascular Research Center.

In the study, Booth and his team from several MU schools and colleges will learn what changes occur to the Ossabaw pigs when they consume a high-fat or low-fat diet and engage in different levels of exercise. This information will help scientists understand how genes interact with environmental factors, such as diet and exercise, in childhood obesity and identify the best prevention and treatment methods.

Spanish explorers introduced Ossabaw pigs to Ossabaw Island, one of the Sea Islands off the coast of Georgia more than 500 years ago. Over the years, the pigs that could best store fat were naturally selected during years when food was scarce. These pigs have a genetic predisposition to gain and store fat faster, which makes them a prime candidate when studying diet and exercise.

"Due to the way they store fat, these feral pigs are extremely similar to humans when they are obese and can provide us valuable insight into childhood obesity," Booth says.

Booth received the 2010 American College of Sports Medicine's Prestigious Honor Award for his work to understand cellular and molecular mechanisms' responses to exercise both anatomically and physiologically, his promotion of research within the exercise sciences and his leadership within the ACSM. At MU, Booth was a founding member of the Health Activity Center. The center conducts exercise research by pulling together experts from multiple fields, including biomedical sciences, physical therapy, nursing and physiology.

Mizzou Advantage was created to increase MU's visibility, stature and impact in higher education locally, statewide, nationally and around the world. The first round of funding, totaling more than \$900,000 supports proposals that boost existing faculty and community networks, create new interdisciplinary collaborations, strengthen the student learning experience, and propel Mizzou's research to the next level.

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Electronic health records increase efficiency, accuracy

Accurate access

Modern technology could help ease health worker shortage

In 20 years, approximately 72 million older adults will reside in the United States, almost double the current number, according to the U.S. Administration on Aging. Potential issues are compounded by the projected shortage of health care workers needed to provide elder care. As part of the solution, an interdisciplinary team of University of Missouri researchers is refining electronic health record technology to more efficiently meet increasing health care demands.

The MU researchers are developing an electronic health record system that encompasses standard health assessments and those obtained through new technologies. The goal is to increase efficiency and accuracy, improve patient outcomes and reduce costs for long-term care.

“As the use of emerging technologies increases along with the older population, maintaining complete and accurate patient information can be overwhelming,” says Marilyn Rantz, professor in MU’s Sinclair School of Nursing. “A comprehensive system that encompasses all measures, old and new, is the key to enhanced and efficient clinical decision making.”

The system is being tested at TigerPlace, an independent senior-living facility that helps residents age in place. According to the researchers’ initial findings, use of the electronic record system can enhance nursing care coordination and advance technology use and clinical research.

“New technologies to passively monitor older adults’ health are being developed and are increasingly commercially available,” Rantz says. “The challenge remains to integrate clinical information systems with passive monitoring data, especially in long-term care and home health settings, in order to improve clinical decision making and ensure patient records are complete.”

With access to comprehensive data, clinicians can make more informed clinical decisions, better perform risk assessments and provide risk-reducing interventions.

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Political protests spur more responsive government

In 2001, riots in Argentina protesting President Fernando de la Rúa's economic decisions overthrew him from office and killed almost 30 people. Latin American protests have resulted in numerous deaths and national crises since the 1970s, but also democratic reforms. Now, a MU researcher has found that although political protests can be violent, they can lead to stronger political parties and more responsive policies.

"Many of these recent protests in Latin America have led to changes in policies and the direction of the government," said Moises Arce, associate professor of political science. "It appears that in some cases, protests may ultimately be helpful for democracy. Some of the established parties may be taking some things for granted. Political protests become forms of street accountability. The change that we have seen after many of these protests is the creation of new parties that better represent the popular interests of society, and, therefore, serve as more effective communication channels for political discourse."

Arce studied the political activity and parties in 17 Latin American countries since 1978. He found that most protests were fueled by the creation of economic policies that favored the business sector. Arce said that although people often argue that protests are disruptive and should be channeled in a different way or that the time for protests has passed, the reality is that these protests are happening and they're not necessarily hurting democratic stability. More people in Latin America have become tolerant of protests, Arce said, and they've started to argue that maybe you need both parties and protests in a democracy.

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Mizzou ‘Flood Lab’ research paves the way for renewable crops of cottonwood biomass



Mizzou scientists are studying the feasibility of growing biomass crops on flood-prone farmland that no longer can be used for more traditional crops. That research is taking place at a unique “flood laboratory” at MU’s Horticulture and Agroforestry Research Center at New Franklin, Mo. Researchers can floodcontrolled swaths of the lab to find ideal flood tolerant trees, such as cottonwood. Horticulture and Agroforestry Research Center photo

Practical solution

New Franklin site first scientific test of flood tolerance

The Missouri River floods of 1993 and 1995 devastated thousands of acres of rich farmland with inches of sandy silt left behind after the water receded. Even if the sand could be removed to restore the soil to productivity, one heavy rainy season could ruin everything again.

