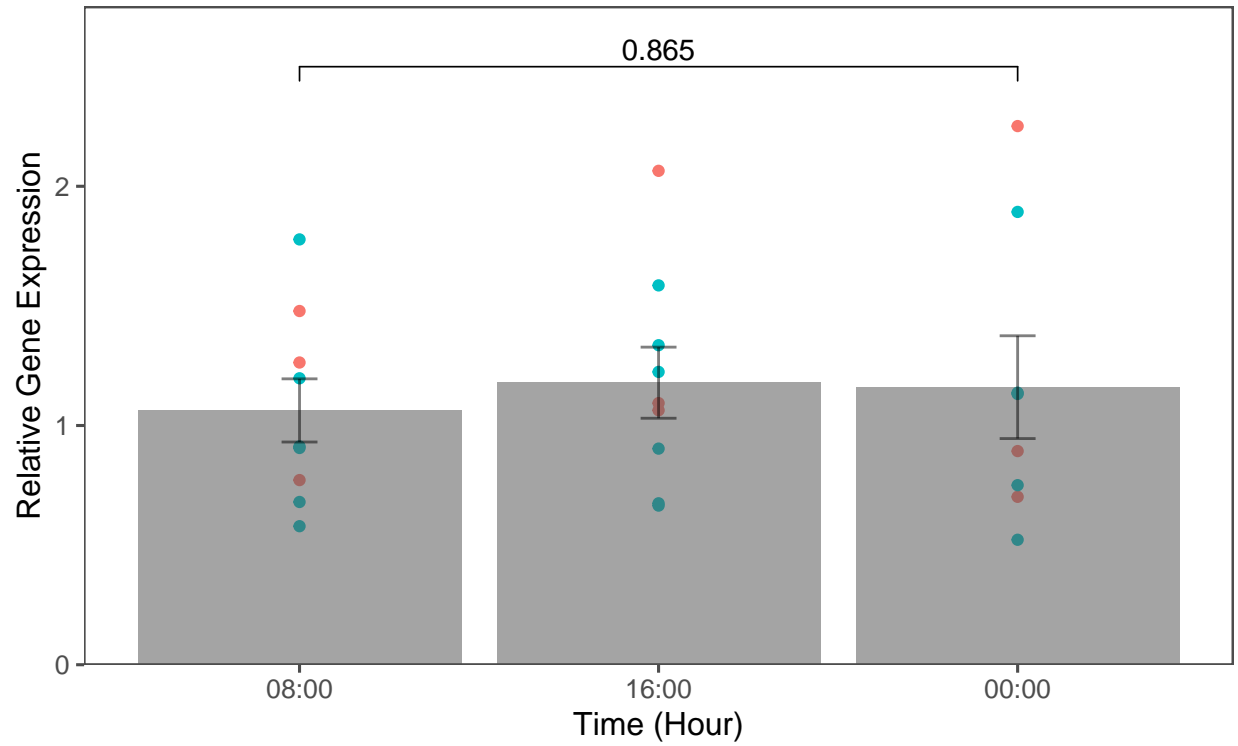# qpCR-Figures

C-T Berezin

10/30/2021

Is POMC under circadian regulation?
