

# Heather Temple, English

Year in School: Sophomore  
Faculty Mentor: Dr. Zhanyuan Zhang, Agronomy  
Funding Source: EXPRESS Program funded by the National Institutes of Health

## Importance of gene expression in corn

Corn is the nation's top crop, and Missouri ranks tenth overall in the production of corn. In Missouri, corn is the second largest crop. Missouri produces nearly 300 million bushels of corn annually. One bushel of corn makes 32 pounds of starch or 33 pounds of sweetener or 2.7 gallons of ethanol fuel, 11.4 pounds of gluten feed, 1.6 pounds of corn oil, and 3 pounds gluten meal. An average supermarket contains over 400 products containing corn. Some products that contain corn that may surprise a person include fireworks, toothpaste, aspirin, glue, batteries, crayons, shoe polish, marshmallows, paint, ethanol fuel, and licorice. With the world population on the rise, producing enough corn to keep pace with the demand is an ever-greater challenge. The goal of agronomy is to design crops and cultural practices that will optimize productivity in an efficient, sustainable, and environmentally safe manner. It uses state-of-the-art transformation techniques for corn to enhance the introduction of foreign genes into the crop. Plant genes produce certain proteins that are functional and responsible for plant growth and production. A gene (foreign or bacterial) is introduced to the corn and the gene then determines the proteins. They are then modified by the plant and utilize production of plants. In my research I helped transform the corn embryos from different stages to help optimize plant growth. After the gene was introduced to the corn I would move the embryos to different media types to produce better results. I would then cluster the mature embryos together and they would move to a dark incubator. After three to four weeks I would pick the best ones out and put them into a regeneration media that went into a sunlight simulated incubator. Two weeks later plants would start to sprout and then would be moved to root media in test tubes. After the plants showed strong roots they were put into soil and finally the greenhouse. The plants would grow to full size and then harvested to test the results.