



**MU News Bureau**

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(The AAU Science News Website)

## [These hormones may make breast cancer act like stem cells](#)

Posted by [Jeff Sossamon-U. Missouri](#) July 17th, 2017

**Generated from News Bureau press release: [Fighting Cancer: Natural and Synthetic Progestin Therapies in Menopausal Women Help Breast Cancer Grow, Metastasize](#)**

New research links natural and synthetic progestins and the production of specialized cancer cells that act like stem cells in the body.

The findings could help scientists target these rare cells that proliferate in breast cancers and metastasize elsewhere, and may help clinicians identify immunotherapies to combat the spread of the disease.

Hormone replacement therapies—medications containing female hormones that substitute those no longer produced by the body—are often prescribed to reduce the effects of menopausal symptoms in women. Previous research has indicated that women who take hormone replacement therapies have a higher incidence of breast cancer.

**“In previous studies, we have shown that both natural and synthetic progestins accelerate the development of breast cancer and increase their metastasis to lymph nodes,” says Salman Hyder, a professor of biomedical sciences in the College of Veterinary Medicine and the Dalton Cardiovascular Research Center at the University of Missouri.**

“Our laboratory is committed to identifying the cell mechanisms that bring about increased breast cancer risks. Recently, our research focused on special cells—which are called ‘cancer stem cell-like cells’—that induce aggressive tumor growth, metastasis, and cancer recurrence.”

In a series of tests, the team used hormone-responsive human breast cancer cells to examine the effects of progestin on the cell markers typically found in breast cancers. Both natural and synthetic progestins significantly increased protein expression of CD44, a molecule involved in cell proliferation, cell communication, and migration.

Additionally, the presence of progestins caused these components to behave like cancer stem cell-like cells.

These rare cells are a small population of cells that—acting like normal stem cells—are self-renewing, create identical copies of themselves, and proliferate exponentially. Further testing showed that the rare subset of cancer cells actually was enriched by progestin.

“The findings show that exposure to natural and synthetic progestins leads to the development of these cancer stem-cell like cells,” Hyder says.

“These cells greatly increase the likelihood of resistance to therapies and the risk for metastasis. Our findings also suggest that clinicians may be able to combat the progestin-dependent tumor growth through immunotherapy.”

The College of Veterinary Medicine Committee on Research and the Ellis Fischel Cancer Center at the University of Missouri provided funding for the research. The content is solely the responsibility of the authors and does not necessarily represent the official views of the funding agencies.

# MISSOURIAN

## **\$10 million medical research institute closed by MU**

[EDWARD MCKINLEY](#) 13 hrs ago

**COLUMBIA — The MU International Institute of Nano and Molecular Medicine was closed June 30 as part of the UM System's cost-cutting measures.**

**The institute, at 1514 Research Park Drive off Providence Road, has been on campus since 2009. The decision to close the institute was made last month, MU spokesman Christian Basi wrote in an email.**

MU broke ground on the \$10 million institute in 2008. The future of the building is still to be determined, but it is likely to be used as a research facility, Basi wrote.

Next semester, teams studying biomedical innovations and disease therapeutics will be in the building, Basi wrote.

The closure will affect 17 full and part-time employees through a combination of layoffs and contract non-renewals, Basi said. MU expects to save about \$1.5 million annually.

Reasons for the institute's closure included its substantial operating expenses, as well as the lack of grant funding it has received in recent years, Basi wrote.

Frederick Hawthorne, recipient of the prestigious National Medal of Science, for his work on the element boron, had been the director since 2008.

He was given the medal in 2012 by President Barack Obama and is the only MU researcher to have ever received the award, [according to earlier Missouriian reporting](#).

The institute studied nanotechnology and how to apply it to fight diseases. Nanotechnology is the manipulating of matter on a tiny scale, less than 100 nanometers. A nanometer is one-billionth of a meter or .000000001 meter.

Hawthorne used the technology to manipulate the element boron in an attempt to combat cancer, arthritis and other illnesses.

The [institute's webpage](#) describes it as "the strongest research facility for the development of boron neutron capture therapy of cancer in the world."

Hawthorne was lured to MU from UCLA, where he had worked since 1969, in part because of the institute and the reactor it housed, which is among the best in the world for academic research, [according to earlier Missouriian reporting](#).

He is still an employee of MU at this time, though his ongoing role is unclear.

## **Medical group readies complaint against MU over use of live pigs**

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By Tess Vrbin

**The Physicians Committee for Responsible Medicine will file a federal complaint Thursday against the University of Missouri School of Medicine, claiming that the school's use of live animals for emergency medicine residency training is illegal.**

In the complaint, which the committee emailed to the Tribune on Friday, the national not-for-profit organization of 12,000 physicians asserts that the training program does not meet the requirements of the Animal Welfare Act of 1966. Emergency residents practice several medical procedures on live pigs, and “this animal use is at odds with the current standards of practice in emergency medicine training,” the committee said in the complaint.

