Spacek et al., 2021, Figure 1-Supplement 4

Figure 1-Supplement 4e

Effect of suppression on firing rate - movies

```
# Random intercept, random slope for neurons,
# random intercept for experiments
lmer.1_S4e = lmer(rates ~ feedback + (1 + feedback | uid) + (1 | eid),
                  data = tb %>% drop_na(rates))

display(lmer.1_S4e)
```

```
## lmer(formula = rates ~ feedback + (1 + feedback | uid) + (1 |
##     eid), data = tb %>% drop_na(rates))
##             coef.est coef.se
## (Intercept) 8.65     0.99
## feedback    1.35     0.36
##
## Error terms:
##  Groups   Name        Std.Dev. Corr
##  uid      (Intercept) 6.58
##           feedback    2.80     0.43
##  eid      (Intercept) 1.49
##  Residual             5.27
## ---
## number of obs: 23200, groups: uid, 62; eid, 9
## AIC = 143598, DIC = 143587.2
## deviance = 143585.7
```

```
anova(lmer.1_S4e)
```

```
## Type III Analysis of Variance Table with Satterthwaite's method
##          Sum Sq Mean Sq NumDF  DenDF F value    Pr(>F)
## feedback 386.47  386.47     1 60.566  13.891 0.0004281 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Feedback: 10.00 spikes/s
Suppression: 8.65 spikes/s
n = 62 neurons from 3 mice

Figure 1-Supplement 4f

Effect of suppression on burst ratio - movies

```
# Random intercept, random slope for neurons,
# random intercept for experiments, nested in series
lmer.1_S4f = lmer(burstratios ~ feedback + (1 + feedback | uid) + (1 | sid/eid),
                  data = tb %>% drop_na(burstratios))

display(lmer.1_S4f)
```

```
## lmer(formula = burstratios ~ feedback + (1 + feedback | uid) +
##     (1 | sid/eid), data = tb %>% drop_na(burstratios))
##             coef.est coef.se
## (Intercept)  0.13     0.02
## feedback    -0.04     0.01
##
## Error terms:
##  Groups   Name        Std.Dev. Corr
##  uid      (Intercept) 0.09
##           feedback    0.04     -0.80
##  eid:sid  (Intercept) 0.01
##  sid      (Intercept) 0.06
##  Residual             0.17
## ---
## number of obs: 22270, groups: uid, 62; eid:sid, 9; sid, 8
## AIC = -15214.7, DIC = -15259.4
## deviance = -15245.1
```

```
anova(lmer.1_S4f)
```

```
## Type III Analysis of Variance Table with Satterthwaite's method
##          Sum Sq Mean Sq NumDF  DenDF F value    Pr(>F)
## feedback 1.4252  1.4252     1 62.669  49.051 2.017e-09 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Feedback: 0.086
Suppression: 0.13
n = 62 neurons from 3 mice

Figure 1-Supplement 4g

Effect of suppression on sparseness - movies

```
# Random intercept, random slope for single neurons,
# random intercept for series
lmer.1_S4g = lmer(spars ~ feedback + (1 + feedback | uid) + (1 | sid),
                  data = tbgh %>% drop_na(spars))

display(lmer.1_S4g)
```

```
## lmer(formula = spars ~ feedback + (1 + feedback | uid) + (1 |
##     sid), data = tbgh %>% drop_na(spars))
##             coef.est coef.se
## (Intercept)  0.36     0.03
## feedback    -0.05     0.01
##
## Error terms:
##  Groups   Name        Std.Dev. Corr
##  uid      (Intercept) 0.16
##           feedback    0.04     -0.27
##  sid      (Intercept) 0.04
##  Residual             0.04
## ---
## number of obs: 136, groups: uid, 62; sid, 8
## AIC = -222.3, DIC = -262.9
## deviance = -249.6
```

```
anova(lmer.1_S4g)
```

```
## Type III Analysis of Variance Table with Satterthwaite's method
##            Sum Sq  Mean Sq NumDF  DenDF F value    Pr(>F)
## feedback 0.058814 0.058814     1 57.742  39.861 4.189e-08 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Feedback: 0.31
Suppression: 0.36
n = 62 neurons from 3 mice

Figure 1-Supplement 4h

Effect of suppression on reliability - movies

```
# Random intercept, random slope for neurons,
# random intercept for experiments, nested in mice
lmer.1_S4h = lmer(rel ~ feedback + (1 +feedback | uid) + (1 | mid/eid),
                  data = tbgh %>% drop_na(rel))

display(lmer.1_S4h)
```

```
## lmer(formula = rel ~ feedback + (1 + feedback | uid) + (1 | mid/eid),
##     data = tbgh %>% drop_na(rel))
##             coef.est coef.se
## (Intercept)  0.11     0.01
## feedback    -0.01     0.00
##
## Error terms:
##  Groups   Name        Std.Dev. Corr
##  uid      (Intercept) 0.08
##           feedback    0.02     -0.54
##  eid:mid  (Intercept) 0.01
##  mid      (Intercept) 0.00
##  Residual             0.02
## ---
## number of obs: 136, groups: uid, 62; eid:mid, 9; mid, 3
## AIC = -416.2, DIC = -465.4
## deviance = -448.8
```