Research at the flood laboratory at MU’s Horticulture and Agroforestry Research Center (HARC), at New Franklin, Mo., has found a practical solution to make such bottomlands economically productive again — cottonwood trees.

Cottonwoods are among the fastest growing trees in North America and mature in as little as two years. They can be sold for biomass, rough-cut lumber for home framing and high-quality lumber for cabinets. Their short and fine cellulose fibers also make them an excellent paper source. Extracts from their fragrant buds are used in perfumes and cosmetics.

A renewable resource just like traditional crops, some varieties of these trees thrive in boggy and sandy areas that can no longer sustain traditional crops.

The cottonwood research took place at a unique laboratory, one recognized as the most realistic flood simulator in the Midwest and possibly in America.

The flood lab at New Franklin, a part of the MU Center for Agroforestry, features a dozen two-foot-deep flood channels that can be individually flooded and drained to simulate a variety of flood conditions.

Built near the banks of Sulfur Creek, the laboratory's channels, each approximately 20-ft. wide by 300-ft. long, can be independently adjusted for water depth, standing or flowing water, and duration of flooding. Selected grasses, legumes and tree species are planted in the channels to determine their flood tolerance abilities.

Experiments at the flood lab also tested the survival and recovery rates of certain hardwood trees to floods, and what genetic changes to trees can make them more flood tolerant.

One test, completed late last year, confirmed that certain cottonwoods could withstand potential Missouri floods and be an economically viable crop that could be grown in flood prone areas.

The flood lab came from a brainstorming session after the '93 flood, recalled former MU agronomy Professor Bob McGraw. He and his colleagues envisioned an outdoor laboratory where researchers could screen Missouri plants for flood tolerance and offer farmers substitutes for traditional crops in almost useless bottomlands.

There was no such large-scale simulator available. The closest equivalent was a tub filled with soil in a greenhouse. That could work for individual plants and grasses, but a tub can't handle trees. Also, greenhouses don't replicate real field conditions.

The research center at New Franklin was a natural place for such a lab. The 660-acre farm hosts agroforestry research programs, experimental fruit and nut orchards, and forage shade tree trials. The farm is also the location of one of Missouri's oldest brick homes, the 1819 Thomas Hickman House.

It is one of 17 research farms of the Missouri Agricultural Experiment Station, a network of sites across the state where state-of-the-art research and demonstration programs bring Missouri land owners new information for reaching maximum income potential in each of the state's major soil and climate regions.

These facilities provide researchers and extension state specialists more than 14,000 acres of land and equipment for field experiments and demonstrations and provide information for industry and state and federal agencies.

H.E. "Gene" Garrett, forestry professor and former director of the Center for Agroforestry, came upon the idea of flood tolerant cottonwood trees as crops during a walk along a river bank during the '93 flood.

Some species of cottonwoods, he noticed, were thriving in the floodwaters while other trees had perished. Garrett and John Dwyer and Hank Stelzer, both associate forestry professors, used the new flood lab to test different genetic selections of cottonwoods to learn which are best suited to flood-prone areas.

Garrett pointed out that before the MU flood lab there was little scientific evidence on which trees were flood tolerant.

He and his team built the flood lab so that plants can be tested in flood conditions adjacent to identical control plants that receive the same sunlight and grow in the same soil conditions.

Data on tree flood tolerance, plus known information about commercial markets for cottonwoods, are being distributed via seminars, brochures and other methods to Missouri farmers who now have one more option for bottomland sites prone to flooding.

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MU development wins award

Despite a tough economic climate that has created difficult fundraising conditions, MU has managed to keep its fundraising performance constant throughout the economic downturns of 2008 and 2009. In recognition, MU was awarded the 2010 Overall Performance Award for fundraising from the Council for Advancement and Support of Education (CASE)

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Facing down the Jayhawks

The MU campus was practically deserted on the day after July 4, but there was plenty of Tiger hubbub in the online world. An organization called varsityoutreach.com, which tracks usage of college Facebook pages, ranked Mizzou among the top 10 universities in the country in the number of its Facebook fans.

As of July 5, MU's Facebook page had 90,328 fans. The University of Kansas edged out Mizzou with 90,716 fans. Louisiana State led the pack with 196,346 fans.

"We created our page in mid-June of 2009, and within a few months we were in the top 10 nationally," says Ryan Gavin, a senior information specialist with MU Web Communications who is one of the creators and administrators of the university's Facebook page. "At one point we climbed into the top five, but with some schools with significantly higher enrollments and alumni bases making a more concentrated effort, we've slipped back a few notches — still top 10, though."

MU's Facebook address is facebook.com/Mizzou.

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Yes, you can

Garden bounty

Home canning helps people reconnect with food

You can can nearly everything. From fruits and vegetables, to soups and broths, to meat, fish and poultry, canning is a way to preserve most foods, says Vera Massey, University of Missouri Extension nutrition and health education specialist.