The committee conducted a survey of 168 emergency medicine programs nationwide and found that 150 of them, or 89 percent, did not use animals to train residents. Four of those 150 programs are in Missouri, including the University of Missouri-Kansas City, which is part of the UM System along with the Columbia campus. In the complaint, the committee said these 150 programs use only human-based simulation to practice the procedures that MU's residents practice on pigs. Because the MU School of Medicine uses live animals despite the existence of alternative methods and has not provided “objective evidence to support” doing so, the school is breaking the law, the organization said in the complaint.

However, Foundation for Biomedical Research President Matthew Bailey said in an email that nationwide, doctors do not have a general consensus that simulation can replace the use of animals in physician training.

“While simulators have become increasingly advanced in recent years, and make good adjuncts to training, many doctors do not agree that they provide an adequate level of training before operating on live people,” Bailey said. “They simply aren't a full replacement in every case, yet.”

Human-based simulators “are not yet capable of replicating the human condition” in the case of some injuries, Bailey said. He gave the example of traumatic injuries that members of the military might suffer in combat.

The Association of American Medical Colleges on its website says that the role of live animals in research is “irreplaceable” and that animals are “vital in the medical education continuum.”

The Physicians Committee for Responsible Medicine attributes its information about MU's emergency medicine training program from a protocol document the committee obtained.

According to the document, trainees cut into and open the throats and chests of the live pigs in order to insert needles and tubes and repair an injury to the pericardium, a sac surrounding the heart. The trainees continue the procedures even if the pig dies in the process, but if it survives, they kill it before they perform the final procedure.

The committee will send the complaint to the Animal and Plant Health Inspection Service's Animal Care Unit, which is the division of the U.S. Department of Agriculture responsible for enforcing the Animal Welfare Act. The complaint asks APHIS to investigate MU's medical school and enforce penalties for what the committee sees as breaches of federal law.

The law requires research leaders to conduct thorough searches for alternatives, and if they find none, they must provide a written explanation of how they came to that conclusion, and that researchers using live animals must limit the pain and discomfort procedures cause the animal.

MU sent the Physicians Committee for Responsible Medicine and the Tribune a response to the complaint in which Jeff Henegar, the director of animal care quality assurance in the MU Office of Research, said the university disagrees with the claim that the emergency medical residency program can use human-based simulation for all of the training it provides. The medical school's Shelden Clinical Simulation Center has mannequins that "breathe, have a pulse and eyes that dilate, and can react to various drugs," according to the school's website. Henegar wrote in the response that the school uses simulation for the majority of its emergency medicine training.

"In the extremely rare instances (approximately six animals per year) when we need to train emergency medicine resident physicians on life-saving measures that are not adequately replicated through simulation, we use humane and strict procedures and protocols that are reviewed by the University's Animal Care and Use Committee," Henegar wrote.

Dr. John Pippin, the Physicians Committee for Responsible Medicine director of academic affairs, said he did not think the response properly addressed the committee's concerns. He disputed Henegar's statement that the training program treats the pigs humanely. The animals "suffer the anxiety and trauma" of being taken captive, transported, held down, anesthetized and "mutilated and killed," Pippin said.

Additionally, practicing on pigs is a "substandard form of training" for emergency medical residents because of the anatomical differences between pigs and humans, Pippin said.

Bailey said it is preferable for physicians to practice on living beings.

"Speaking personally, I would prefer that my surgeon has had at least some experience working with live tissue before I entrusted my life to them under anesthesia, and I think most people would agree with that notion," Bailey said.

Later in their training, MU emergency medical residents practice the same procedures on humans under supervision, according to the protocol.

The Physicians Committee for Responsible Medicine is not the first group to sue MU related to its use of animals in research and training. The university is being sued by Animal Rescue Media Education over a request for documents relating to 179 dogs and cats used in research. The UM

System records office demanded \$82,222.23 to locate and copy the records for the organization's Beagle Freedom Project, which has targeted MU over a research project that included blinding and euthanizing beagles.



## **Former university surgeon pleads guilty to harassment**

By Sarah Bono

COLUMBIA, Mo. - **A former University of Missouri Hospital surgeon has pleaded guilty to harassment charges.**

Dr. Gregory McClain was charged with two counts of harassment after he allegedly had others make harassing phone calls to former coworkers in 2014.

Two victims told police a deep voice, who identified himself as "The Gorilla", threatened them to "back off" and that bad things would happen to them if they didn't listen.

Police said one of the victims made a sexual harassment complaint.

McClain previously told ABC 17 News he was innocent of the accusations.

"They may be victims," McClain said in April 2016, "but they're not my victims. I'm a family man, a God-fearing man. The things I've been accused of don't make sense."

McClain is to be sentenced Wednesday.

A hearing for Jimmy Thomas, the man charged with two counts of aggravated stalking in the case, was delayed in court on Monday.



