qpCR-Figures

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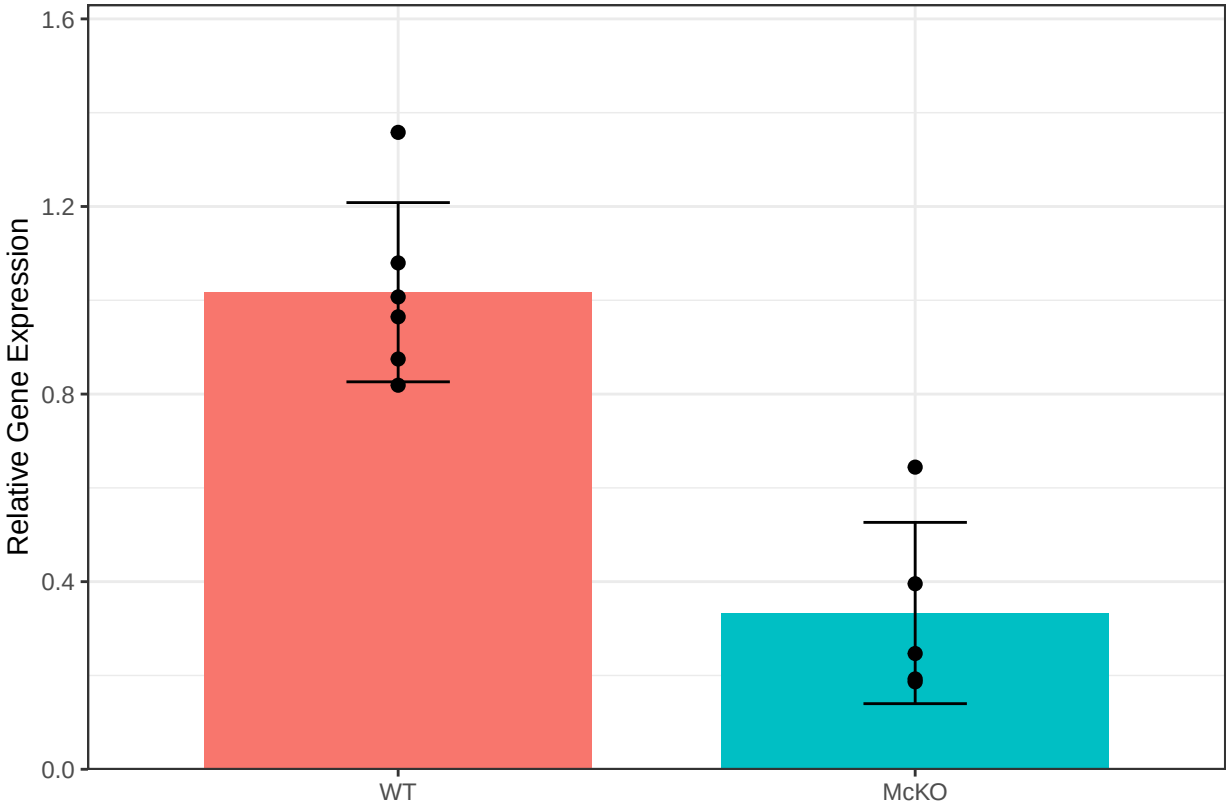
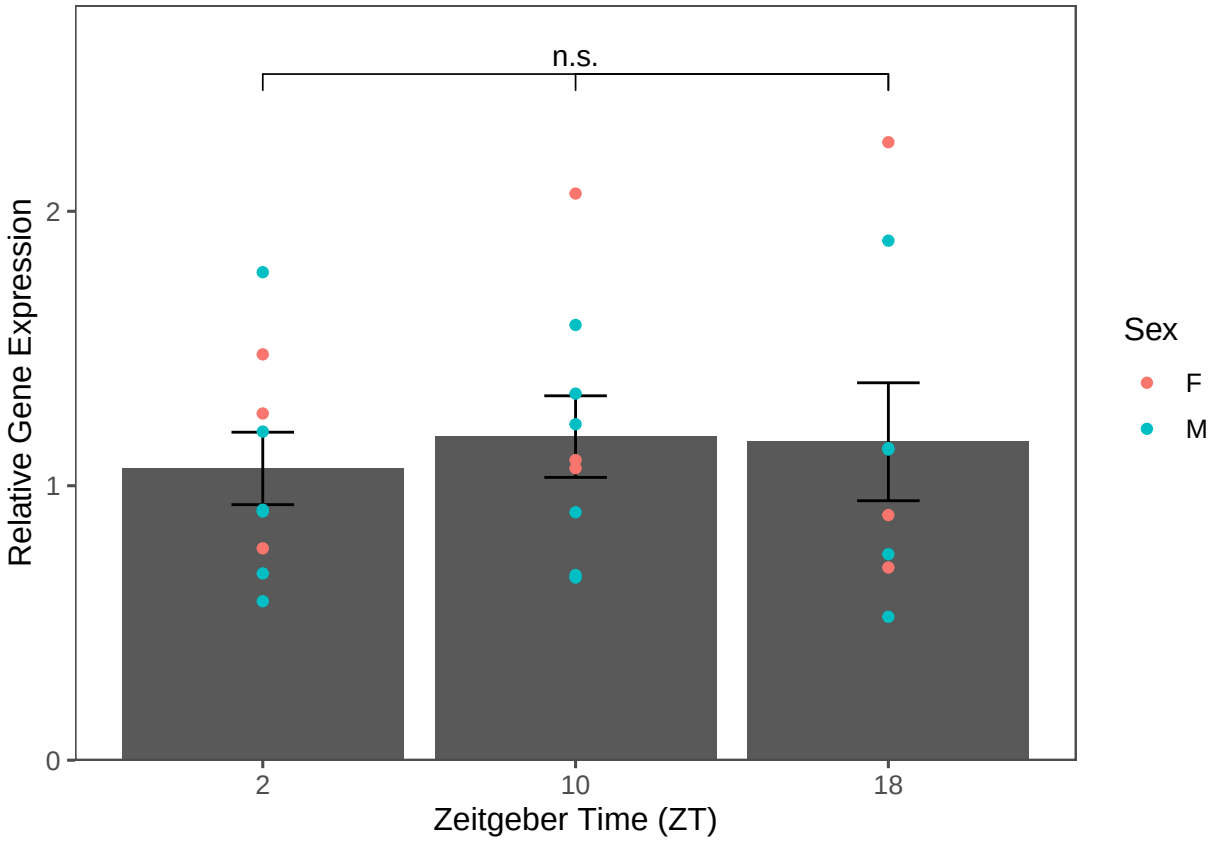
McKO validation

