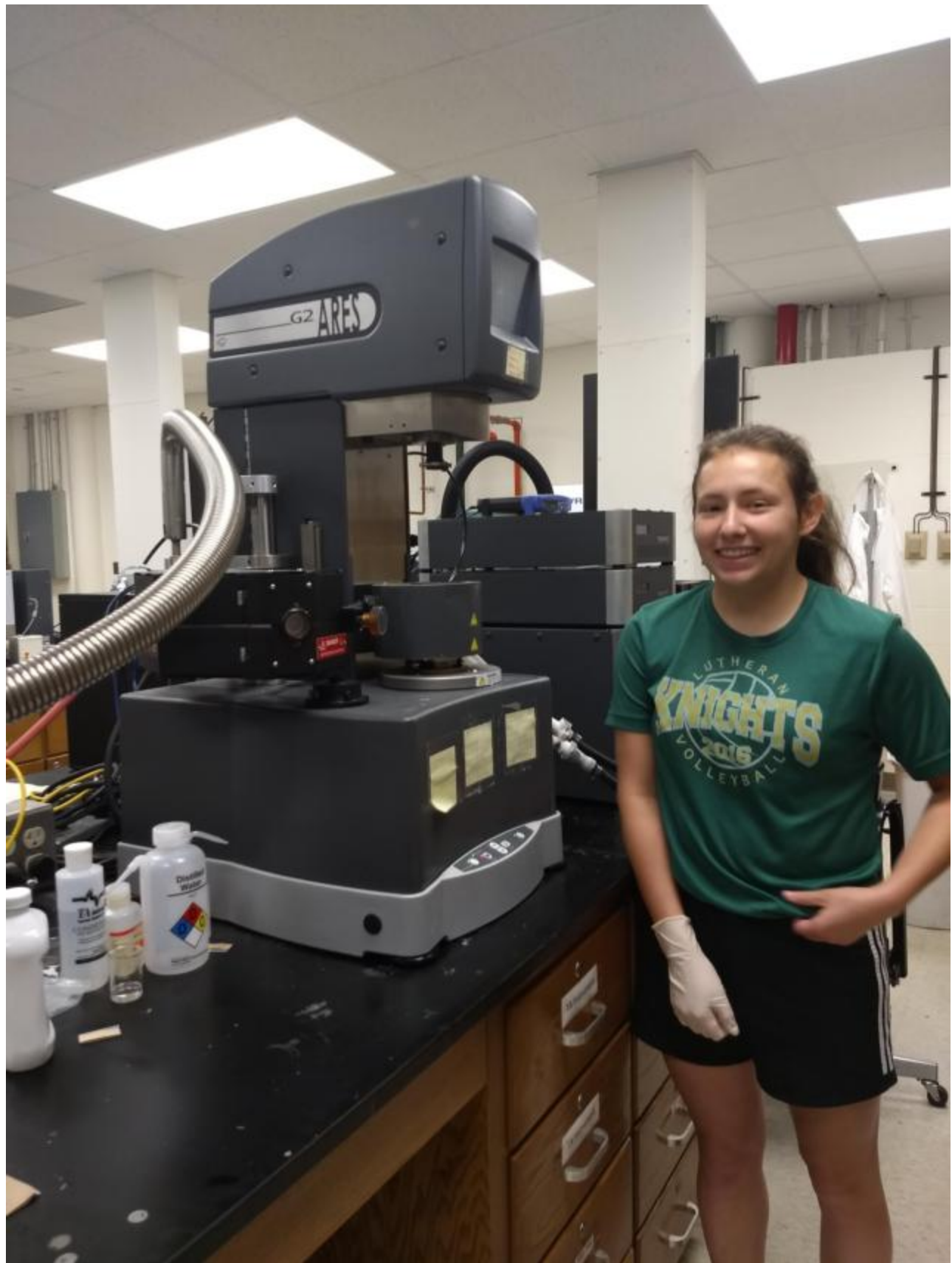


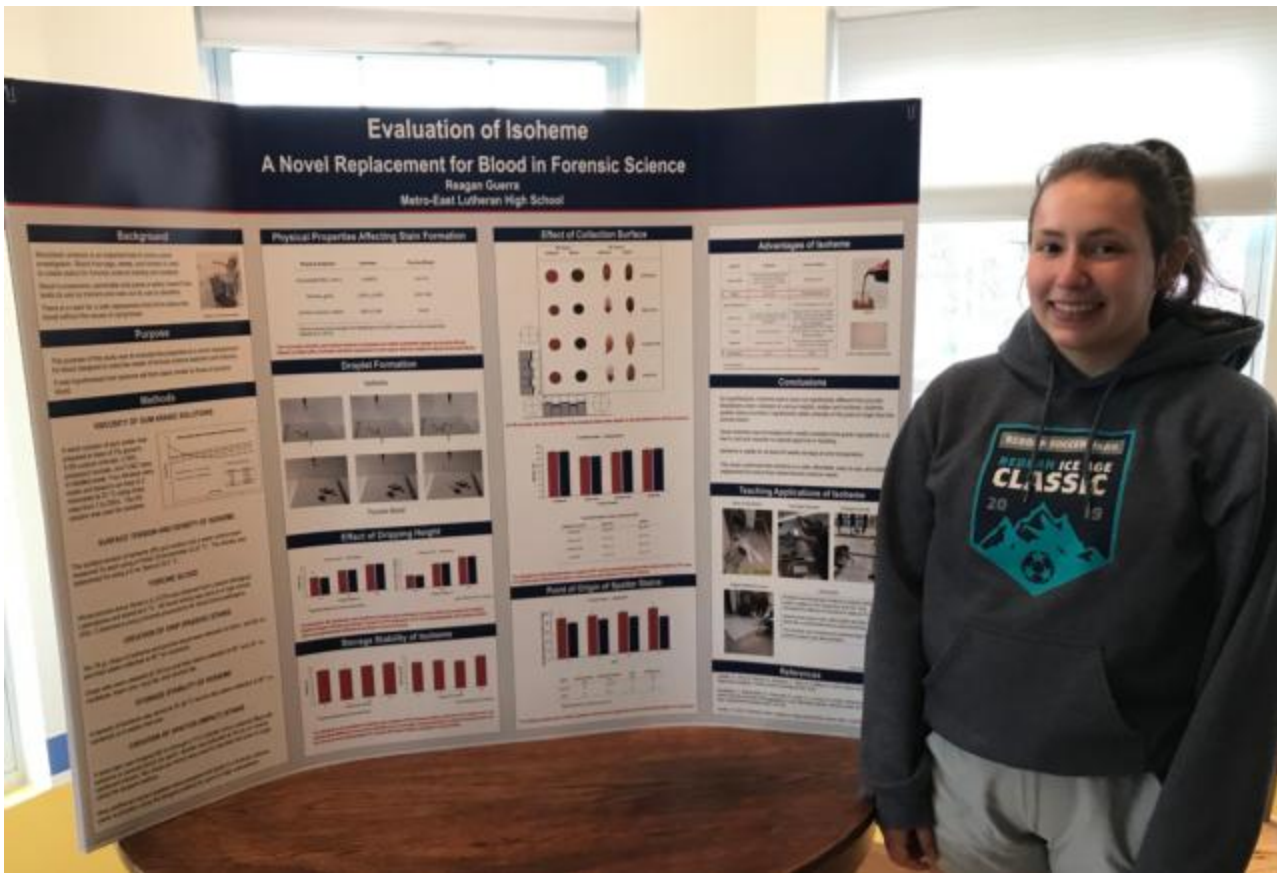


Metro-East Lutheran High School Senior Earns National Recognition for Forensic Science Research

by Angela Mueller
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EDWARDSVILLE – When Reagan Guerra was in second grade, she asked her grandmother if she would help her with her very first science fair project.



Now 10 years – and just as many science-fair projects later – Guerra is earning national accolades for her scientific research.

