

# GRADUATE AG RESEARCH SPOTLIGHT



## Jessica Zuponic

*"It helps to have a diverse group of people in the lab. I'm an engineer, but several other disciplines are represented. We support each other technically."*

*Jessica Zuponic, M.S./Ph.D. student, Agricultural and Biological Engineering*

**THE STUDENT:** Jessica Zuponic grew up in the Cleveland suburb of Solon, Ohio. She was academically strong in math and science and enjoyed chemistry and cooking—the kind of kid who, during “Take Your Daughter to Work Day,” became intrigued by a machine in the lobby of her engineer-father’s employer that sorted jelly beans by color. As a Purdue undergraduate, she discovered biological/food process engineering “a good mix of the things I enjoyed as hobbies.” A college internship with Frito-Lay led to a full-time job with the company in Plano, Texas after graduation. Zuponic thrived in research and development for three years but also quietly compared her work on potato chips to what researchers with doctorates worked on in the same process lab. “I wanted more of a challenge in terms of developing cutting-edge technology,” she explains. She searched out graduate programs and read published papers, and determined that the biological engineering lab of Assistant Professor Meng Deng offered “an awesome combination of biomaterials engineering, cellular engineering, and basic principles I learned in the food industry.” She arrived back in West Lafayette in fall 2015 with communication and teamwork skills honed by her professional experience, she says.

**THE RESEARCH:** Zuponic’s research focuses on developing a “bone-inducing” polymer composite replacement for a bone graft. In a regeneration process to heal a bone defect, this composite would trigger the body’s stem cells to form new bone. In contrast to industry product development, her work at Purdue

is more focused on longer-term goals by integrating recent advances in bioengineering, materials science, and cell biology. “At Frito, you could work on a product for a year or so and see it on a store shelf,” she says. “Now I can work on longer-term, newer, exciting technologies. These projects have their own and different kinds of rewards—that a polymer composite replacement for a bone graft takes longer to develop, but is extremely impactful for someone else’s life.”

**ADVISORY AND CAMPUSWIDE SUPPORT:** Deng’s support has been crucial in her first year of graduate study, Zuponic says. “He helps us technically and ensures we each have a good mastering of the basic principles behind what we’re doing.” She also benefits from complementary work in other areas at Purdue: “There are a lot of analytical tools that we can be trained to utilize right on the campus. Discovery Park has many types of resources close by.”

**FUTURE PLANS:** Zuponic has completed the coursework for a master’s degree—including a particularly helpful Polymeric Biomaterials class taught by Deng—and expects to finish a thesis within the next year. Her doctoral research could take an additional two to three years, and she hopes to explore an academic career or entrepreneurship as future options. “In her spare time, she is a regular runner. “I try to stay healthy because it keeps me sharp,” she says. “Running helps me think clearer. Beyond that I don’t have too much spare time, but I do enjoy going to rock concerts or festivals in the area.”