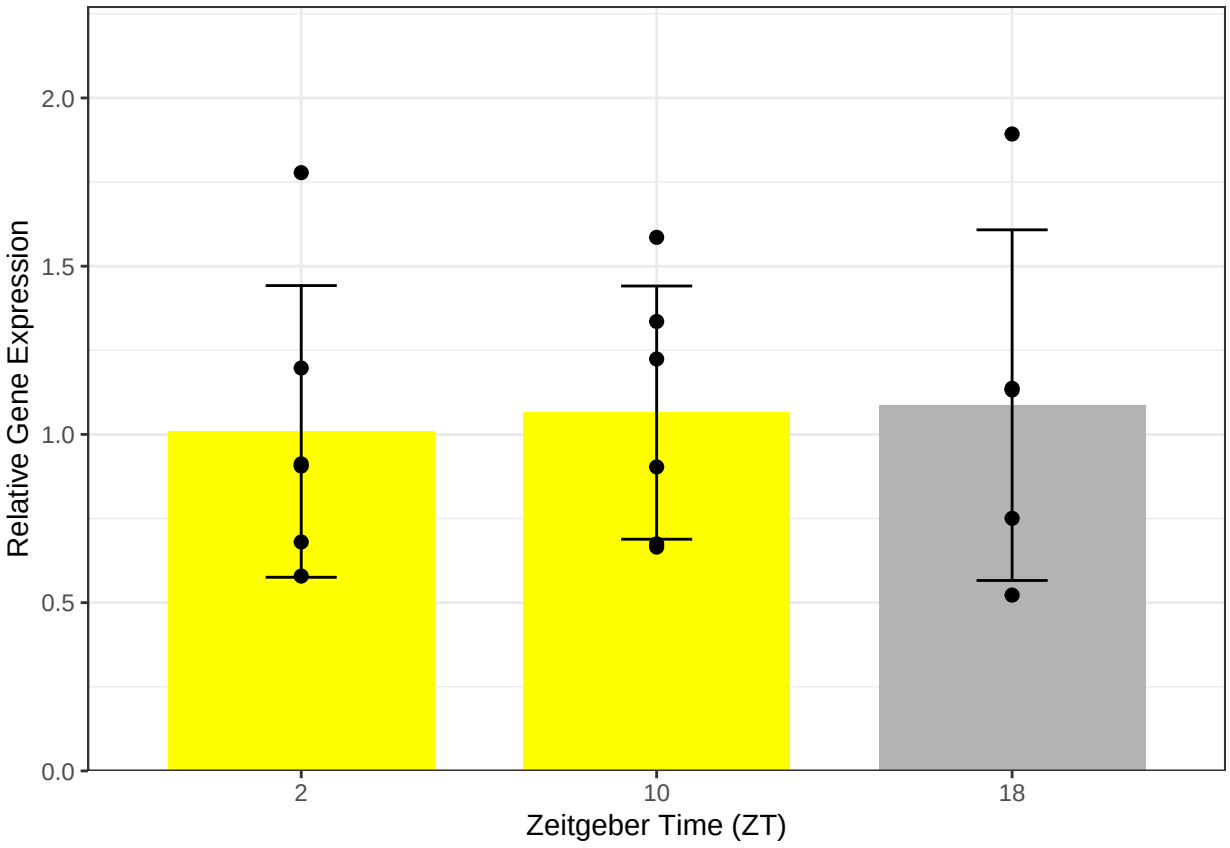



```
## # A tibble: 2 x 4
##   Genotype     n  mean    sd
##   <fct>    <int> <dbl> <dbl>
## 1 WT           6 1.02  0.191
## 2 McKO         5 0.333 0.193
```

Is POMC under circadian regulation?

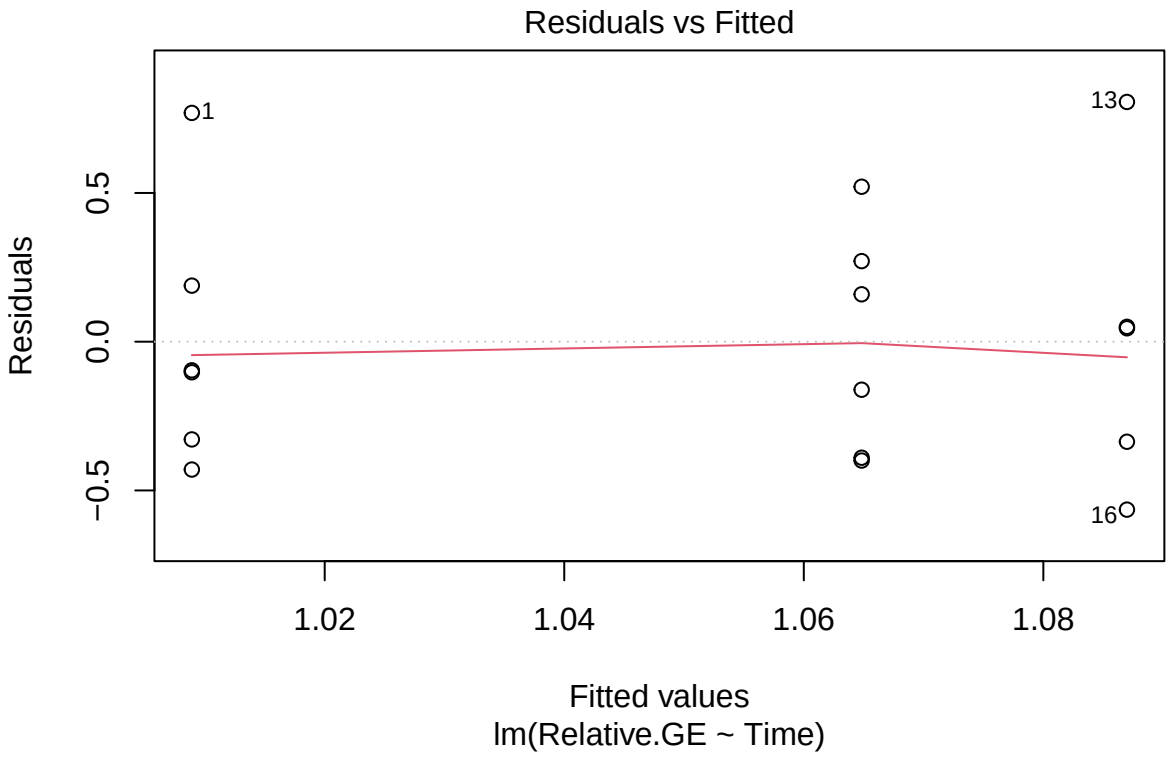


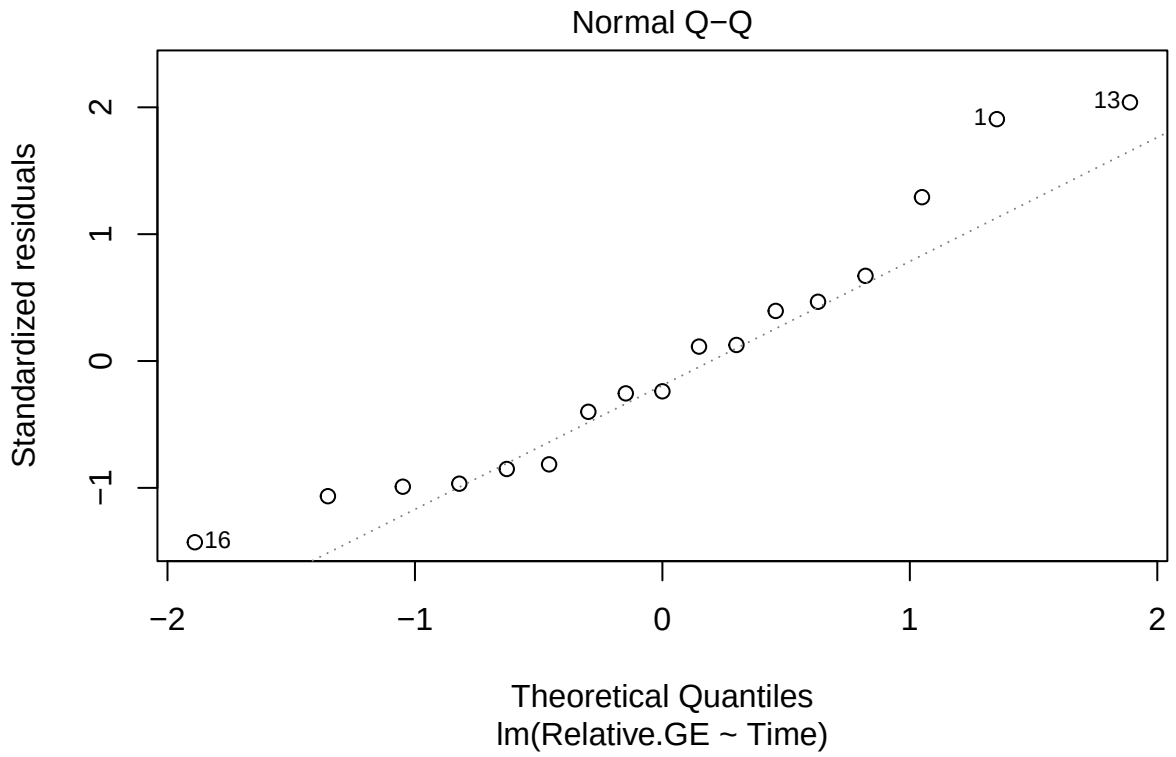

```
## # A tibble: 3 x 4
##   Time      n  mean    sd
##   <fct> <int> <dbl> <dbl>
## 1 2         6  1.01 0.433
## 2 10        6  1.06 0.376
## 3 18        5  1.09 0.521
```




```
##
##  Shapiro-Wilk normality test
##
## data:  pomc_circ_males$Relative.GE
## W = 0.92555, p-value = 0.1832

## Levene's Test for Homogeneity of Variance (center = median)
##       Df F value Pr(>F)
## group  2  0.0726 0.9304
##       14
```