```
anova(lmer.1_S4h)
```

```
## Type III Analysis of Variance Table with Satterthwaite's method
##             Sum Sq   Mean Sq NumDF DenDF F value  Pr(>F)
## feedback 0.0020995 0.0020995     1 47.93  5.0766 0.02886 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Feedback: 0.10
Suppression: 0.11
n = 62 neurons from 3 mice

Figure 1-Supplement 4l

Effect of suppression on firing rate - gratings

```
# Random intercept, random slope for neurons,
# random intercept for experiments nested in series
lmer.1_S4l = lmer(rates ~ feedback + (1 + feedback | uid) + (1 | sid/eid),
                  data = tb %>% drop_na(rates))

display(lmer.1_S4l)
```

```
## lmer(formula = rates ~ feedback + (1 + feedback | uid) + (1 |
##     sid/eid), data = tb %>% drop_na(rates))
##             coef.est coef.se
## (Intercept) 11.26     1.77
## feedback     0.18     0.66
##
## Error terms:
##  Groups   Name        Std.Dev. Corr
##  uid      (Intercept) 9.54
##           feedback    5.58     0.11
##  eid:sid  (Intercept) 2.83
##  sid      (Intercept) 2.86
##  Residual             6.91
## ---
## number of obs: 25960, groups: uid, 73; eid:sid, 13; sid, 8
## AIC = 174839, DIC = 174830.4
## deviance = 174826.5
```

```
anova(lmer.1_S4l)
```

```
## Type III Analysis of Variance Table with Satterthwaite's method
##          Sum Sq Mean Sq NumDF DenDF F value Pr(>F)
## feedback 3.5764  3.5764     1 71.41  0.0749 0.7851
```

Feedback: 11.44 spikes/s
Suppression: 11.26 spikes/s
n = 73 neurons from 3 mice

Figure 1-Supplement 4m

Effect of suppression on burst ratio - gratings

```
# Random intercept, random slope for neurons,
# random intercept for experiments
lmer.1_S4m = lmer(burstratios ~ feedback + (1 + feedback | uid) + (1 | eid),
                  data = tb %>% drop_na(burstratios))

display(lmer.1_S4m)
```

```
## lmer(formula = burstratios ~ feedback + (1 + feedback | uid) +
##     (1 | eid), data = tb %>% drop_na(burstratios))
##             coef.est coef.se
## (Intercept)  0.11     0.02
## feedback    -0.08     0.01
##
## Error terms:
##  Groups   Name        Std.Dev. Corr
##  uid      (Intercept) 0.13
##           feedback    0.11     -0.98
##  eid      (Intercept) 0.04
##  Residual             0.15
## ---
## number of obs: 22885, groups: uid, 73; eid, 13
## AIC = -21429.4, DIC = -21471.6
## deviance = -21457.5
```

```
anova(lmer.1_S4m)
```

```
## Type III Analysis of Variance Table with Satterthwaite's method
##           Sum Sq Mean Sq NumDF  DenDF F value    Pr(>F)
## feedback 0.81475 0.81475     1 72.076  36.294 6.532e-08 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Feedback: 0.031
Suppression: 0.11
n = 73 neurons from 3 mice

Figure 1-Supplement 4n

Effect of suppression on F1/F0 - gratings

```
# Random intercept for neurons,
# random intercept for experiments, nested in series
lmer.1_S4n = lmer(f1f0 ~ feedback + (1 | uid) + (1 | sid/eid),
                  data = tbn %>% drop_na(f1f0))

display(lmer.1_S4n)
```

```
## lmer(formula = f1f0 ~ feedback + (1 | uid) + (1 | sid/eid), data = tbn %>%
##     drop_na(f1f0))
##             coef.est coef.se
## (Intercept)  1.33     0.07
## feedback    -0.13     0.03
##
## Error terms:
##  Groups   Name        Std.Dev.
##  uid      (Intercept) 0.33
##  eid:sid  (Intercept) 0.09
##  sid      (Intercept) 0.11
##  Residual             0.25
## ---
## number of obs: 220, groups: uid, 73; eid:sid, 13; sid, 8
## AIC = 170.8, DIC = 141.4
## deviance = 150.1
```

```
anova(lmer.1_S4n)
```

```
## Type III Analysis of Variance Table with Satterthwaite's method
##           Sum Sq Mean Sq NumDF  DenDF F value   Pr(>F)
## feedback 0.86189 0.86189     1 136.41  14.156 0.000249 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Feedback: 1.20
Suppression: 1.33
n = 73 neurons from 3 mice