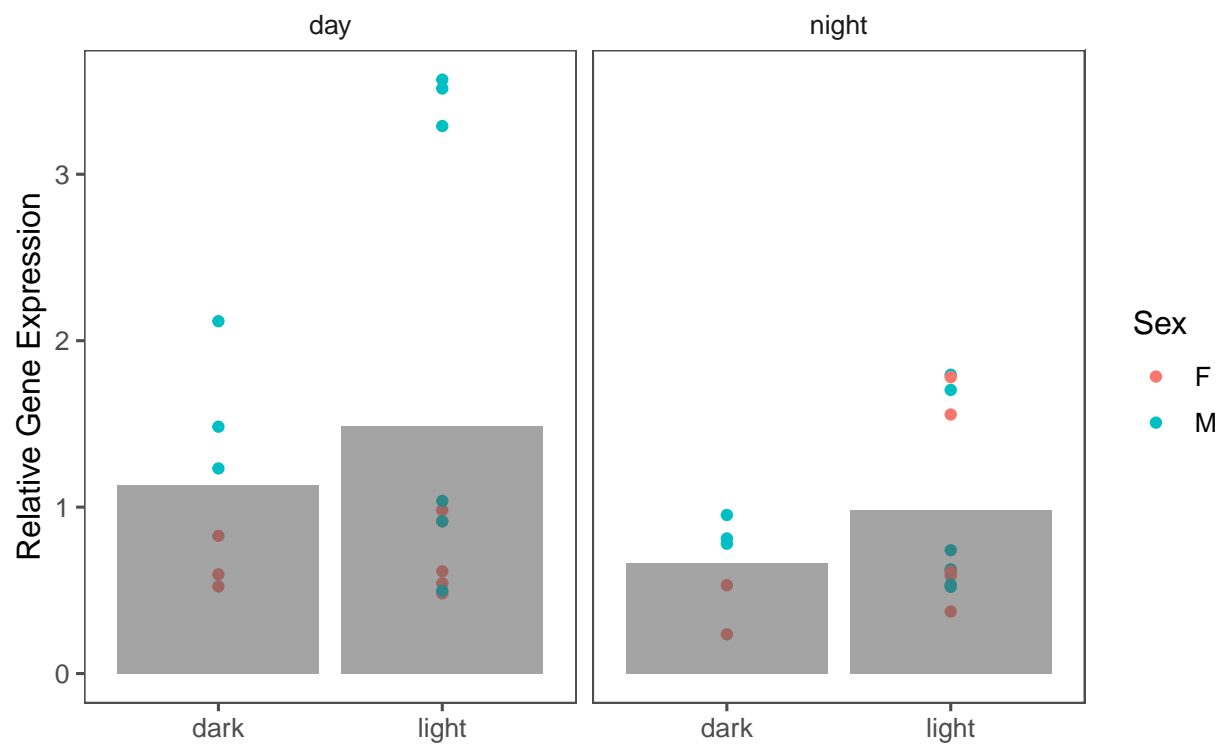
Figure 3
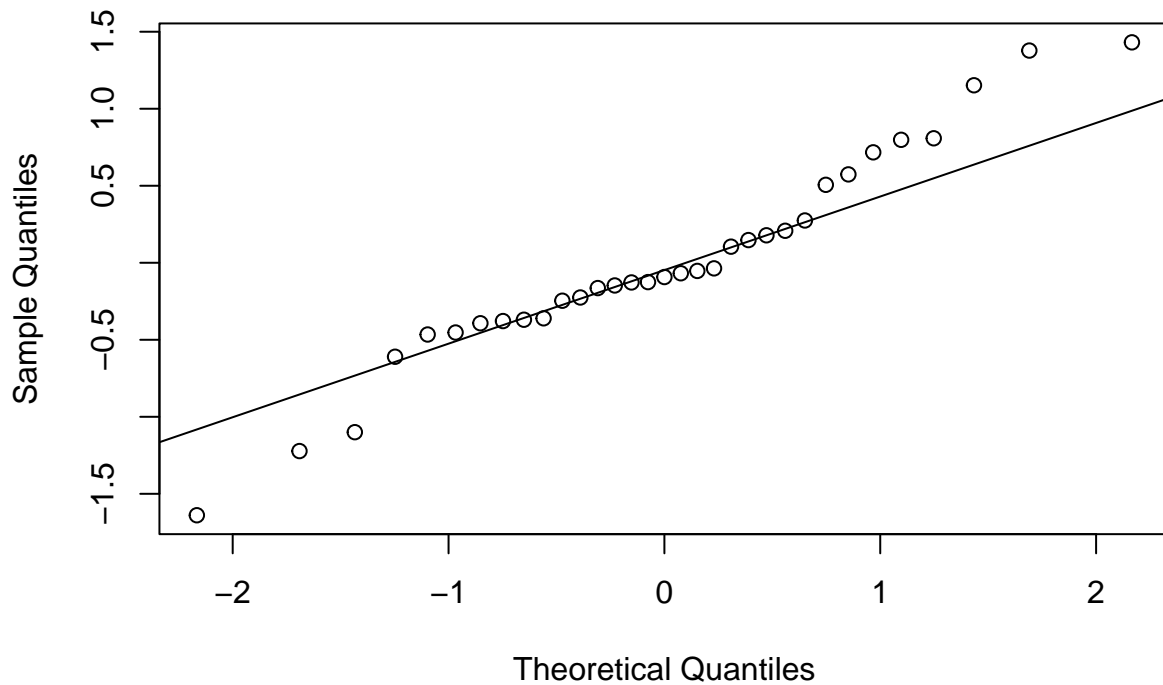### Expression of POMC mRNA

Is POMC expression light-driven?