Residuals vs Fitted
Residuals
0.5
0.0
−0.5
1
13
16
1.02
1.04
1.06
1.08
Fitted values
lm(Relative.GE ~ Time)




```
## Analysis of Variance Table
##
## Response: Relative.GE
##           Df  Sum Sq  Mean Sq F value Pr(>F)
## Time       2 0.01824 0.009122  0.0467 0.9545
## Residuals 14 2.73326 0.195233
```

```
##  contrast estimate    SE df t.ratio p.value
##  2 - 10    -0.0559 0.255 14  -0.219  0.9739
##  2 - 18    -0.0781 0.268 14  -0.292  0.9543
##  10 - 18   -0.0221 0.268 14  -0.083  0.9962
##
## P value adjustment: tukey method for comparing a family of 3 estimates
```

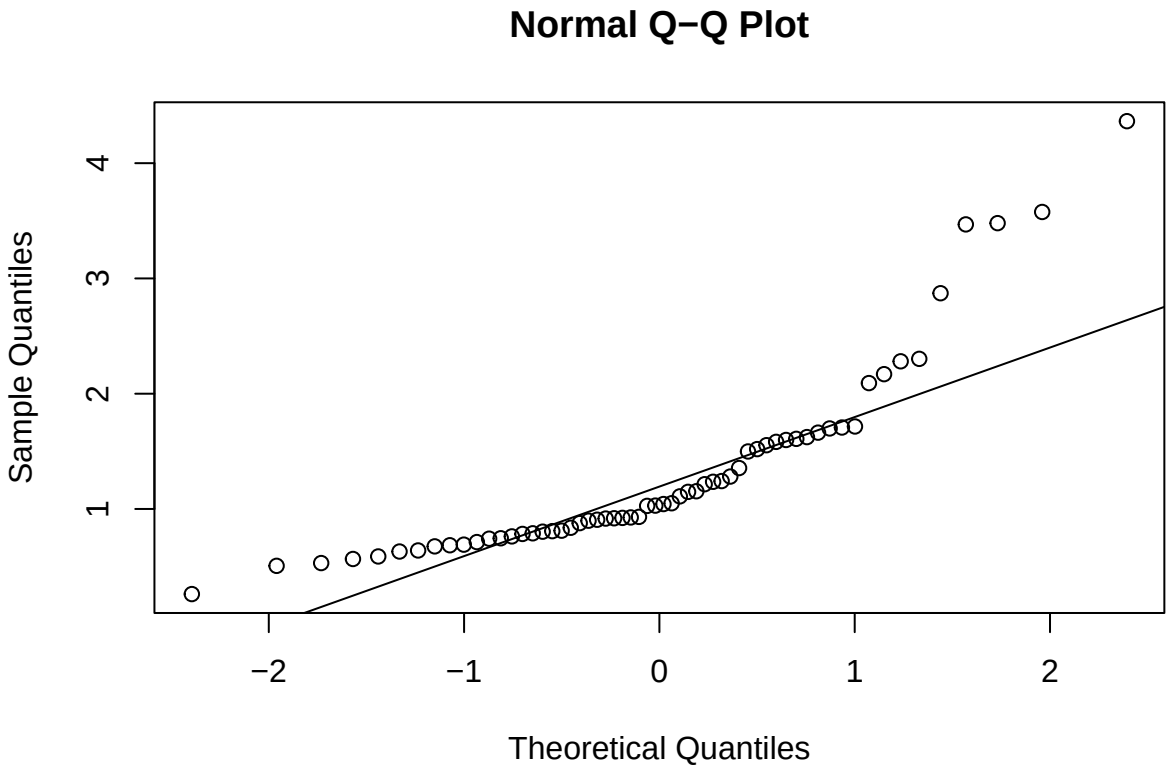
```
## # A tibble: 3 x 4
##   Time      n  mean    sd
##   <fct> <int> <dbl> <dbl>
## 1 2         6  1.01 0.433
## 2 10        6  1.06 0.376
## 3 18        5  1.09 0.521
```

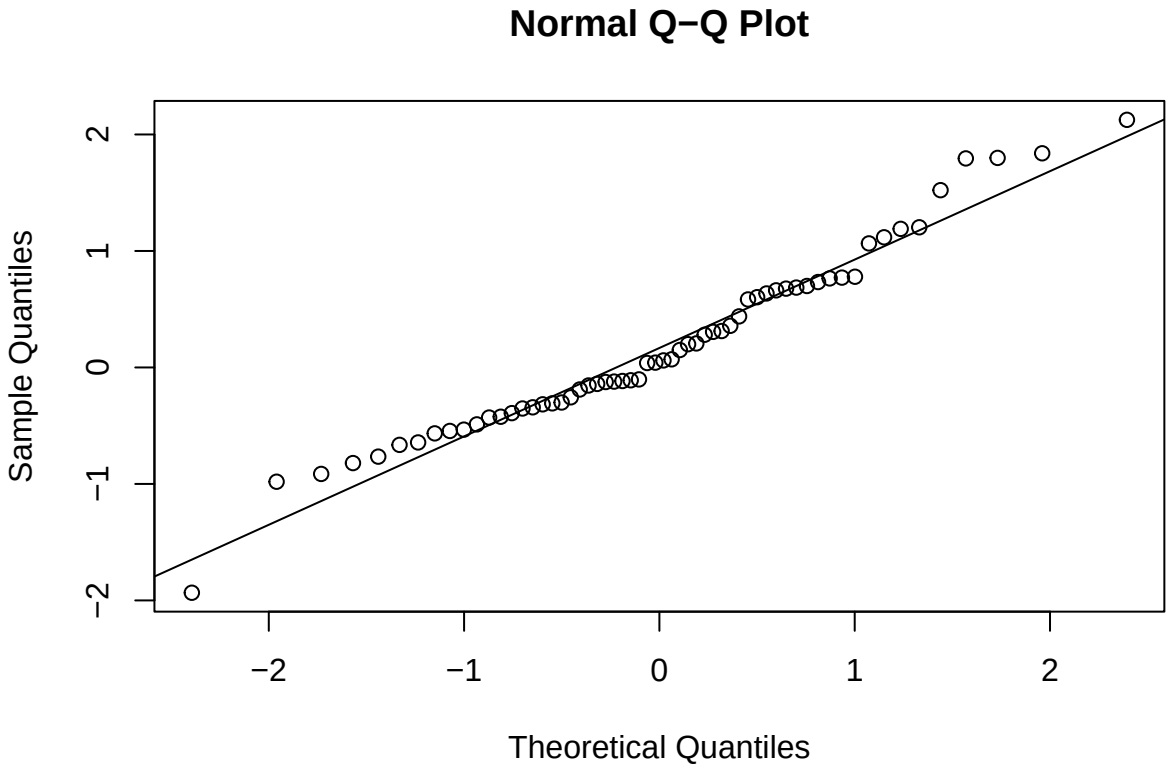
```
## [1] 0.009116243
```

```
## [1] 0.1952332
```

