

```

1 R
2
3 library(edgeR)
4
5 ### make CONTRASTs to calculate DE within each line
6 #####
7 my.contrast <- makeContrasts(A632 = A632.treated - A632.control,
8                             B73 = B73.treated - B73.control,
9                             B96 = B96.treated - B96.control,
10                            F7 = F7.treated - F7.control,
11                            H99 = H99.treated - H99.control,
12                            HP301 = HP301.treated - HP301.control,
13                            Mo17 = Mo17.treated - Mo17.control,
14                            W153R = W153R.treated - W153R.control,
15
16                            TREATvsCONTR = (A632.treated + B73.treated + B96.treated +
... F7.treated + H99.treated + HP301.treated + Mo17.treated + W153R.treated)-
17                            (A632.control + B73.control + B96.control + F7.control +
... H99.control + HP301.control + Mo17.control + W153R.control),
18
19                            RESISTvsSUSCEP = ((A632.treated + H99.treated +
... HP301.treated + W153R.treated) - (A632.control + H99.control + HP301.control +
... W153R.control)) -
20                            ((B73.treated + B96.treated + F7.treated + Mo17.treated) -
... (B73.control + B96.control + F7.control + Mo17.control)),
21
22                            levels=design)
23
24
25
26 ### BIO1 - conduct QL F-tests for the PATHOGEN EFFECT across lines

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27 #####
28 qlf <- glmQLFTest(fit, contrast = my.contrast[ , "TREATvsCONTR"])
29
30
31
32 ### BIO2 - conduct QL F-tests for the PATHOGEN EFFECT on each LINE
33 #####
34 ### Significant differential expression in each gene using the QL F-test
35 A632 <- glmQLFTest(fit, contrast = my.contrast[, "A632"])
36 B73 <- glmQLFTest(fit, contrast = my.contrast[, "B73"])
37 B96 <- glmQLFTest(fit, contrast = my.contrast[, "B96"])
38 F7 <- glmQLFTest(fit, contrast = my.contrast[, "F7"])
39 H99 <- glmQLFTest(fit, contrast = my.contrast[, "H99"])
40 HP301 <- glmQLFTest(fit, contrast = my.contrast[, "HP301"])
41 Mo17 <- glmQLFTest(fit, contrast = my.contrast[, "Mo17"])
42 W153R <- glmQLFTest(fit, contrast = my.contrast[, "W153R"])
43
44
45 ### BIOLOGICAL QUESTION 3 --> genes responsible for the RESISTANCE to the
... infection
46 ### 4 most resistant vs 4 most susceptible (or vs 2 most susceptible)
47 #####
... #####
48 ### find genes that are differentially expressed resistant vs susceptible lines
49 qlf <- glmQLFTest(fit, contrast = my.contrast[ , "RESISTvsSUSCEP"])
50

```