POMC mRNA Expression


```
##
##  Shapiro-Wilk normality test
##
## data:  pomc_ld$Relative.G.E.
## W = 0.76124, p-value = 6.387e-06
```

Normal Q–Q Plot


```
## 
##  Welch Two Sample t-test
## 
## data:  Relative.G.E. by Sex
## t = -2.6484, df = 23.38, p-value = 0.01425
## alternative hypothesis: true difference in means between group F and group M is not equal to 0
## 95 percent confidence interval:
##  -1.2590046 -0.1553002
## sample estimates:
## mean in group F mean in group M
##       0.7441239       1.4512763

## Analysis of Variance Table
## 
## Response: Relative.G.E.
##               Df  Sum Sq Mean Sq F value  Pr(>F)
## Sex            1  4.0914  4.0914  6.9085 0.01446 *
## Light          1  0.7450  0.7450  1.2580 0.27270
## Time           1  2.1772  2.1772  3.6763 0.06669 .
## Sex:Light      1  0.0008  0.0008  0.0014 0.97091
## Sex:Time       1  2.5523  2.5523  4.3096 0.04834 *
## Light:Time     1  0.0015  0.0015  0.0025 0.96038
## Sex:Light:Time 1  0.3867  0.3867  0.6530 0.42667
## Residuals     25 14.8058  0.5922
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
##   Tukey multiple comparisons of means
##     95% family-wise confidence level
##
## Fit: aov(formula = pomc_ld_lm)
##
## $Sex
##         diff      lwr      upr      p adj
## M-F 0.7071524 0.153048 1.261257 0.0144557
##
## $Light
##                  diff       lwr       upr      p adj
## light-dark 0.3187344 -0.2665485 0.9040173 0.2726958
##
## $Time
##                 diff       lwr       upr      p adj
## night-day -0.5131982 -1.065262 0.03886529 0.0670614
##
## $`Sex:Light`
##                      diff          lwr        upr      p adj
## M:dark-F:dark   0.7211503 -0.56063890 2.0029395 0.4255743
## F:light-F:dark  0.3301872 -0.82923474 1.4896092 0.8612768
## M:light-F:dark  