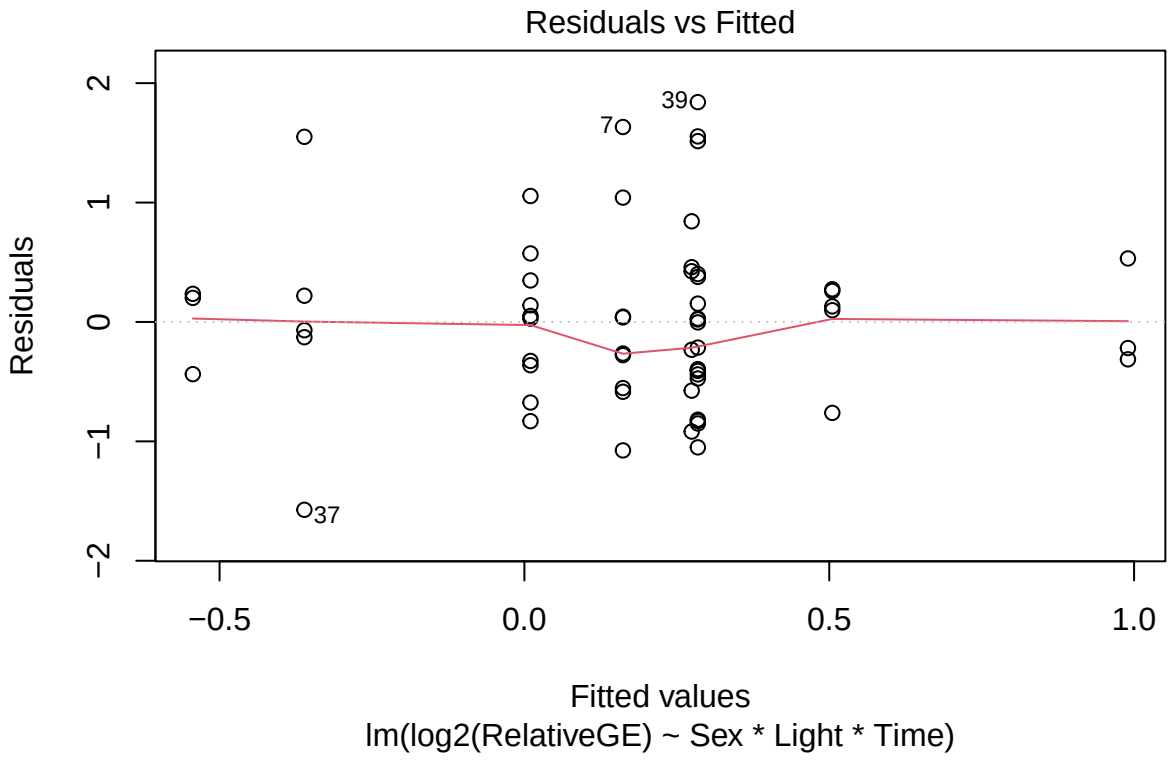
```
##
##      Balanced one-way analysis of variance power calculation
##
##          groups = 3
##               n = 5
##     between.var = 0.009116243
##      within.var = 0.1952332
##       sig.level = 0.05
##           power = 0.07865971
##
## NOTE: n is number in each group
```

