Supplemental Information (Figures S1-5).

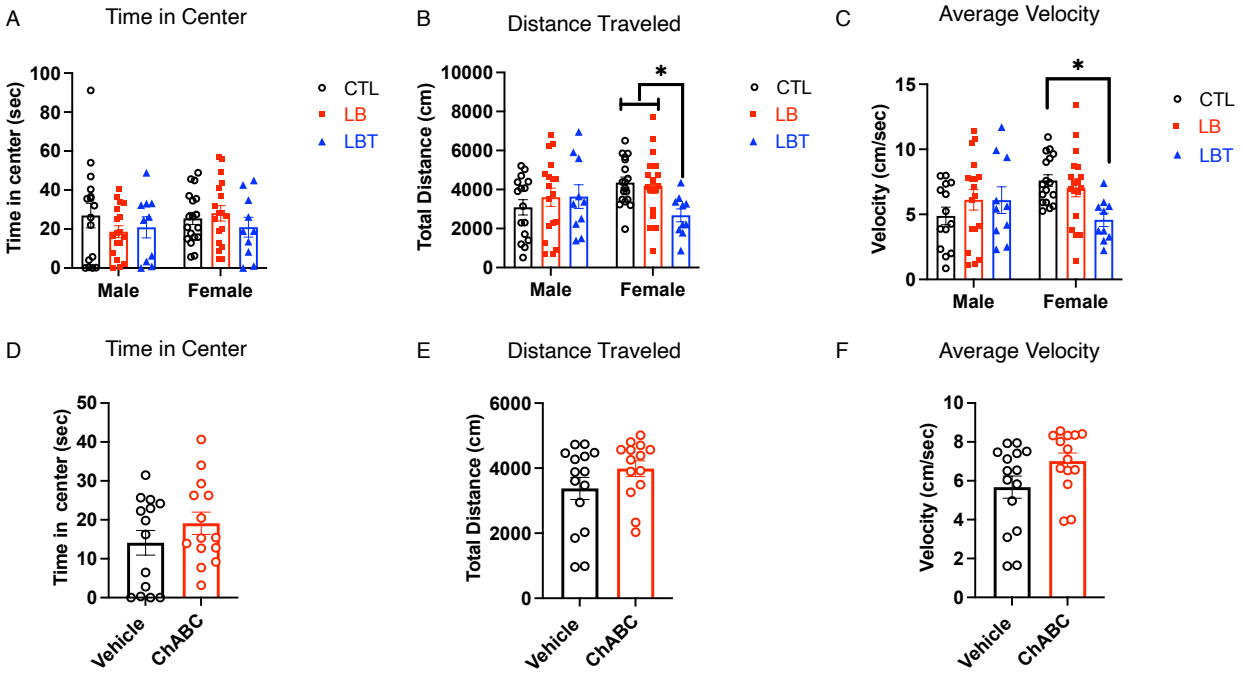

Fig S1. Exploratory Behavior in the Open Field. Effects of rearing conditions (A-C) and PNN degradation in the OFC (D-E). **A**. Time in the center, rearing: F (2, 84) = 0.61, P=0.54, sex: F (1, 84) = 0.50, P=0.48, interaction: F (2, 84) = 0.98, P= 0.38. **B**. Distance traveled, rearing: F (2, 84) = 1.39, P=0.25, sex: F (1, 84) = 0.73, P= 0.39, interaction: F (2, 84) = 3.00, P= 0.054. Post-hoc analysis males: CTL vs. LB: P= 0.62, CTL vs. LBT: P= 0.67, LB vs. LBT: P= 0.99. Post-hoc analysis females: CTL vs. LB: P= 0.96, CTL vs LBT: P= 0.027, LB vs. LBT: P= 0.049. **C**. Velocity, rearing: F (2, 81) = 1.38, P= 0.26, sex: F (1, 81) = 1.42, P= 0.23, interaction: F (2, 81) = 3.75. P=0.028. Post-hoc analysis males: CTL vs. LB: P= 0.41, CTL vs. LBT: P= 0.52, LB vs. LBT: P= 0.99. Post-hoc analysis females: CTL vs. LB: P= 0.81, CTL vs. LBT: P= 0.017, LB vs. LBT: P= 0.059. **D**. Time in center, t(26)= 1.17, P= 0.25. **E**. Distance traveled, t(27)= 1.43, P= 0.16. **F.** Velocity, t(27)= 1.88, P= 0.07. A-C, two-way ANOVA, CTL males n=18, CTL females n= 18, LB males n= 18, LB females n=18, LBT males n=10, LBT females n=10. From 7-9 different litters per group. D-F, student-t-tests, Vehicle n= 15, ChABC n=14, all males.