1.0303407 -0.09641495 2.1570963 0.0818368
## F:light-M:dark -0.3909631 -1.48407659 0.7021504 0.7598424
## M:light-M:dark  0.3091904 -0.74921224 1.3675930 0.8521175
## M:light-F:light 0.7001534 -0.20620839 1.6065153 0.1728438
##
## $`Sex:Time`
##                      diff          lwr         upr      p adj
## M:day-F:day      1.26278520  0.2342028  2.29136764 0.0120273
## F:night-F:day    0.09714678 -0.9984040  1.19269755 0.9947655
## M:night-F:day    0.24218992 -0.7863925  1.27077236 0.9153692
## F:night-M:day   -1.16563842 -2.2324080 -0.09886887 0.0284881
## M:night-M:day   -1.02059528 -2.0184668 -0.02272374 0.0436577
## M:night-F:night  0.14504315 -0.9217264  1.21181269 0.9817488
##
## $`Light:Time`
##                            diff        lwr        upr      p adj
## light:day-dark:day     0.3295261 -0.7447932 1.4038454 0.8331289
## dark:night-dark:day   -0.5320491 -1.8138383 0.7497401 0.6678291
## light:night-dark:day  -0.1757383 -1.2500577 0.8985810 0.9690230
## dark:night-light:day  -0.8615752 -2.0032950 0.2801446 0.1885459
## light:night-light:day -0.5052644 -1.4078732 0.3973443 0.4299273
## light:night-dark:night 0.3563108 -0.7854090 1.4980306 0.8259208
##
## $`Sex:Light:Time`
##                                 diff          lwr        upr      p adj
## M:dark:day-F:dark:day      0.961792839 -1.1118752 3.0354609 0.7842025
## F:light:day-F:dark:day     0.057760479 -1.7969846 1.9125056 1.0000000
## M:light:day-F:dark:day     1.488094717 -0.3077545 3.2839439 0.1583872
## F:dark:night-F:dark:day   -0.266075163 -2.5845065 2.0523562 0.9999303
## M:dark:night-F:dark:day    0.199019353 -1.8746487 2.2726874 0.9999792
## F:light:night-F:dark:day   0.333603409 -1.5211417 2.1883485 0.9986579
## M:light:night-F:dark:day   0.337890204 -1.4579590 2.1337394 0.9982137
## F:light:day-M:dark:day    -0.904032359 -2.7587774 0.9507127 0.7410782
```