POMC circadian + light-dark analysis

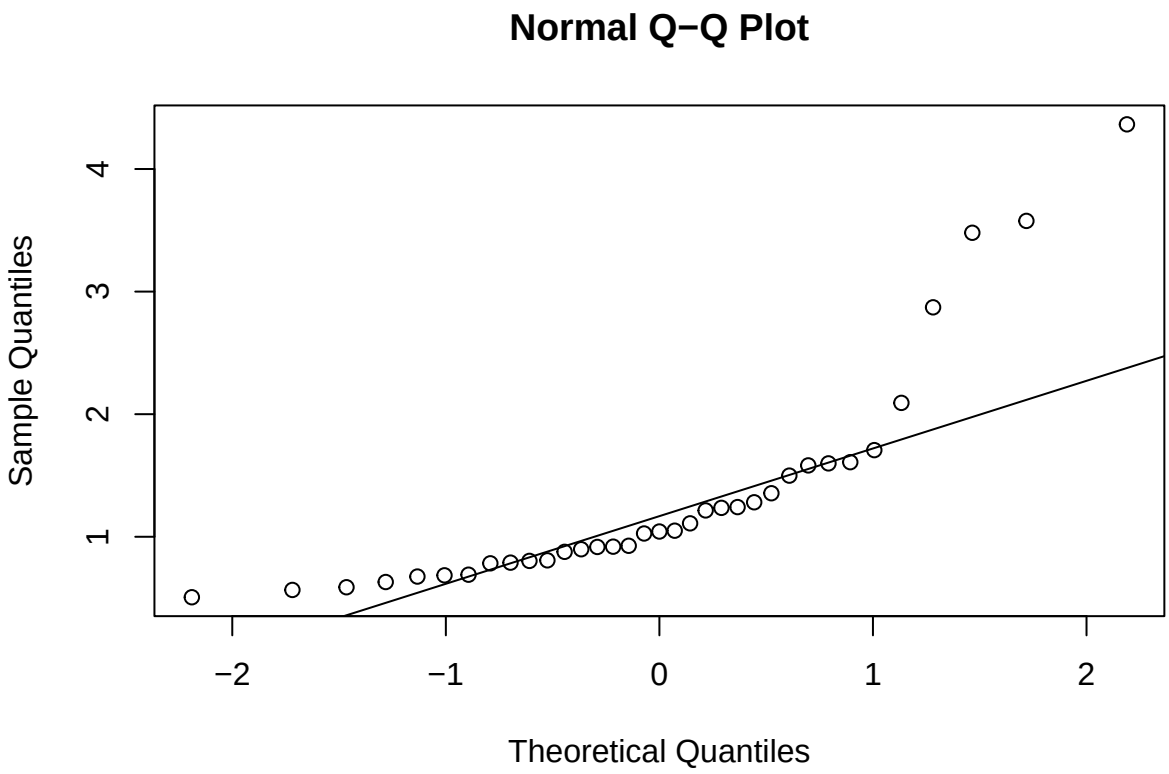


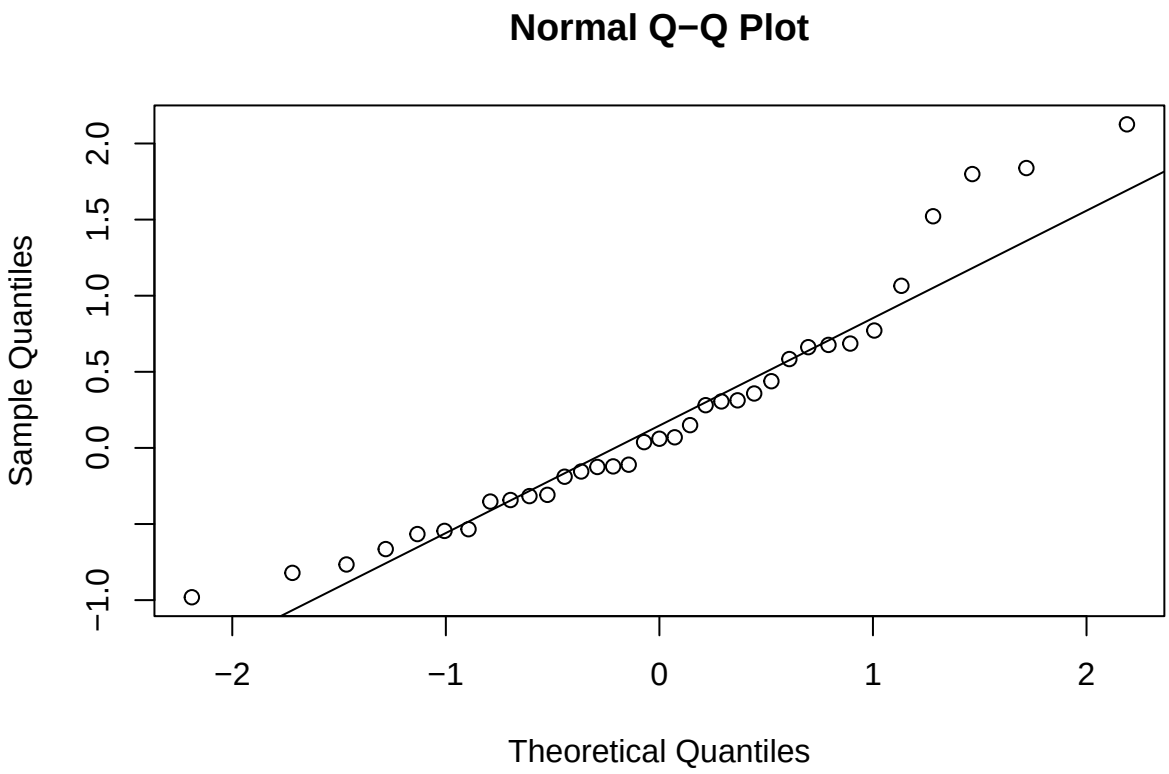


```
##
##  Shapiro-Wilk normality test
##
## data:  log2(pomc_all$RelativeGE)
## W = 0.97065, p-value = 0.157
```



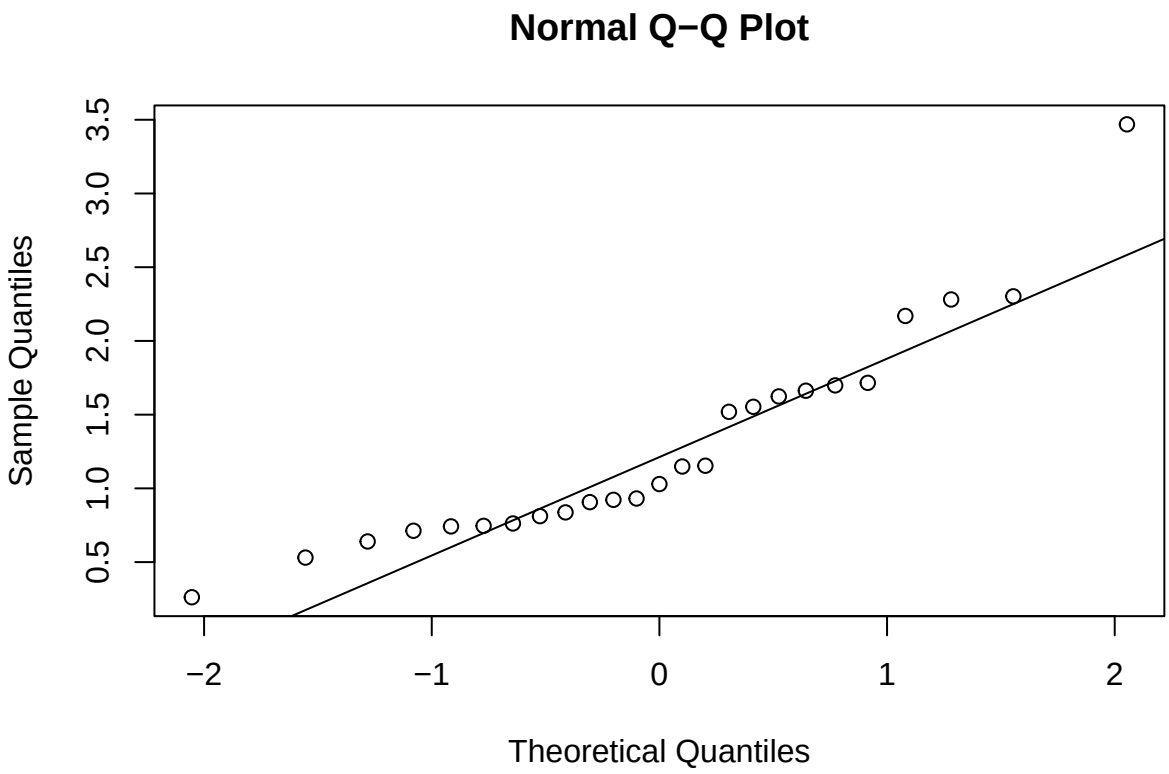

```
## Analysis of Variance Table
##
## Response: log2(RelativeGE)
##                Df  Sum Sq Mean Sq F value  Pr(>F)
## Sex             1  2.4635 2.46353  4.2724 0.04373 *
## Light           1  0.4941 0.49406  0.8568 0.35890
## Time            1  0.0643 0.06430  0.1115 0.73978
## Sex:Light       1  1.0107 1.01073  1.7529 0.19131
## Sex:Time        1  0.4649 0.46485  0.8062 0.37339
## Light:Time      1  0.9614 0.96137  1.6673 0.20234
## Sex:Light:Time  1  0.6250 0.62495  1.0838 0.30266
## Residuals      52 29.9842 0.57662
## ---
## Signif. codes:  0 ’***’ 0.001 ’**’ 0.01 ’*’ 0.05 ’.’ 0.1 ’ ’ 1
```