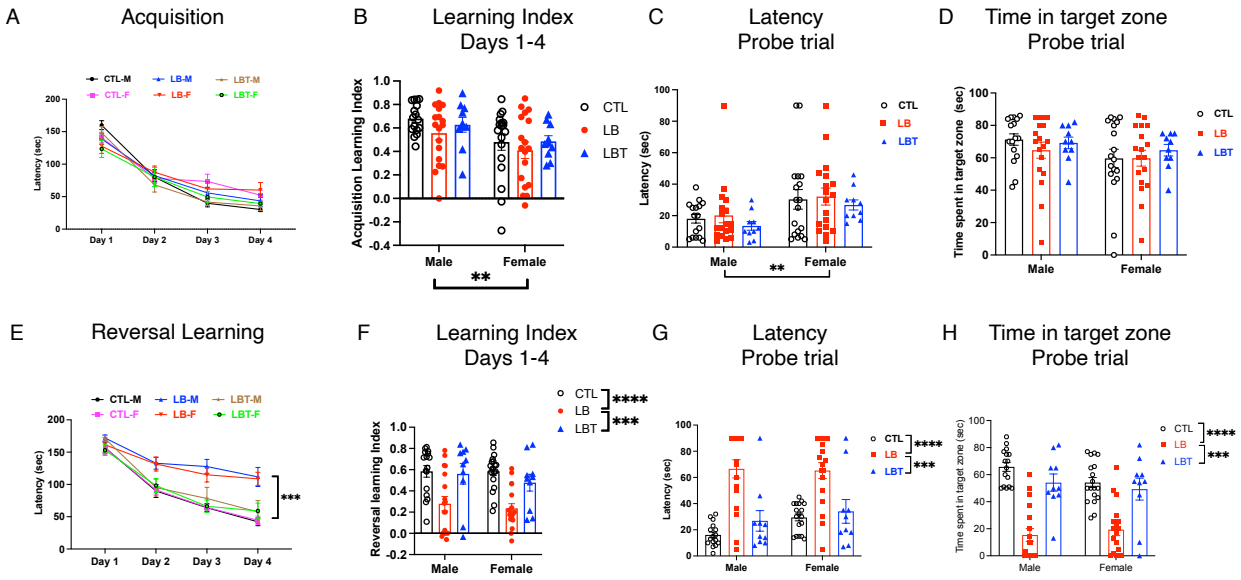

Fig S2. Effects of Rearing and Sex on Acquisition Phase (A-D) and Reversal Learning (E-H). This is the same data shown in Figure 1 except that outcomes in males and females are shown separately. **A**. Acquisition (latency) days 1-4. rmANOVA, days: $F(2.4, 204.4)= 214$, $P< 0.001$, rearing: $F(2,84)= 0.45$, $P= 0.81$, sex: $F(1,84)= 0.52$, $P= 0.47$, interaction: $F(2,84)= 0.17$, $P= 0.84$. **B**. Acquisition (Learning Index) days 1-4. ANOVA, rearing $F (2, 84) = 1.50$, $P=0.23$, sex $F (1, 84) = 9.55$, $P= 0.0027$, interaction: $F (2, 84) = 0.14$, $P=0.86$. **C**. Acquisition (probe trial) latency to escape. ANOVA, rearing $F (2, 84) = 0.62$, $P= 0.53$, sex: $F (1, 84) = 8.92$, $P= 0.0037$, interaction: $F (2, 84) = 0.008$, $P= 0.99$.**D**. Acquisition (probe trial) time in target zone. ANOVA, rearing $F (2, 84) = 0.46$, $P= 0.62$, sex: $F (1, 84) = 2.91$, $P= 0.092$, interaction: $F (2, 84) = 0.34$, $P= 0.71$. **E**. Reversal learning (latency) days 1-4. rmANOVA, days: $F(2.35, 195.17)= 164.21$, $P< 0.001$, rearing: $F(2,83)= 20.62$, $P< 0.001$, sex: $F(1,83)= 0.27$, $P= 0.60$, interaction: $F(2,83)= 0.12$, $P= 088$. Post-hoc. CTL vs. LB: $P< 0.001$, LBT vs. LB: $P< 0.001$, CTL vs. LBT: $P= 0.58$. **F**. Reversal learning (Learning Index) days 1-4. ANOVA, rearing $F (2, 84) = 18.40$, $P< 0.000$, sex: $F (1, 84) = 0.67$, $P= 0.41$, interaction: $F (2, 84) = 0.21$, $P= 0.81$. Post-hoc. CTL vs. LB: $P <0.0001$, LBT vs. LB: $P= 0.0004$, CTL vs. LBT: $P= 0.69$. **G**. Reversal learning (probe trial) latency to escape. ANOVA, rearing $F (2, 84) = 35.86$, $P< 0.0001$, sex: $F (1, 84) = 1.75$, $P= 0.18$, interaction: $F (2, 84) = 0.95$, $P= 0.39$. Post-hoc. CTL vs. LB: $P <0.0001$, LBT vs. LB: $P <0.0001$, CTL vs. LBT: $P= 0.44$. **H**. Reversal learning (probe trial) time in target zone. Rearing $F (2, 84) = 50.20$ $P<0.0001$, sex: $F (1, 84) = 1.047$ $P=0.30$, interaction $F (2, 84) = 1.536$ $P=0.22$. Post-hoc Sidak. CTL-LB $P <0.0001$, LBT-LB $P <0.0001$, CTL-LBT $P= 0.2607$. **N**. Schematic illustration of maze during reversal learning. CTL males n=18, CTL females n= 18, LB males n= 18, LB females n=18, LBT males n=10, LBT females n=10. From 7-9 different litters per group.