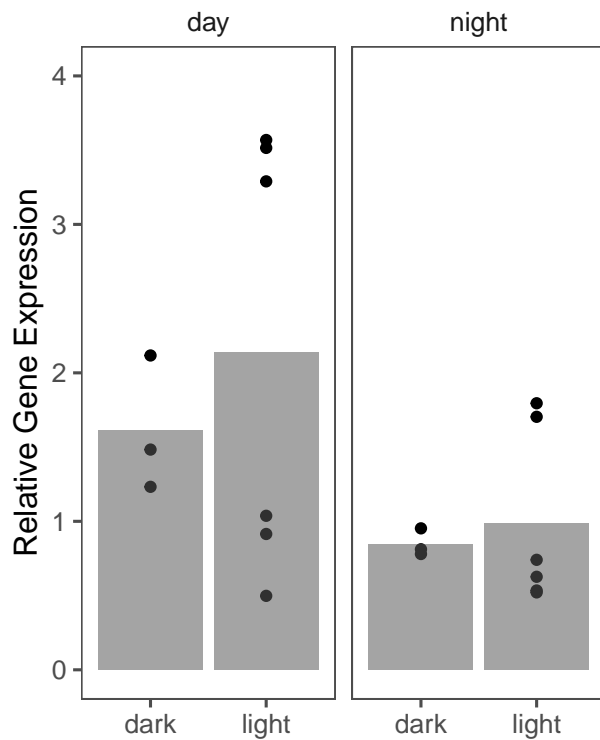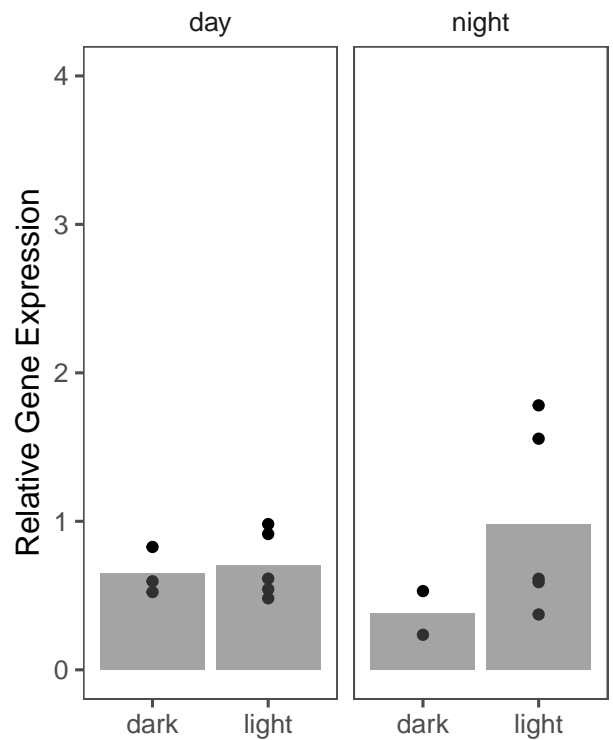
```
## M:light:day-M:dark:day          0.526301878 -1.2695473 2.3221511 0.9751004
## F:dark:night-M:dark:day        -1.227868002 -3.5462994 1.0905633 0.6580686
## M:dark:night-M:dark:day        -0.762773486 -2.8364415 1.3108946 0.9201432
## F:light:night-M:dark:day       -0.628189430 -2.4829345 1.2265556 0.9466955
## M:light:night-M:dark:day       -0.623902635 -2.4197518 1.1719466 0.9394779
## M:light:day-F:light:day         1.430334237 -0.1075391 2.9682076 0.0817383
## F:dark:night-F:light:day       -0.323835643 -2.4487131 1.8010418 0.9995401
## M:dark:night-F:light:day        0.141258874 -1.7134862 1.9960040 0.9999957
## F:light:night-F:light:day       0.275842930 -1.3304134 1.8820993 0.9990020
## M:light:night-F:light:day       0.280129724 -1.2577437 1.8180031 0.9985453
## F:dark:night-M:light:day       -1.754169880 -3.8278379 0.3194982 0.1421939
## M:dark:night-M:light:day       -1.289075364 -3.0849246 0.5067738 0.2984509
## F:light:night-M:light:day      -1.154491308 -2.6923647 0.3833821 0.2500589
## M:light:night-M:light:day      -1.150204513 -2.6165092 0.3161002 0.2064938
## M:dark:night-F:dark:night       0.465094516 -1.8533368 2.7835259 0.9973289
## F:light:night-F:dark:night      0.599678572 -1.5251989 2.7245560 0.9797791
## M:light:night-F:dark:night      0.603965367 -1.4697027 2.6776334 0.9759316
## F:light:night-M:dark:night      0.134584056 -1.7201610 1.9893291 0.9999970
## M:light:night-M:dark:night      0.138870851 -1.6569783 1.9347201 0.9999953
## M:light:night-F:light:night     0.004286795 -1.5335866 1.5421602 1.0000000
```
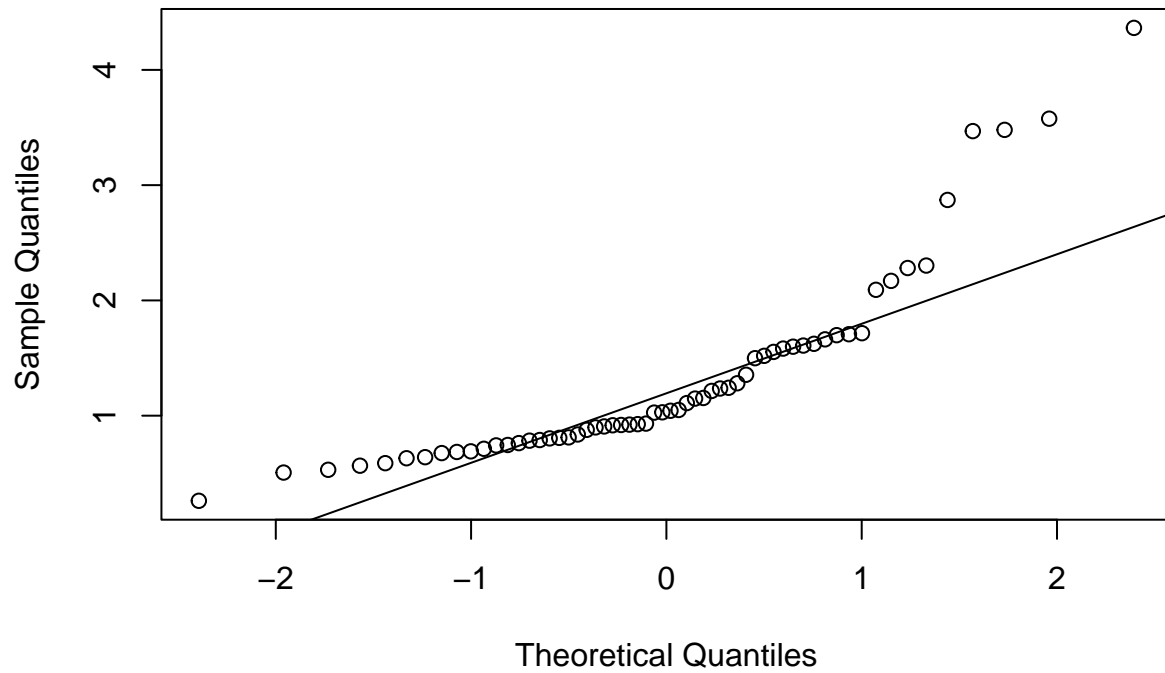