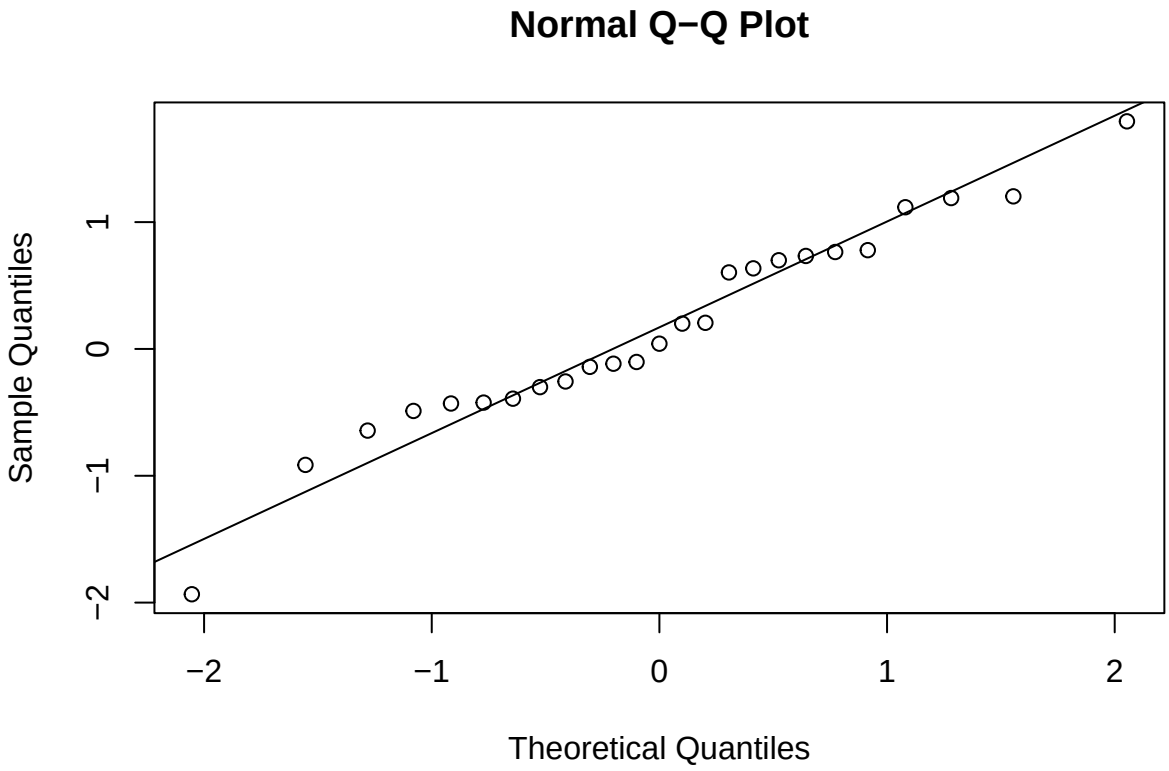

Normal Q−Q Plot
Sample Quantiles
Theoretical Quantiles
1
2
3
4
−2
−1
0
1
2




```
##
##  Shapiro-Wilk normality test
##
## data:  log2(day_pomc_all$RelativeGE)
## W = 0.93297, p-value = 0.03432
```

```
## Analysis of Variance Table
##
## Response: log2(RelativeGE)
##           Df Sum Sq Mean Sq F value Pr(>F)
## Hour       2  0.599 0.29948   0.487 0.6189
## Residuals 32 19.678 0.61495
```

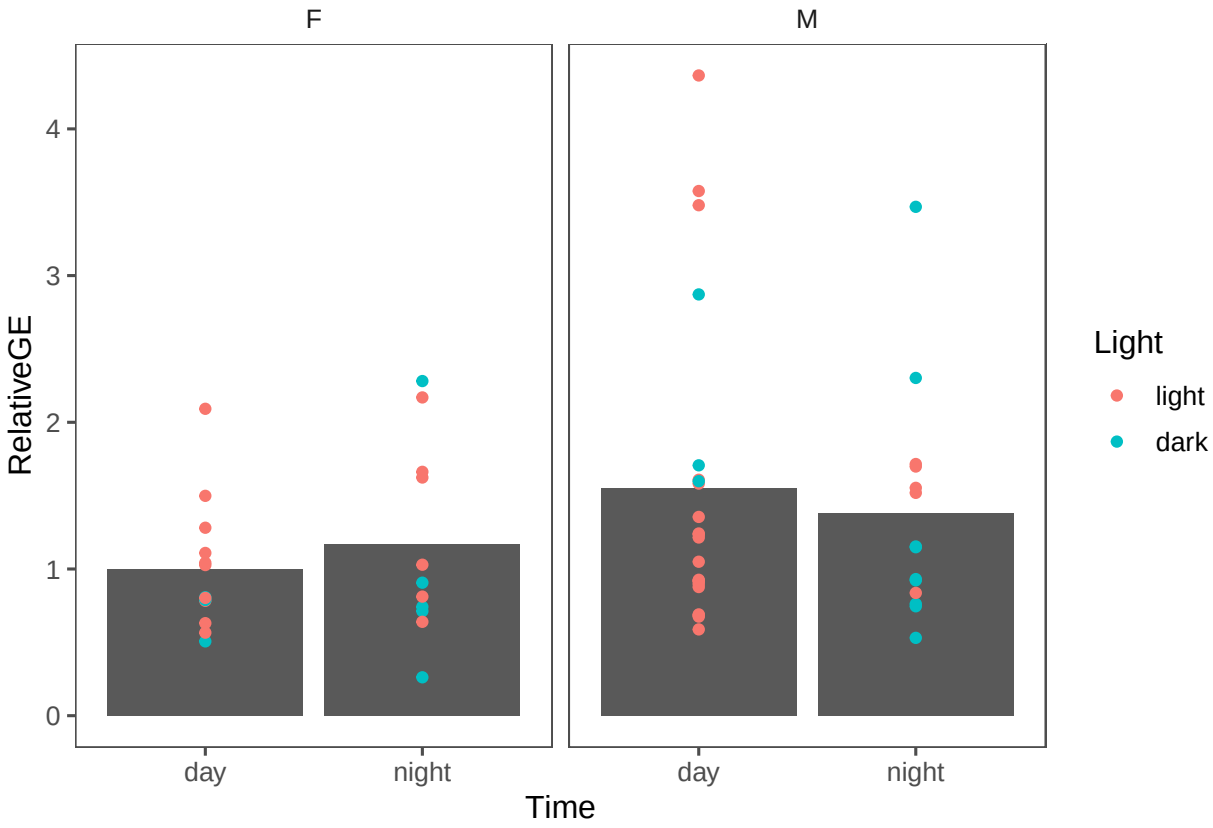

Normal Q−Q Plot
Sample Quantiles
0.5
1.0
1.5
2.0
2.5
3.0
3.5
−2
−1
0
1
2
Theoretical Quantiles

