

## Supplemental Information

### Figure S1. Related to Figure 1

**(A-H)** Representative coronal sections of E13.5 developing mouse forebrain immunolabeled for MEK1. High expression of MEK1 was detected in RFP-labeled cells in *caMek1 Slc32A1:Cre* ganglionic eminences and CIN migratory streams (compare **C** to **G**; **D** to **H**). **(I)** *CaMek1 Slc32A1:Cre* mice exhibited significantly increased body mass in adulthood as compared to controls (n = 12 controls, 12 mutants; mean  $\pm$  SEM, \* = p < 0.05). **(J-O)** Mutant CINs display increased MEK1 expression into adulthood (n=3). (Scale bar = 25  $\mu$ m)

### Figure S2. Related to Figure 2

**(A-D)** P30 coronal sections of *caMek1 Dlx5/6:Cre* primary sensory cortex revealed a substantial qualitative decrease in the number of PV-CINs relative to controls (n=3). **(E-M)** Representative confocal images of P14 *caMek1 Nkx2.1:Cre* sensory cortices immunolabeled for PV. The number of PV<sup>+</sup>/RFP<sup>+</sup> co-expressing cells was significantly decreased in mutants as compared to littermate controls (quantification in **M**: n = 3; mean  $\pm$  SEM, \* = p < 0.05).

### Figure S3. Related to Figure 3

**(A-F)** Representative sagittal sections of P14 *Erk1<sup>-/-</sup>, Erk2<sup>fl/fl</sup>, Dlx5/6:Cre, Ai3* mutants and *Erk1<sup>-/-</sup>, Erk2<sup>fl/wt</sup>, Dlx5/6:Cre, Ai3* controls labeled for ERK2. Reduced ERK2 protein expression was detected throughout the striatum (D, yellow arrowhead) and in mutant CINs (E, yellow arrowheads) as compared to controls (n=3). **(G-L)** P14 coronal sections of *Erk1<sup>-/-</sup>, Erk2<sup>fl/fl</sup>, Dlx5/6:Cre, Ai3* and *Erk1<sup>-/-</sup>, Erk2<sup>fl/wt</sup>, Dlx5/6:Cre, Ai3* sensory cortices immunolabeled for PV showed no qualitative decrease in the number of fluorescently-labeled CINs (n=3).

### Figure S4. Related to Figure 4

**(A-D)** Representative confocal micrographs of the E17.5 developing cortical plate. A significant decrease in the number of RFP<sup>+</sup> CINs was detected in *caMek1 Slc32A1:Cre* embryos (quantification in **E**: n = 3; mean ± SEM, \* = p < 0.05).

*Figure S5. Related to Figure 5*

**(A-B)** *CaMek1 Slc32A1:Cre* mice (n = 25 control, 13 mutant) were assessed for locomotor, anxiety-like behaviors, and sociability in the open field task. No significant differences in distance traveled or center time were observed throughout 10 min of open field testing. **(C-E)** Elevated plus maze testing did not detect a significant difference in % open arm entries or % time spent in open arms. **(F-H)** In the social approach assay mutants did not significantly differ from controls in total entries, time spent in the social side, or social side entries.