Guerra, who is a senior at Metro-East Lutheran High School (MELHS), has developed a product that can be used as a substitute for blood in training for crime scene investigations. On Friday, Guerra learned that her work on this product, and the extensive research behind it, earned second place in the chemistry division at the National Junior Science and Humanities Symposium, an award that comes with an \$8,000 scholarship. Only the top three students in eight divisions, for a total of just 24 nationwide, are honored each year through this program.

The national success follows a series of wins in state and local competitions. Guerra's research took second place at the Illinois Junior Science and Humanities Symposium, winning her a \$1,500 scholarship and the opportunity to present her research at the national event. The national symposium originally was scheduled to be held in Norfolk, Va., at the end of April, but due to shelter-in-place restrictions related to the coronavirus pandemic, Guerra presented her research virtually via a video presentation and Q&A session with judges.

In addition, Guerra took home first-place awards in both the project and the research paper divisions at Southern Illinois University Edwardsville's recent Science and Engineering Research Challenge, which also had to be held virtually. She would have gone on to compete in the national research challenge, which was to be held in Anaheim, California, but the event was canceled due to the ongoing pandemic. Like many other high school seniors, Guerra is dealing with missing what would have been milestone opportunities and events due to the impact of the coronavirus.

"This year I would have gone to Virginia and California, so it's kind of sad to have to miss out on two trips like that," Guerra said. "But I'm glad I still got to compete virtually for the Virginia event."

The product Guerra developed, which she has named Isoheme, can be used to recreate a crime scene where the patterns of the blood spatters are used to determine things such as how tall a suspect might be or where they might have been standing when blood was shed.

"Reagan's product has the feel of blood and drops like blood and spatters like blood," said Deb Wudtke, a biology teacher at MELHS. "It was easy to use, dried quickly, and was not sticky like a commercial product used previously."

Historically, actual human blood, and later animal blood, was used in crime scene recreations.

"There are a lot of issues with that," said Bev Friend, Guerra's grandmother, and a food scientist. "Blood is expensive, poses a safety hazard, and storage is an issue. It doesn't

last very long. Other blood substitute products exist, but researchers have shown that they can't be used for forensic training because their physical properties are not similar enough to those of blood.

The idea behind Reagan's research was to address these issues by coming up with an affordable, stable, safe substitute made with food-grade ingredients that acts just like blood."

Guerra started working on developing the product during her sophomore year, trying different formulas then measuring their performance against actual blood. Using Wudtke's biology lab at MELHS, Guerra suited up in a HAZMAT suit and tested her product against pig's blood. She also traveled to both Southern Illinois University Carbondale and the University of Illinois to use their advanced lab equipment to test properties such as the surface tension and viscosity of her product as compared to real blood.

Wudtke has used Guerra's product in crime scene investigation projects in her forensic science class at MELHS for the past two years. In the forensic science class, which Guerra took her junior year, students discover how to apply the science that they've learned previously in their chemistry and biology classes. They look at glass fracture patterns to determine a bullet's direction and speed when traveling through the glass, then study blood typing and DNA evidence. And, of course, they learn how to calculate valuable crime scene information using blood spatter patterns.

"It's an application class," Wudtke said. "It's learning to be observant enough to take the evidence and use it to draw conclusions."

Wudtke previously spent 11 years at the St. Louis Science Center, where she was the Life Science Gallery Leader. While at the Science Center, she developed a two-hour crime scene program for visiting students. "That's where I learned to love the subject," Wudtke said, adding that the subject also has been well-received among her students at MELHS.

"Humans generally are curious and want to figure things out," Wudtke said. "I think that's why Reagan has enjoyed the projects she's done. She's enjoyed getting some of the recognition she's received, but that's not why she does it. She's just curious."

Guerra, who plans to study chemistry at Concordia University Chicago next year, said she has learned much through the years by participating in science and research competitions and would encourage other students to give it a try.

“I’ve had to do a lot of presentations. I’ve written a lot of papers, so I’ve had to learn a lot of different skills,” Guerra said. “It’s a lot of work, but it’s good to learn to have motivation.”

Metro-East Lutheran High School (MELHS) has been providing academic excellence in a Christ-centered environment for more than 40 years. **For more information about Metro-East Lutheran High School** go to www.melhs.org.