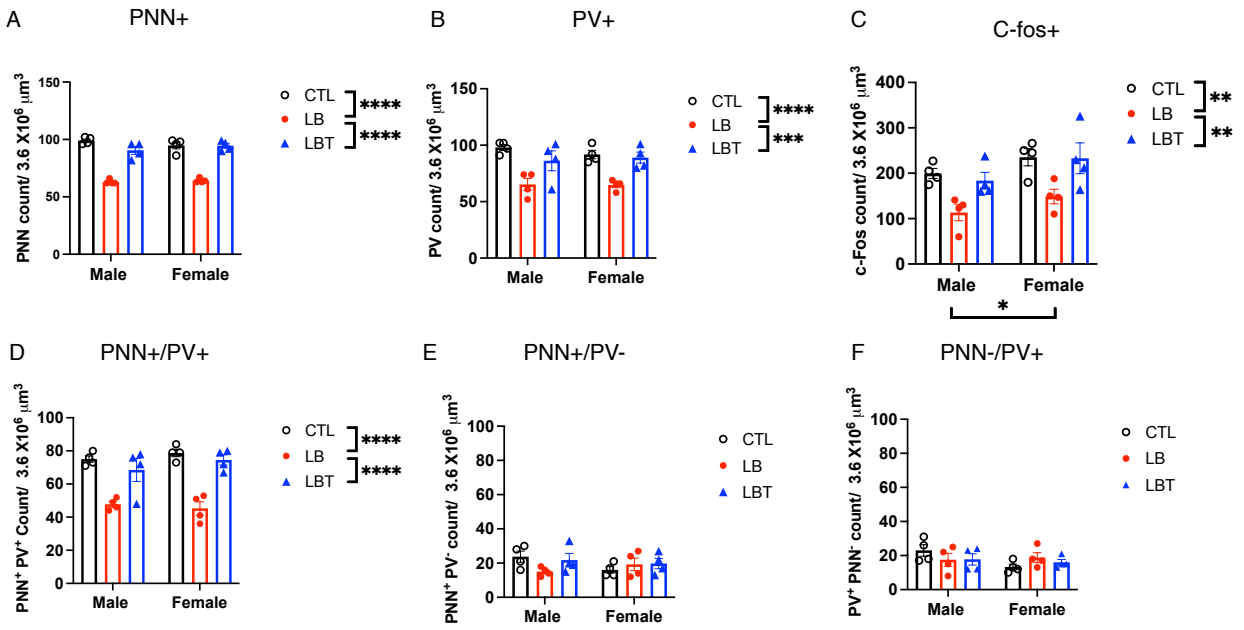

Fig S3. Effects of Rearing and Sex on PNN Formation in the OFC. This is the same data shown in Figure 2 except that outcomes in males and females are shown separately here. Postnatal Enrichment Mitigates Deficits in PNN Formation and Neuronal activation in the OFC of LB Mice **A**. PNN+ cell density. ANOVA, rearing: F (2,18) = 135.3, P< 0.0001, sex: F (1,18) = 0.034, P=0.85, interaction: F (2,18) = 1.83, P= 0.19. Post-hoc, CTL vs. LB: P< 0.0001, LBT vs. LB: P< 0.0001, CTL vs. LBT: P= 0.17. **B**. PV+ cell density. ANOVA, rearing: F (2,18) = 18.55, P< 0.0001, sex: F (1,18) = 0.10, P= 0.75, interaction: F (2,18) = 0.39, P= 0.67. Post-hoc, CTL vs. LB: P< 0.0001, LBT vs. LB: P= 0.0009, CTL vs. LBT: P= 0.35. **C**. c-fos+ cell density. ANOVA, rearing: F (2,18) = 10.54, P= 0.0009, sex: F (1,18) = 5.65, P= 0.029, interaction: F (2,18) = 0.074, P= 0.93. Post-hoc, CTL vs. LB: P= 0.0017, LBT vs. LB: P= 0.0045, CTL vs. LBT: P= 0.96. **D**. PNN+PV+ cell density. ANOVA, rearing: F (2,18) = 36.65, P< 0.0001, sex: F (1,18) = 0.61, P= 0.44, interaction: F (2,18) = 0.67, P= 0.52. Post-hoc, CTL vs. LB: P< 0.0001, LBT vs. LB: P< 0.0001, CTL vs. LBT: P= 0.35. **E**. PNN+PV- cell density. ANOVA, rearing: F (2,18) = 0.79, P= 0.46, sex: F (1,18) = 0.56, P= 0.46, interaction: F (2,18) = 2.01, P= 0.16. **F**. PNN-PV+ cell density. ANOVA, rearing: F (2,18) = 0.12, P= 0.88, sex: F (1,18) = 2.05, P= 0.17, interaction: F (2,18) = 1.89, P= 0.18. N=4 per rearing and sex group.

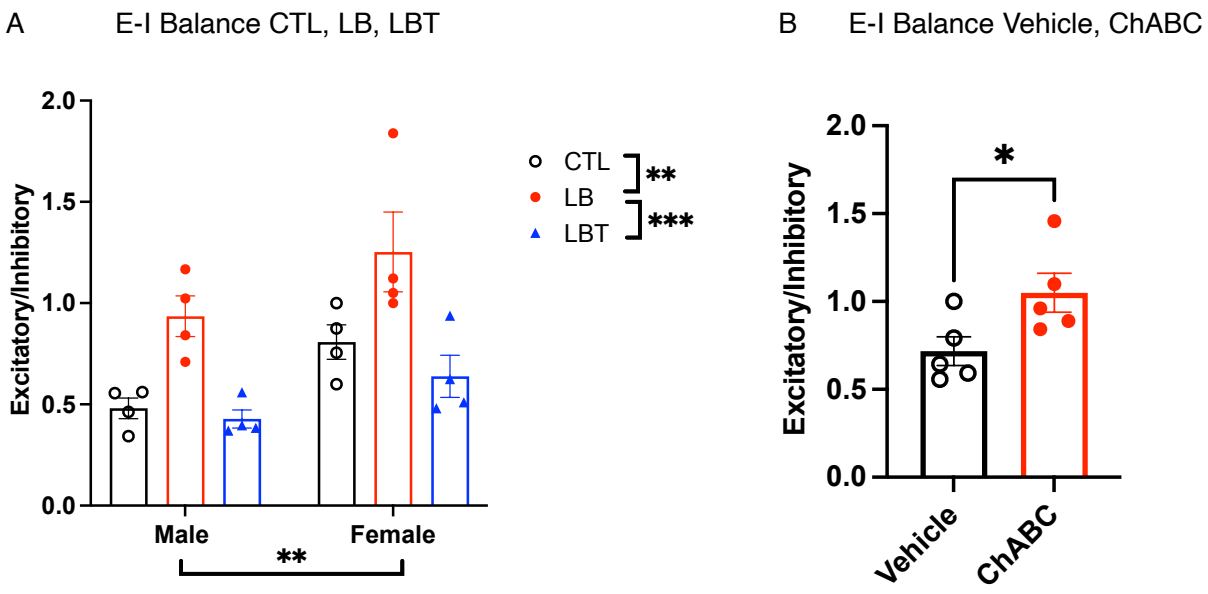

Fig S4. Effects of Rearing and PNN Degradation on the Ratio Between Excitatory and Inhibitory Synapses in the OFC. A. Postnatal enrichment normalizes E-I balance in the OFC, rearing: F (2, 18) = 14.78, P=0.0002, sex: F (1, 18) = 10.21, P=0.0050, interaction: F (2, 18) = 0.17, P= 0.84. Post-hoc Tukey's-HSD: CTL vs. LB: P= 0.0018, LBT vs. LB: P= 0.0002, CTL vs. LBT: P= 0.58. **B**. PNN degradation in the OFC increases E-I balance to levels observed in LB mice, t(8)= 2.42, P= 0.042.

