Julie Meyer

Major: Agriculture
University: Truman State University
Faculty Mentor: Dr. James Birchler
Mentor Department: Biological Sciences
Funded by: NSF-REU Program in Biological Sciences & Biochemistry

Retension of knobs in chromosome tips in maize

Julie Meyer, Jonathan Lamb and James A. Birchler

Knobs are deeply staining chromosomal sites on maize chromosomes. Molecularly, they are composed of a 180 base pair repeat. Their positions on the chromosomes are variable but usually internal in maize. In relatives, the knobs are usually found on the tips of chromosomes. They have been observed for a long time, yet their function remains a mystery. Knobless maize lines do not appear to have knobs. I used fluorescence in situ hybridization (FISH) to test whether cryptic knob sequences exist at the chromosome tips in maize but have avoided normal detection. Long exposure time detects weak signals near the ends of most chromosomes and some cryptic internal sites. Knobless lines are ideal because they do not have the large knobs which can make such detection difficult, if not impossible. I found the Knobless Tama Flint and Knobless Wilbur Flint lines to have cryptic knobs on most chromosomes. *Zea diploperennis* exhibited knobs on every chromosome, usually at the tips. Thus, although knobs as usually detected in maize are internal, maize has cryptic knob sequences at the ends of most chromosomes in a similar situation as its relatives suggesting a conserved function at chromosome termini.