Hypothesis

1) Does gene expression at the level of the whole chromosome scale with DNA levels for aneuploid chromosomes?

If not, is it a significant difference?

Do different lines with the same aneuploid chromosome(s) have similar expression levels on that chromosome?

2) Are there certain genes that are up or down regulated in all aneuploid lines? (ESR?)

Which ones are on the aneuploid chromosome and which ones are elsewhere?

Are there certain genes shared between ALL lines that are up- or down-regulated, regardless of ploidy? (MA effects?)

Are there certain genes on euploid lines that are commonly up- or down-regulated? Are any of these different than the aneuploid lines?

3) What is the rate of aneuploidy? Is it different between GC and MA?

4) What are the fitness consequences of being aneuploid?

5) Are histone genes dosage compensated? Are any ESR genes up- or down-regulated?

Other DE genes:

What are they? Are there any housekeeping genes?

Analysis

t-test (or non-parametric equivalent) between expected gene expression level and average observed expression level

t-test on gene expression levels between different lines with the same aneuploid chromosome

\*also: use JMP to plot distribution of gene expression levels on aneuploid chromosome – should not be normally distributed

Using cuffdiff, compare the output files listing DE genes to one another

Only aneuploid lines >50%, >75%, >90%

Sort resulting file by chromosome

then do again using all of the lines

Also separate by experiment and sequencing time

Look up how to calculate this

Sam’s part

Cuffdiff

Do at same time as Hypothesis #2