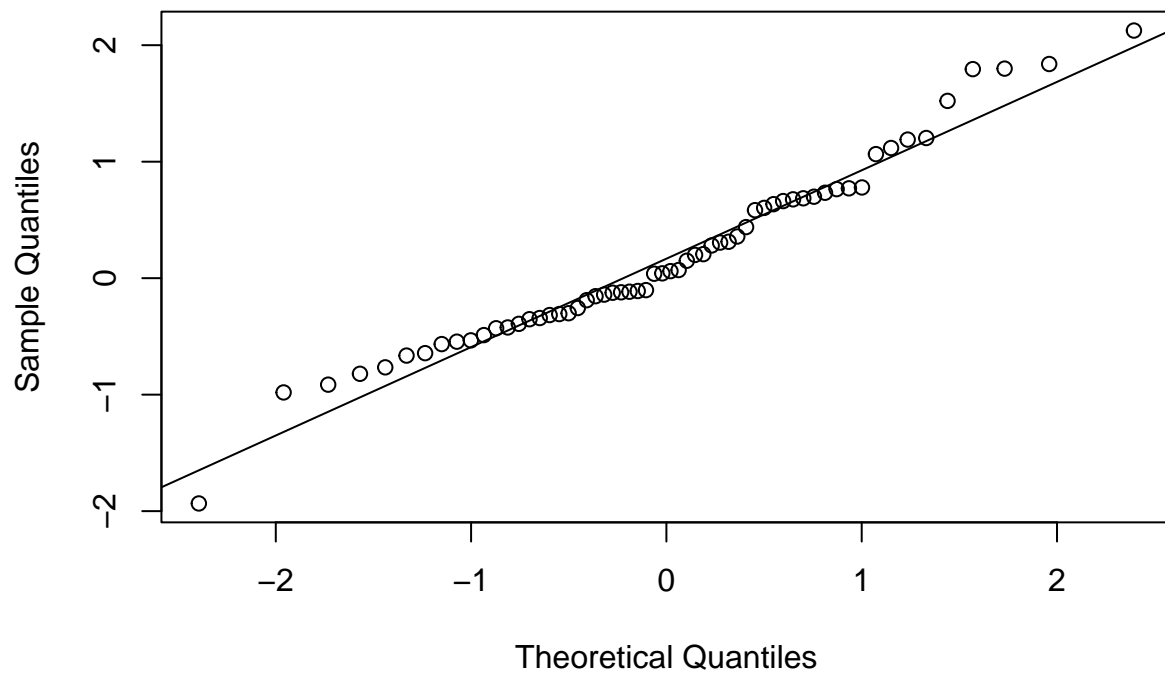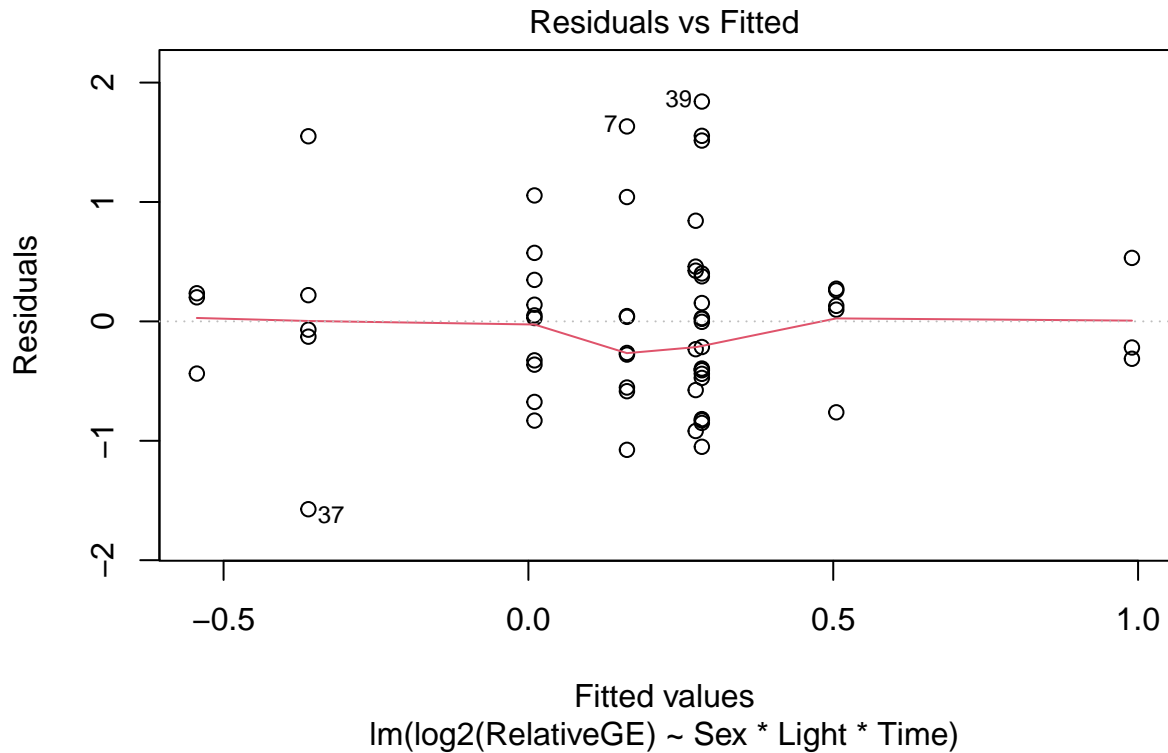POMC mRNA in Males   POMC mRNA in Females