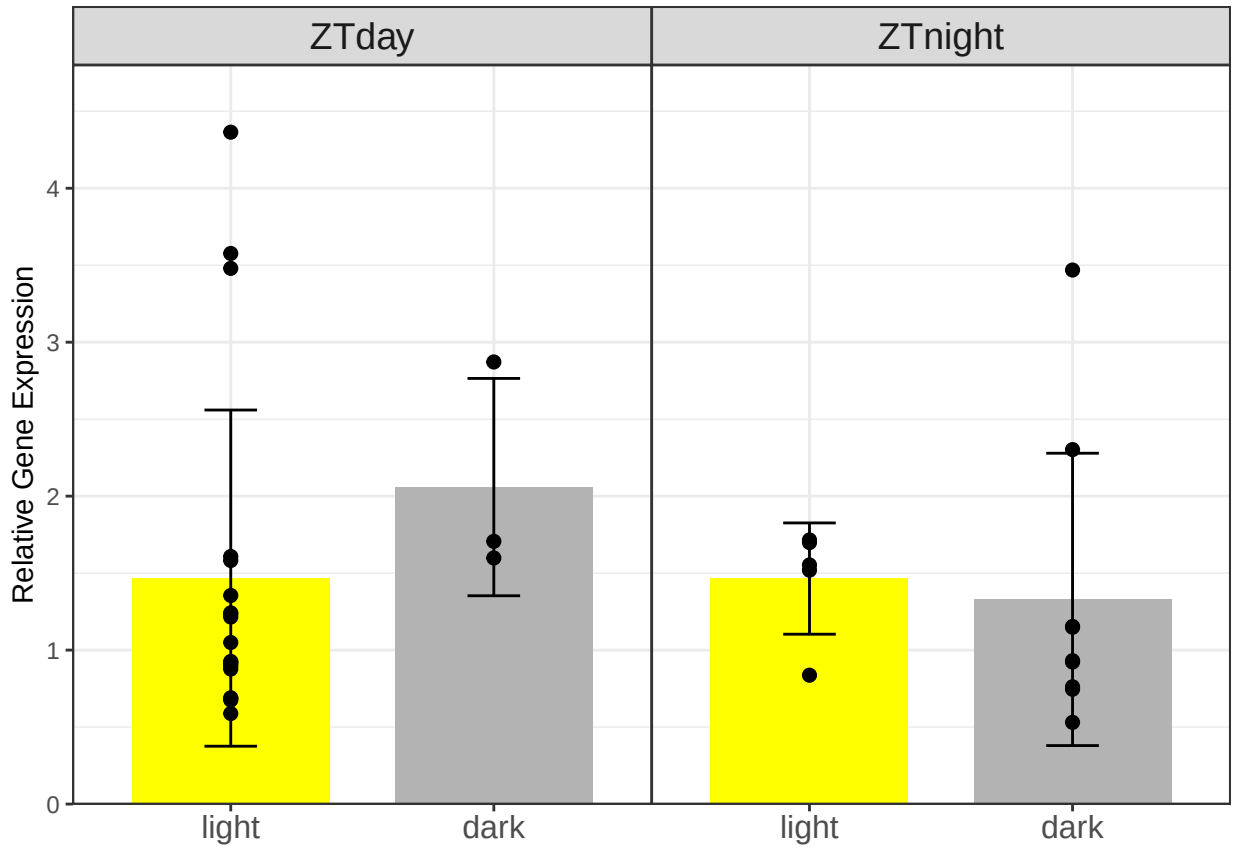



```
##
##  Shapiro-Wilk normality test
##
## data:  log2(night_pomc_all$RelativeGE)
## W = 0.96923, p-value = 0.6256
```

```
## Analysis of Variance Table
##
## Response: log2(RelativeGE)
##           Df  Sum Sq Mean Sq F value Pr(>F)
## Hour       1  0.2848 0.28478  0.4231 0.5218
## Residuals 23 15.4792 0.67301
```

```
##
##  Welch Two Sample t-test
##
## data:  RelativeGE by Hour
## t = 0.83152, df = 10.598, p-value = 0.424
## alternative hypothesis: true difference in means between group 12am and group 1am is not equal to 0
## 95 percent confidence interval:
##  -0.4895652  1.0796662
## sample estimates:
## mean in group 12am  mean in group 1am
##           1.474012           1.178962
```

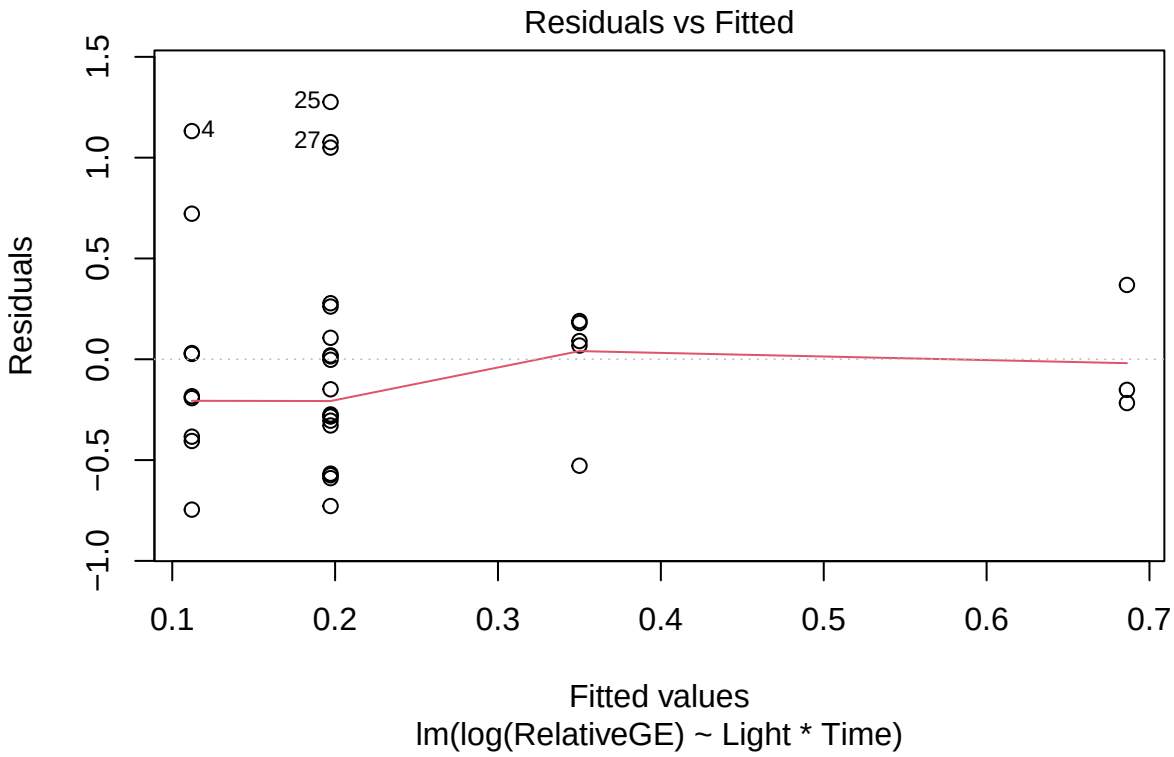

F
M
RelativeGE
0
1
2
3
4
day
night
day
night
Time
Light
light
dark

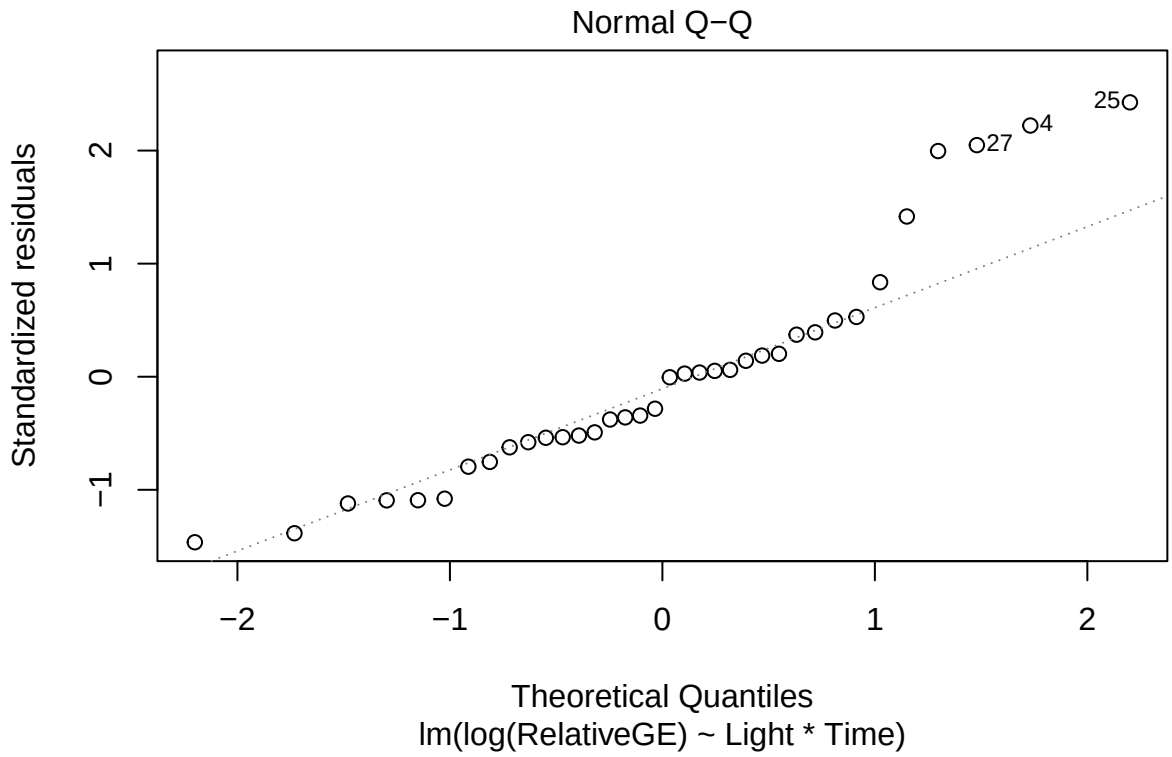



```
##
##  Shapiro-Wilk normality test
##
## data:  m_pomc_all$RelativeGE
## W = 0.78974, p-value = 1.025e-05

##
##  Shapiro-Wilk normality test
##
## data:  log(m_pomc_all$RelativeGE)
## W = 0.94191, p-value = 0.05829

## Levene's Test for Homogeneity of Variance (center = median)
##       Df F value Pr(>F)
## group  3  0.7557 0.5273
##       32
```