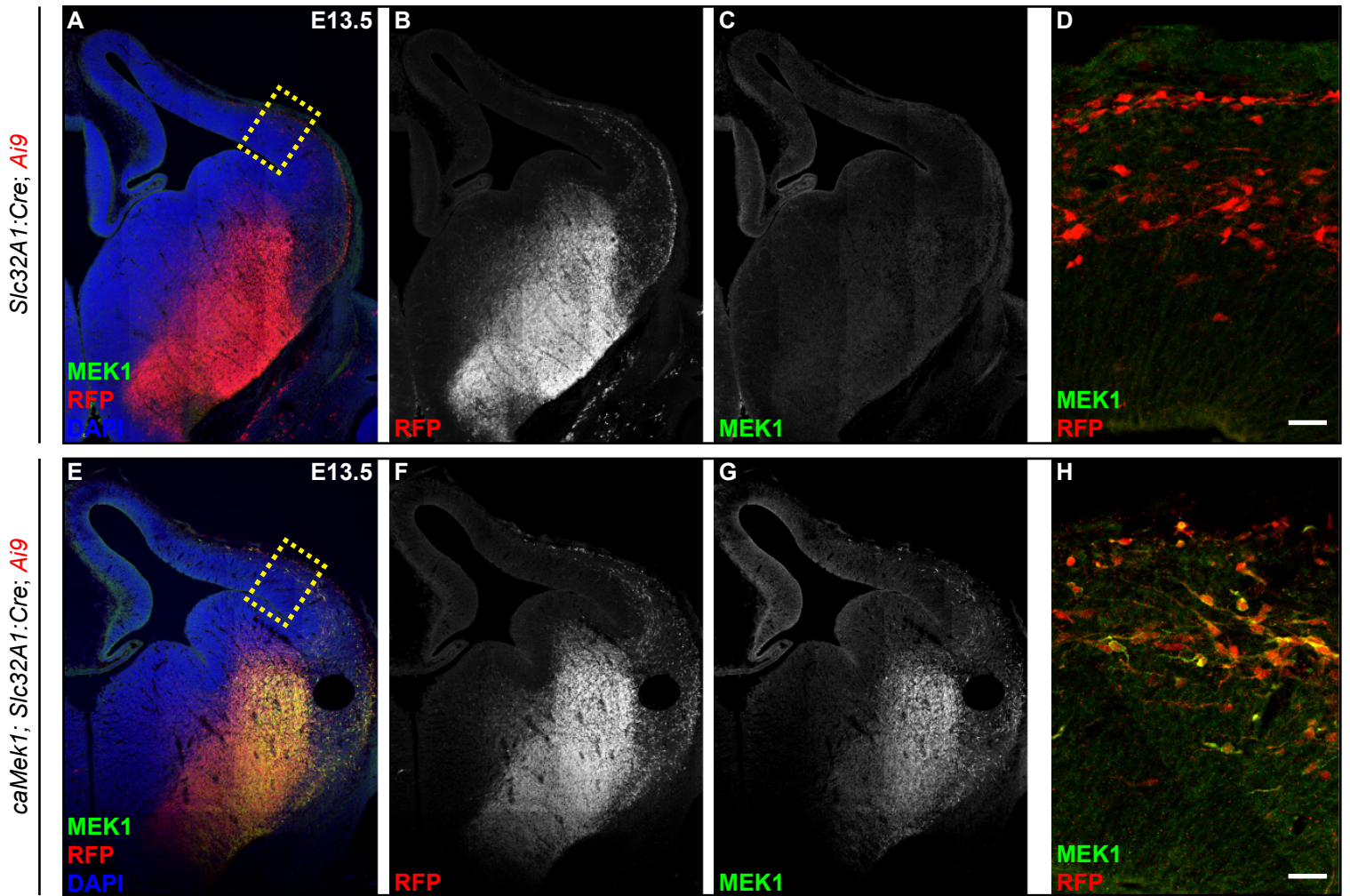
*Supplemental Video 1.*

Representative video montages of two control and two *caMek1 Slc32A1:Cre* mutants that showed abnormal rearing, neck twitching, and hypolocomotion during the first 60 seconds of the open field task.