Normal Q–Q Plot

Sample Quantiles

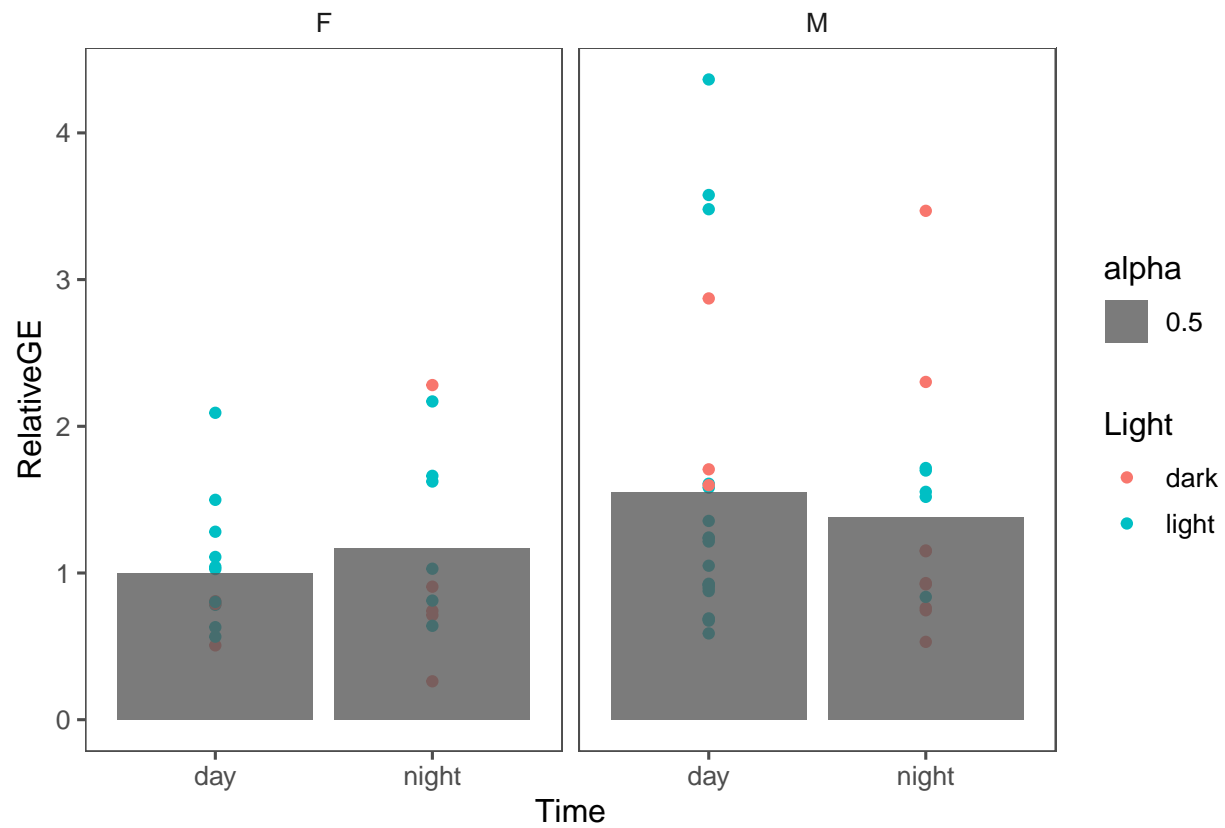Theoretical Quantiles

Normal Q–Q Plot

Sample Quantiles

Theoretical Quantiles

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

Residuals vs Fitted

lm(log2(RelativeGE) ~ Sex * Light * Time)