Residuals vs Fitted
Residuals
Fitted values
lm(log(RelativeGE) ~ Light * Time)
25
27
4
1.5
1.0
0.5
0.0
−0.5
−1.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7



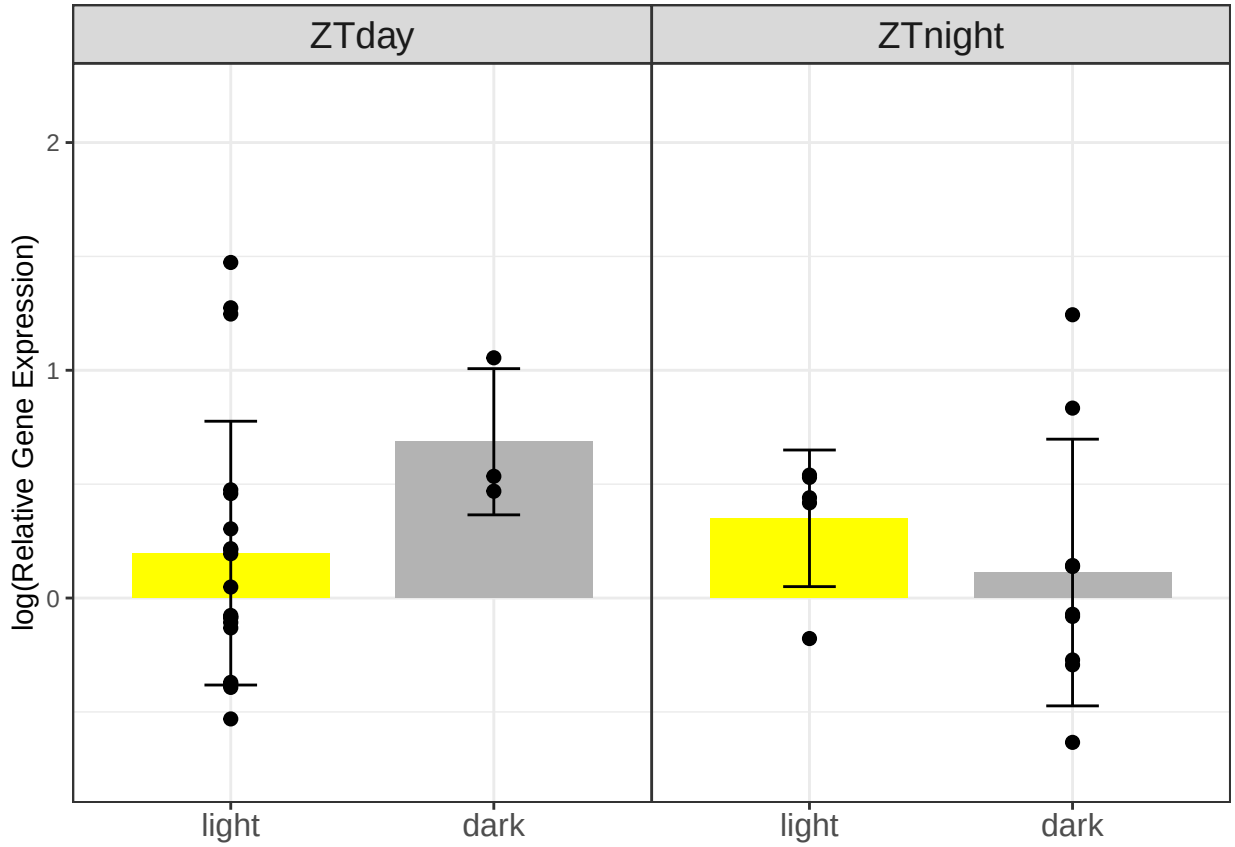

```
## Analysis of Variance Table
##
## Response: log(RelativeGE)
##            Df Sum Sq Mean Sq F value Pr(>F)
## Light       1 0.0056 0.00563  0.0193 0.8904
## Time        1 0.0760 0.07598  0.2602 0.6135
## Light:Time  1 0.7582 0.75816  2.5964 0.1169
## Residuals  32 9.3443 0.29201
```

```
##  contrast                     estimate    SE df t.ratio p.value
##  light ZTday - dark ZTday      -0.4890 0.336 32  -1.457  0.4748
##  light ZTday - light ZTnight   -0.1528 0.272 32  -0.563  0.9424
##  light ZTday - dark ZTnight     0.0852 0.219 32   0.389  0.9796
##  dark ZTday - light ZTnight     0.3361 0.395 32   0.852  0.8293
##  dark ZTday - dark ZTnight      0.5741 0.360 32   1.594  0.3964
##  light ZTnight - dark ZTnight   0.2380 0.301 32   0.790  0.8586
##
## Results are given on the log (not the response) scale.
## P value adjustment: tukey method for comparing a family of 4 estimates
```

```
## Time = ZTday:
##  contrast     estimate    SE df t.ratio p.value
##  light - dark   -0.489 0.336 32  -1.457  0.1550
##
## Time = ZTnight:
```

```
##  contrast     estimate    SE df t.ratio p.value
##  light - dark    0.238 0.301 32   0.790  0.4355
##
## Results are given on the log (not the response) scale.

## Light = light:
##  contrast        estimate    SE df t.ratio p.value
##  ZTday - ZTnight   -0.153 0.272 32  -0.563  0.5776
##
## Light = dark:
##  contrast        estimate    SE df t.ratio p.value
##  ZTday - ZTnight    0.574 0.360 32   1.594  0.1208
##
## Results are given on the log (not the response) scale.
```




```
## # A tibble: 4 x 5
## # Groups:   Light [2]
##   Light Time        n  mean log_mean
##   <fct> <fct>   <int> <dbl>    <dbl>
## 1 light ZTday      19  1.47    0.197
## 2 light ZTnight     5  1.46    0.350
## 3 dark  ZTday       3  2.06    0.686
## 4 dark  ZTnight     9  1.33    0.112

## [1] NaN
```

```
## [1] 0.2920105

##
##      Balanced one-way analysis of variance power calculation
##
##          groups = 4
##               n = 3
##     between.var = 0.0006157598
##      within.var = 0.2920105
##       sig.level = 0.05
##           power = 0.05072033
##
## NOTE: n is number in each group
```