## UM System Board of Curators to Discuss Enrollment Strategies

Watch the story: <http://mms.tveyes.com/PlaybackPortal.aspx?SavedEditID=7247eba0-7ef8-44d7-a3ee-58ddf0522664>



## Students Can Earn In-State Tuition at MU

Watch the story: <http://mms.tveyes.com/PlaybackPortal.aspx?SavedEditID=336cae29-5506-44b0-b637-53d5a542a78e>



## **Mizzou women's soccer team helps prepare new veterans housing complex**

By: Lindsay Hornecker

**COLUMBIA- The Mizzou's women's soccer team helped move new mattresses and bed frames into Welcome Home's new facility on Monday.**

Welcome Home is a Columbia-based organization which helps homeless veterans by putting a roof over their head and food in their bellies.

“We serve homeless veterans, exclusively homeless veterans, so we’ve been operating out of a little facility at 1206 Range Line that has 11 beds, we’ve been sleeping 13 in that,” said Timothy Rich, executive director for Welcome Home.

On Monday, the Mizzou women’s soccer team volunteered for their first time at Welcome Home.

“We do like to push community service on our team a lot, we do lots of hours every single semester,” said Kristen Rivers, a member of the Mizzou women’s soccer team.

The team hopes to continue their relationship with Welcome Home in the future.

“A lot of girls get excited about, 'Hey I really liked working with these people or for this certain cause,' so I think it’s just easy and natural just to move on from their you know and keep the train rolling and see what else we can do for these awesome people,” said Rivers.

The new facility will help triple the number of veterans staying there, and will be able to accommodate those in wheelchairs, females and veterans with families.

“We’ve got 32 rooms, we’ve got 34 beds, we will have a dining facility, a commercial kitchen, community room, we’ve got a computer lounge so that folks can get their benefits, but we’ll also

be doing some computer classes, and then all of our administrative and service offices are here, 6 or 7 veteran service staff who do nothing but work with veterans to get them back on their feet," said Rich.

The expansion of the new facility follows a need for a bigger space to help with the increasing number of veterans, with more to come.

"We expect more and more veterans to be coming back over the next 10 years, and the issues that affect homeless veterans have to do with brain injury, with traumatic stress, with post traumatic stress disorder, all of those things complicate the veterans lives even though they are wounds that are not seen," Rich said.



## [Man gets 18 years for MU campus rapes](#)

By: Lucas Geisler

COLUMBIA, Mo. - [A man was sentenced to 18 years in prison for two sexual assaults he admitted to committing on the University of Missouri campus.](#)

Zachery Jones received the punishment from Judge Kevin Crane on Monday in the Boone County court. Jones pleaded guilty to one count of rape and another count of attempted rape.

The judge sentenced him to exactly what prosecutor Jessica Caldera recommended - five years on the attempted rape charge and 13 years on the rape charge to run consecutively. Jones will need to serve 85 percent of the 13-year sentence before he is eligible for parole, Caldera told ABC 17 News.

[University police arrested Jones](#) in March 2016 for the two early-morning attacks. Police claim Jones first threw a woman to the ground near Mumford Hall at Hitt Street and University Avenue. The victim fought him off, police said, and call 911. The second attack happened later that morning. The woman led Jones back to her residence hall, where she escaped inside. Surveillance footage from outside the hall helped police find Jones.

The latter survivor, who lives out of state, submitted an impact statement to Crane for the hearing. The two-page statement describes the assault, and its effect on her. She said Mizzou made her feel safe as she walked on campus around 5 a.m. on March 5.

"No amount of time that Zachery Jones spends in a jail cell will change how I feel about what he did to me," the statement reads. "One year or one hundred years in prison, I will still be a victim of rape, and I will have to live with that for the rest of my life. What Zachery Jones did to me will always be a part of my life, but I will never let it define who I am or what I'm worth."

The woman was walking back to her residence hall from a fraternity party, she said, a walk that usually takes seven to ten minutes. Jones jumped out of the bushes outside of the Student Center, just 100 feet from her residence hall, and slammed her into the concrete.

The assault led her to feelings of suicide, and fears that she may always need anti-depressants.

"I can only pray he never does this to anyone else," she wrote. "I want my story to be heard, and I want to do everything in my power to reduce the cases of rape and sexually violent crimes on college campuses. This is every girls' worst fear."

Neither Jones nor his lawyer, assistant public defender Jeremy Pilkington, made an argument in court Monday.

Caldera told ABC 17 News that the survivor's walking alone that morning did not give Jones the right to attack her.

"Basically, I often hear victims and/or their family members talk about what they should've done differently," Caldera said. "Our society's instinct to blame the victim often creates another layer of victimization. While it may be human nature to wish we'd made different decisions in hindsight, I want people to know that even when people--in particular, college women--do everything right, someone like Zachery Jones can still make them a victim.

Caldera also credited the woman for getting Jones back to the residence hall, where surveillance cameras were able to capture his image.

"Her quick-thinking actions helped law enforcement apprehend him very quickly, which protected other women," Caldera said.



## No Damage Estimate Yet for Lewis Hall Flood

Watch the story: <http://mms.tveyes.com/PlaybackPortal.aspx?SavedEditID=e1dc70e9-06af-4403-91da-37d55263d50a>