```
## 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
```
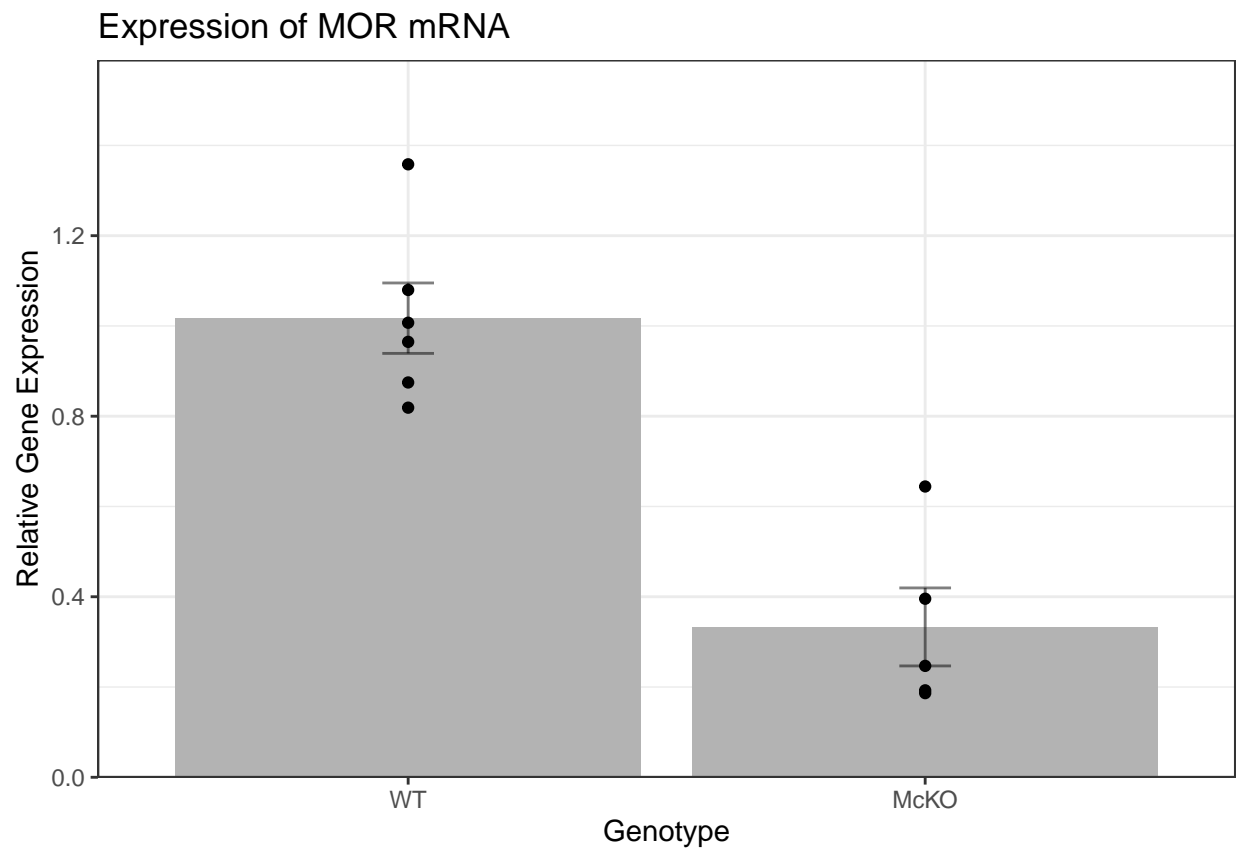
```
## # A tibble: 2 x 3
##   Time      n  mean
##   <fct> <int> <dbl>
## 1 day      22  1.55
## 2 night    14  1.38
```

Expression of MOR mRNA

Expression of MOR mRNA