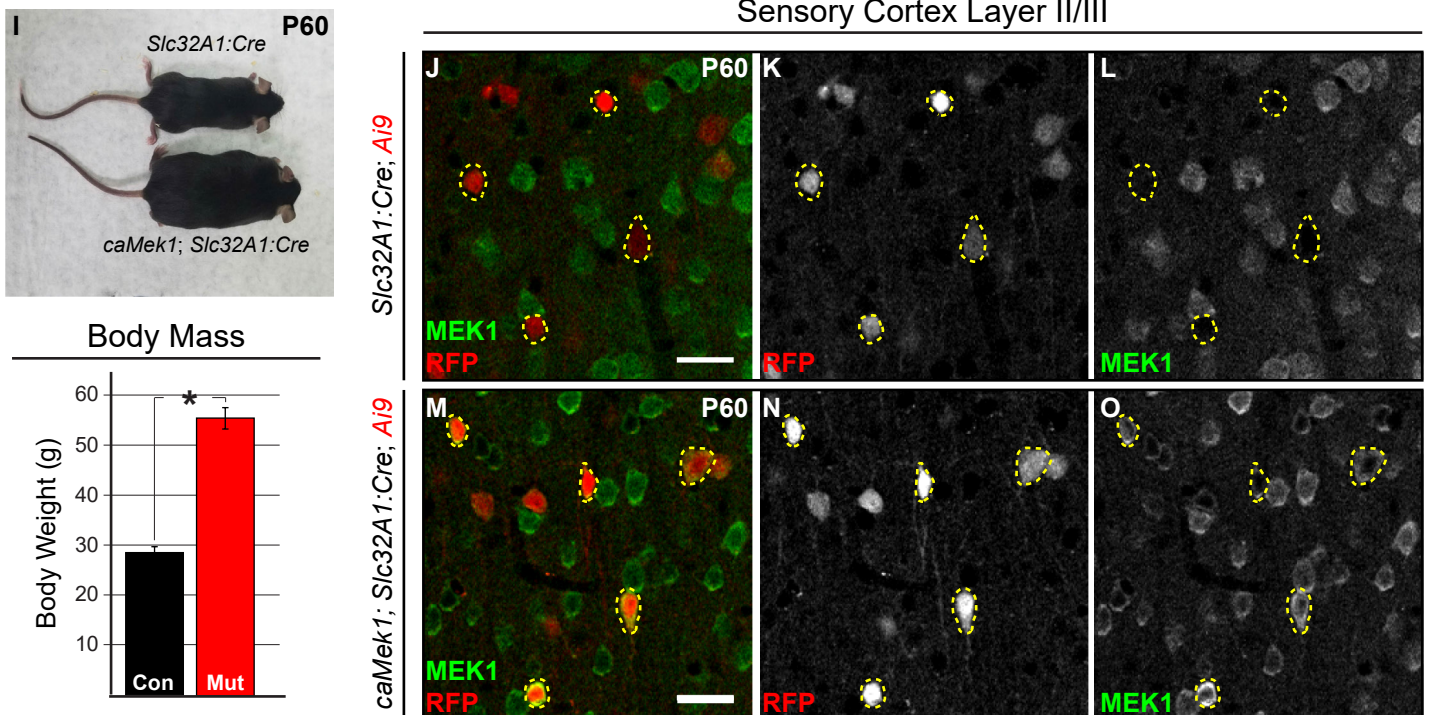
*Supplemental Video 2.*

Representative video montages of three control and three *caMek1 Slc32A1:Cre* mutants that underwent sudden behavioral arrest, abnormal head twitching, or motionless staring during the first 60 seconds of the open field task.

