PBG 431 Plant Genetics recitation

Wheat chromosomes

Cytogenetics is an area of genetics related with the study of the chromosomes. Based on Mendel’s principles, the inheritance of any gene will deviate from Mendel’s laws if the gene is in a chromosome that is somehow altered. In some species, individual chromosomes can be targeted for sequencing.

Transposable elements are DNA that can move from directly (or via and RNA intermediate) from one position to another in the genome. Barbara McClintock discovered elements around 50 years ago in maize. Molecular genetics tools have brought a new level of sophistication to cytogenetics. Fluorescence *in situ* hybridization allows detection of specific sequences in the genome using labeled DNA sequences that are complementary to the biological sample.

1. Why are chromosome deletions easier to study in wheat (a polyploid) than in barley (a diploid)?
2. If a chromosome (or part of a chromosome) is absent from a wheat plant, how does this assist in mapping a gene that is on that chromosome (or part of a chromosome)?
3. How do transposable elements relate to the C-value paradox?