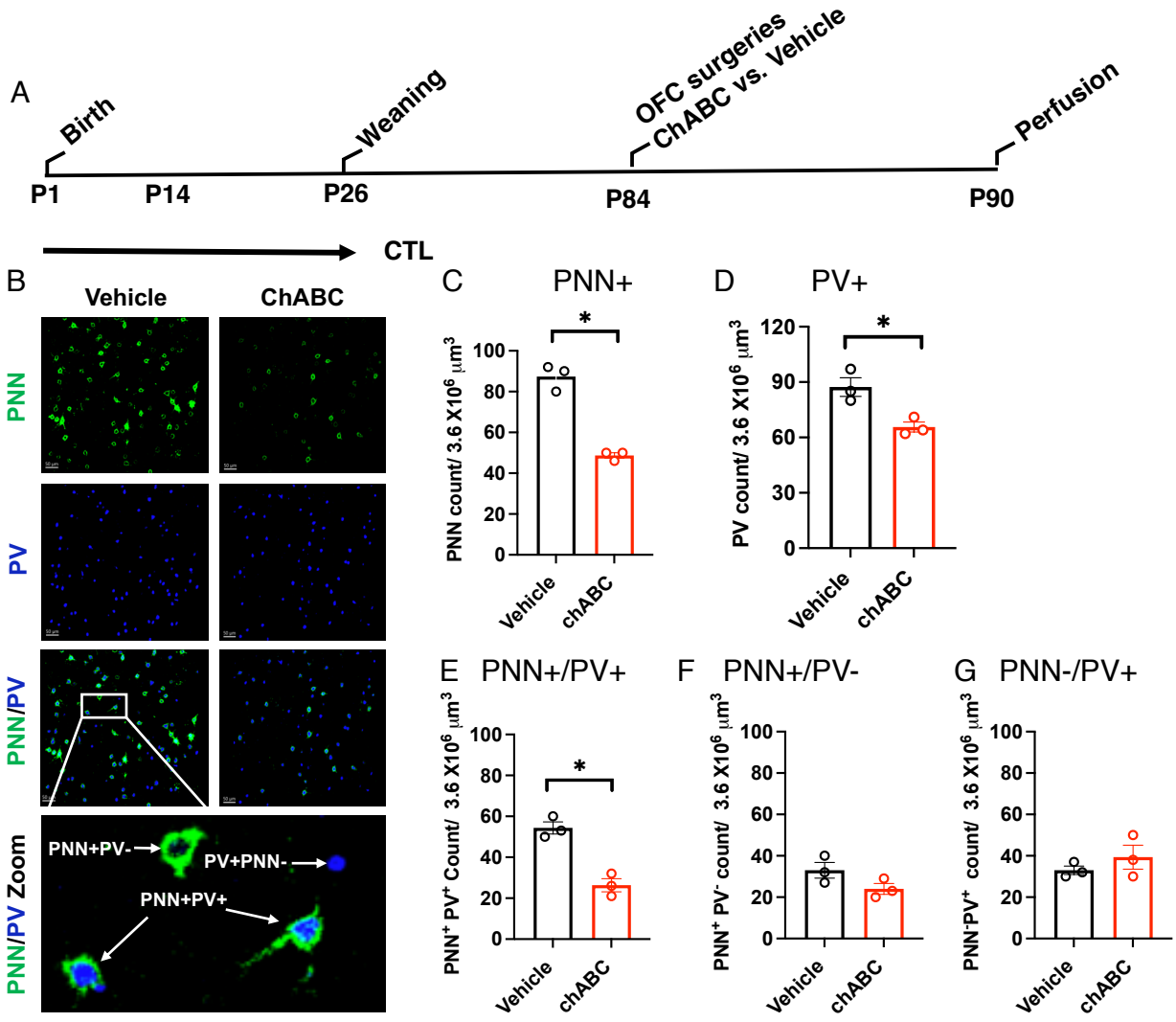

Fig S5. ChABC Treatment Reduces PNN+PV+ Cell Density in the OFC. A. Three adult Balb/cByj were administered ChABC into the right hemisphere and vehicle into the left hemisphere. Mice were sacrificed 7-days later to quantify levels of PNN+, PV+, PNN+PV+, PNN+PV-, and PNN-PV+ cells in the OFC (**B-G**). ChABC reduced the densities of PNN+ cells (**C**, t(2)= 8.29, P= 0.014), PV+ cells (**D**, t(2)= 7.31, P= 0.018) and PNN+PV+ cells (**E**, (2)= 7.39, P= 0.018), but did not alter the densities of PNN+PV- cells (**F**, t(2)= 3.58, P= 0.07) or PNN-PV+ cells (**G**, t(2)= 0.91, P= 0.45). Paired student-t-tests C-G.