Developing Embryonic Forebrain



Sensory Cortex Layer II/III



Primary Somatosensory Cortex

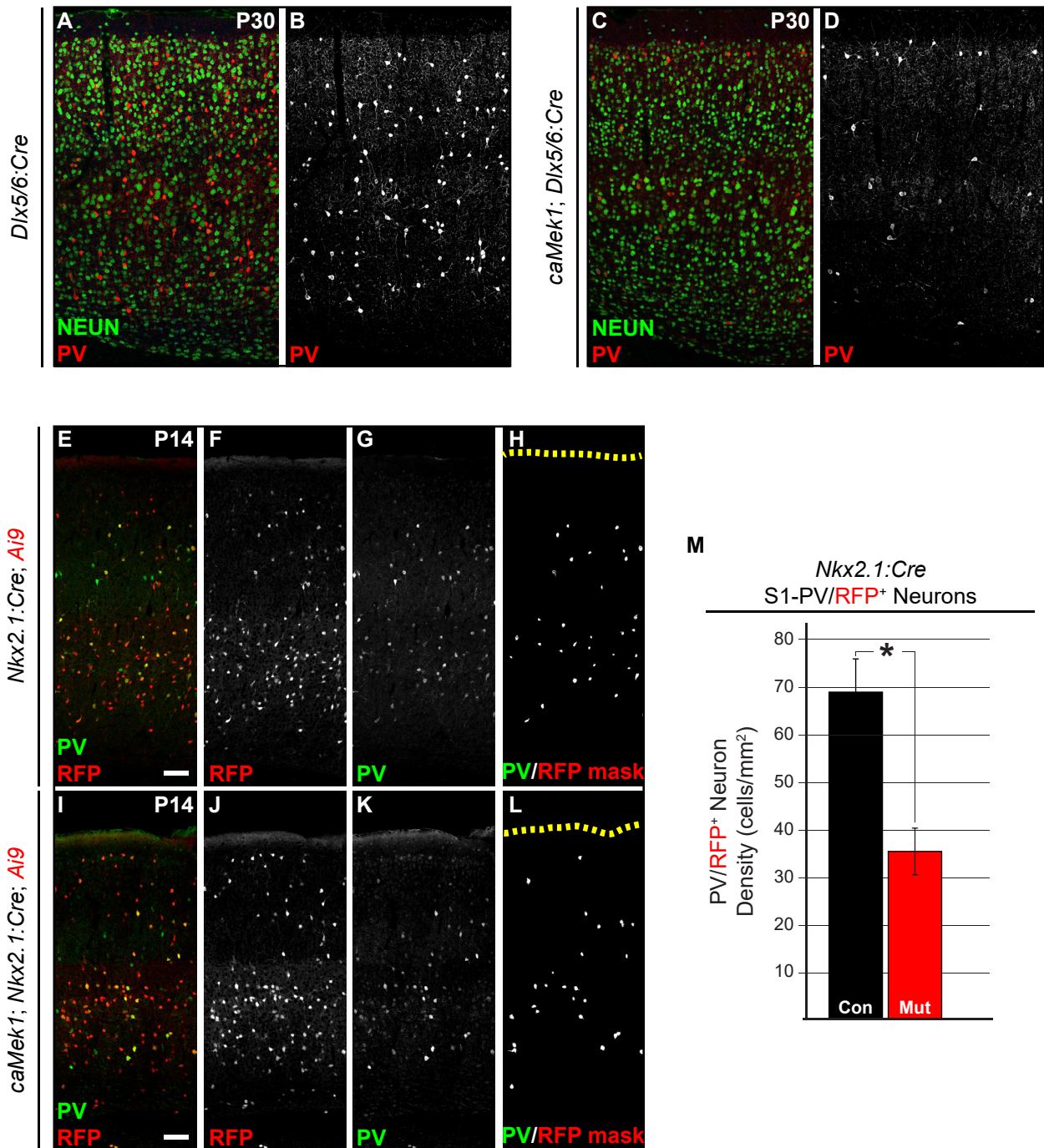
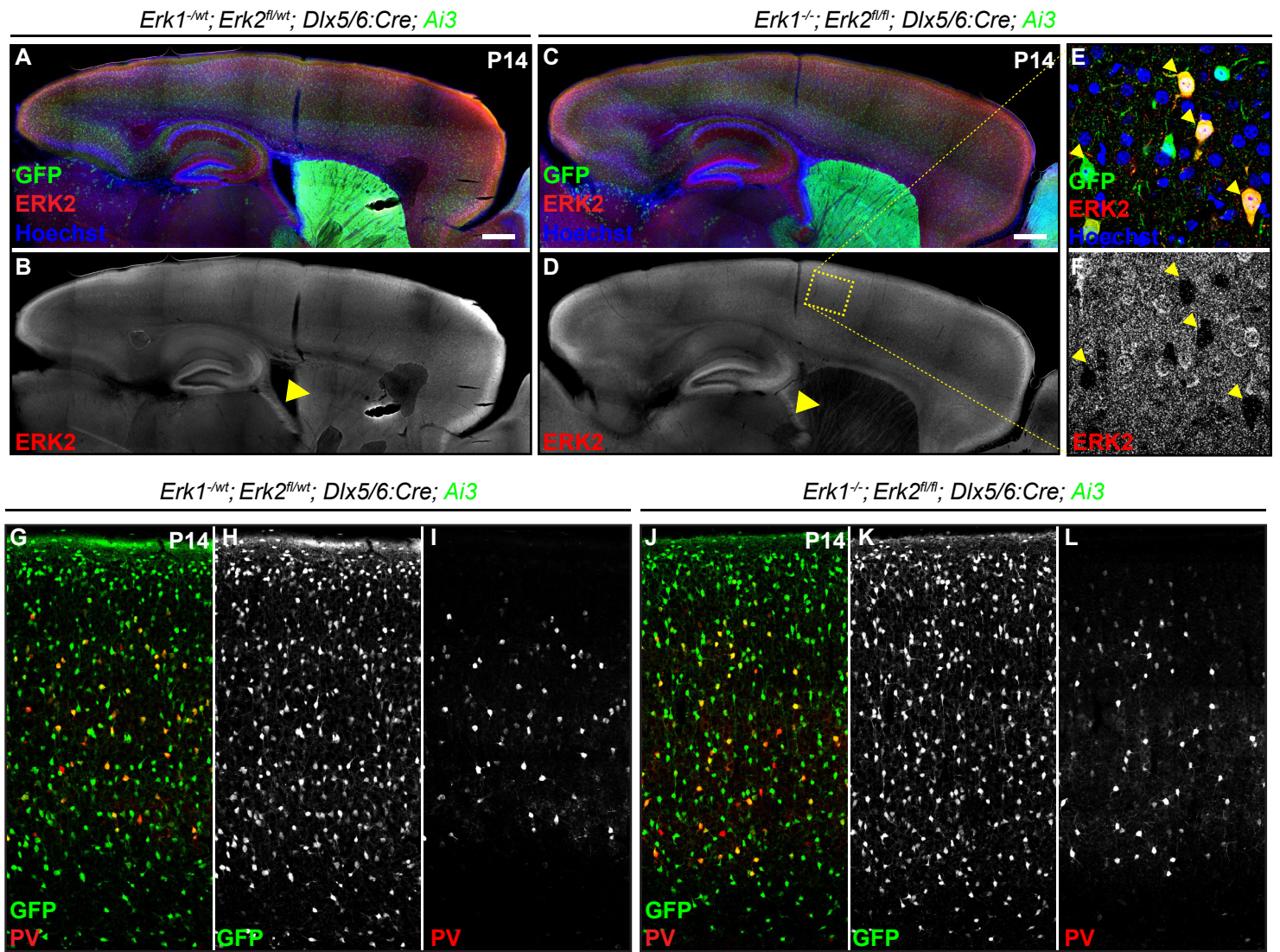