Massey started canning with her mother and grandmother when she was a young child. "I would check the canning jars for cracks," she says. Today Massey passes on the knowledge and techniques of home food preservation once common in American homes, and after 36 years at MU Extension, Massey says canning is seeing a surge in popularity.

"There is a lot to know about food preservation," Massey says. "Freezing and drying are the simplest, but canning has its advantages." Canning doesn't require power after the process is complete, unlike freezing, and many people enjoy the unique taste and texture of canned foods. The canning process preserves food by removing oxygen, destroying enzymes that cause deterioration, preventing growth of bacteria, yeast and molds, and forming a vacuum seal.

There are only two safe ways of canning, depending on the type of food being canned. A pressure canner is used for low-acid foods (vegetables, meats, poultry and fish) and a boiling-water bath canner for high-acid foods (fruits, jams and pickles).

Botulism, a deadly type of food poisoning, is a serious concern for the home canner. Clostridium botulinum bacteria are the main reason why low-acid foods must be pressure canned to be safe. Clostridium botulinum is found in soil and if not destroyed during the canning process, can produce a deadly toxin. The two primary conditions that favor its growth are low acidity and absence of air (such as a sealed canning jar). Properly operated, a pressure canner reaches 240 degrees Fahrenheit, destroying the Clostridium botulinum spores. But if the food isn't properly processed, a breeding ground for botulism is created. One milligram of botulism toxin can kill 655 tons of mice. Massey isn't sure what 655 tons of dead mice look like, and she doesn't want to find out.

High-acid foods are canned with a boiling-water bath canner because they contain enough acid (pH of 4.6 or less) so the Clostridium botulinum spores will not germinate and produce the deadly toxin. A simple stockpot with a lid will work as a boiling-water bath canner, as long as it's deep enough to allow for at least 1 inch of briskly boiling water to cover the jars. Massey says to only use tested recipes with a known pH. Because tomatoes have pH values that fall close to 4.6, you need to take precautions to can them safely. Be sure to add acid to your home canned tomatoes (either citric acid or lemon juice), whether they will be processed in a boiling water bath or pressure canner. "Canning isn't cooking; follow the recipe," Massey says.

Massey recommends a trial run without food the first time you use a pressure canner. "It's going to make sounds, learn what they are and get used to them," she says. The trial run will also let you find the appropriate burner settings on your stove. It should be noted that most flattop stoves are not designed for use with a pressure canner. Also, be sure to test the accuracy of the dial gauge on your pressure canner before use each year. This can be done at the Boone County Extension Center. While processing, a constant pressure and temperature are necessary. If at anytime your pressure drops below the necessary level, you must start the processing time over. "I always err on the side of over processing," Massey says.

She prefers a wide-mouth jar because they are easier to fill and get products out of. Initial costs to start canning are \$80 for a pressure canner and \$25 for a boiling-water bath canner. Jars range in price, but Massey says that if they are taken care of, jars can last for years. Be sure to use two-piece lids for sealing the jars to allow the air to escape from the jar during the canning process. The flat metal disc with the sealing compound around the outer edge is used only once, but the screw band can be used over and over again, unless it rusts or is bent. Other necessary canning equipment is a rack to keep the jars from touching the bottom of the pan, a funnel to fill the jars and a jar lifter to remove the jars from the canner.

Massey teaches multiple classes on freezing, drying and canning techniques every year. She can be reached at the Boone County Extension Center and welcomes questions. If you plan on taking a class, register quickly; Massey says the last three years classes have been full.

The National Center for Home Food Preservation, located at the University of Georgia, is the leader in home food preservation research. She recommends visiting their website — uga.edu/nchfp — to see all it has to offer.

Massey feels the rise in the popularity of canning is related to the sustainable, local food movement. “It’s reconnecting with food and gardening,” she says. “Canning is something families can do together. It’s a lot of work, but it’s also fun.”

— *Josh Chittum*

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The art and science of MU staff members

The Arts and Science Staff Network recently announced its winners for the Arts and Science Staff Appreciation Awards. The awards were presented during the staff network's annual luncheon held May 19 at the Memorial Union.

The award winner this year was Kristy Crim, administrative associate I from the Art Department. The award includes an inscribed plaque, a check for \$250.00 and season passes to MU's Summer Repertory Theatre.

The Arts and Science Staff Network raised funds for two awards to the finalists: Melanie Irish, administrative assistant with Psychological Sciences and Candace Sall, associate curator from Anthropology. They both received a framed certificate; season passes to MU's Summer Repertory Theatre and a \$100 Visa gift card.

Sheila Akers (Economics); Jessie Becker (English); Judy Dooley (Statistics); Debbie Friedrich (Sociology); Rudy Idle (Military Science); Nancy Taube (History) and Victoria Thorp (English) received honorable mention certificates.

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