

New professor focuses on crop production in rapidly changing world

Dr. Sarah Anderson, newest rising star in genetics, development and cell biology (GDCB), is well aware that bad weather can cause huge yield losses for corn farmers in Iowa and across other corn-growing regions around the world. Her research is focused on improving crop resilience in unpredictable future climates.



Dr. Sarah Anderson

Anderson said, “By understanding how maize responds to stressful conditions, we can improve the ability of crops to survive and thrive in unpredictable weather. My lab focuses on understanding how genetic differences between varieties impact how genes are expressed.”

When asked about how her work will improve crop survivability, Anderson said, “Gene expression regulation is very complex, but subtle changes in levels of gene expression allow plants to respond to changes in their environment and provide them with the ability to withstand stressful conditions such as when unpredictable weather patterns occur.”

Jumping genes

A major source of genetic variation between varieties of maize comes from accumulation and deletions of transposable elements (TEs). TEs are unique because they can move to new places in the genome. Too much movement can cause harmful mutations as well as influence the expression patterns of nearby genes. The Anderson laboratory studies how the maize genome silences TEs to reduce the risks of movement during

seed development. By studying TE families that become expressed in response to temperature stress across different maize varieties, Anderson’s lab can identify which TEs can create coordinated expression responses of nearby genes. Her lab’s goal is to understand how differences in TE content among different maize varieties contribute to the variation seen in how plants respond to stressful environments.

When asked about the real world impact of her work, Anderson said, “Once we fully understand the factors controlling TE behavior, we can then use this understanding to create varieties that are more resilient to the stressful weather conditions we encounter here in Iowa and globally.”

Anderson received her bachelor’s degree in genetics from Iowa State University (ISU) prior to earning her Ph.D. in integrative genetics and genomics from the University of California, Davis. She joined the GDCB faculty in January 2020.

When asked about her new position and department environment, Anderson said, “Iowa State is a great university and an ideal place to work on maize. I’m very excited to become part of the GDCB faculty and work with world class colleagues.”

“Iowa State is a great university and an ideal place to work on maize. I’m very excited to become part of the GDCB faculty and work with world class colleagues.”

— Dr. Sarah Anderson