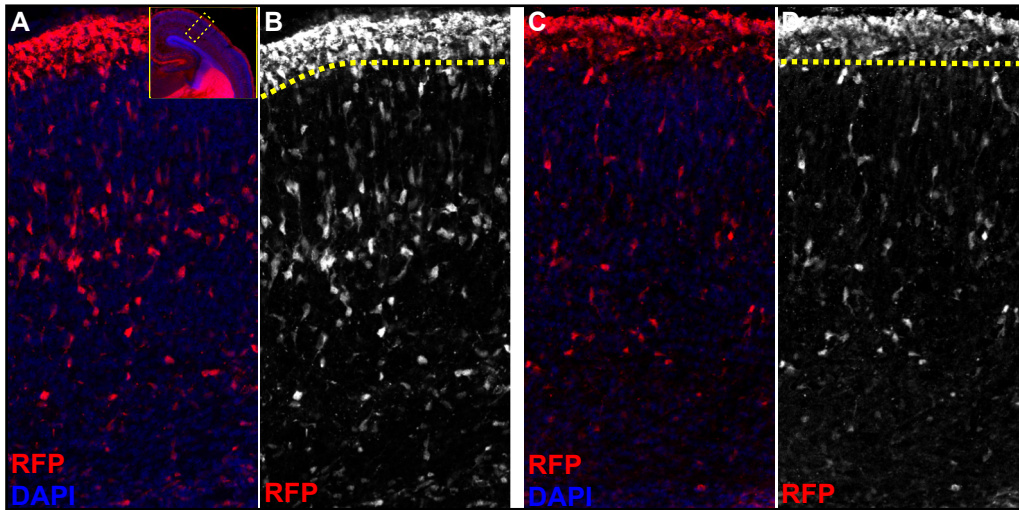
Figure S3



E17.5 Cortical Plate

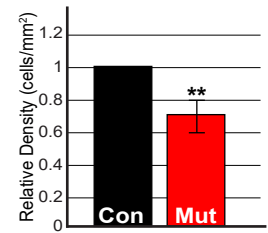
*Slc32A1:Cre; Ai9*

*caMek1; Slc32A1:Cre; Ai9*

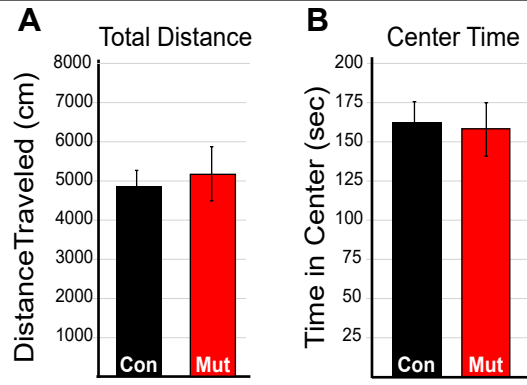


**E**

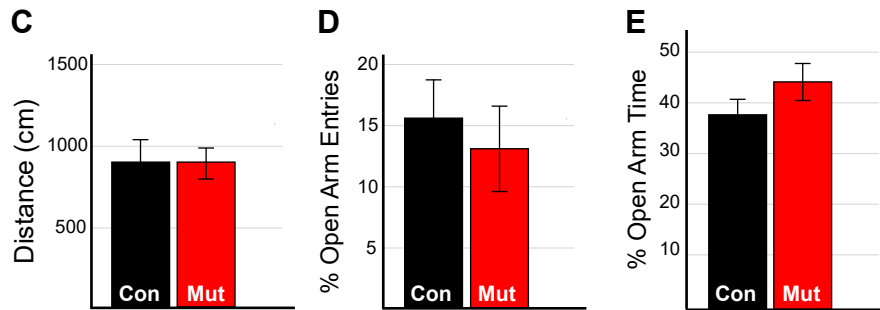
E17.5 Cortical Plate  
GABAergic Neurons



Adult Open Field



Elevated Plus Maze



Social Approach

