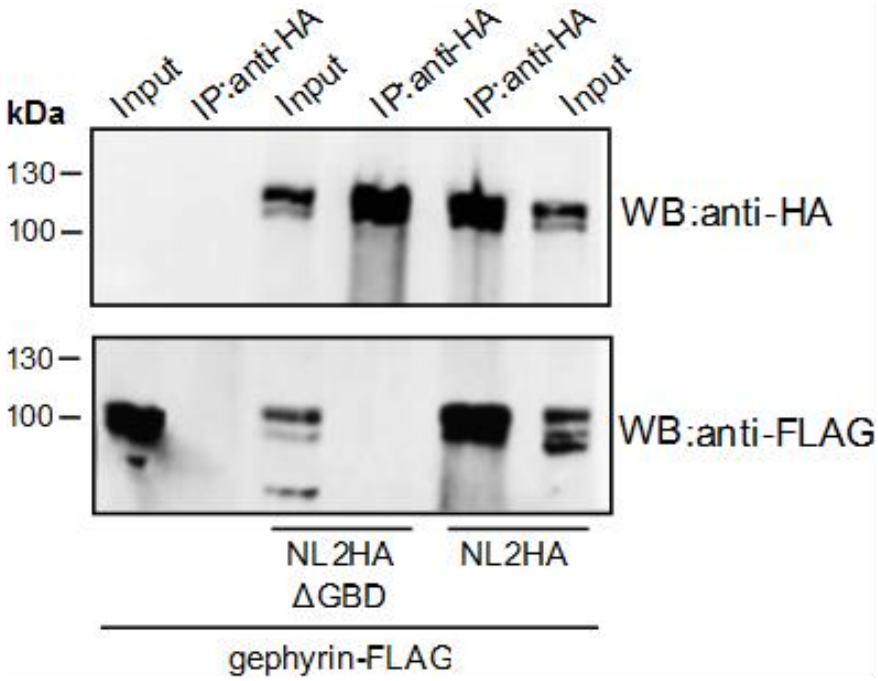
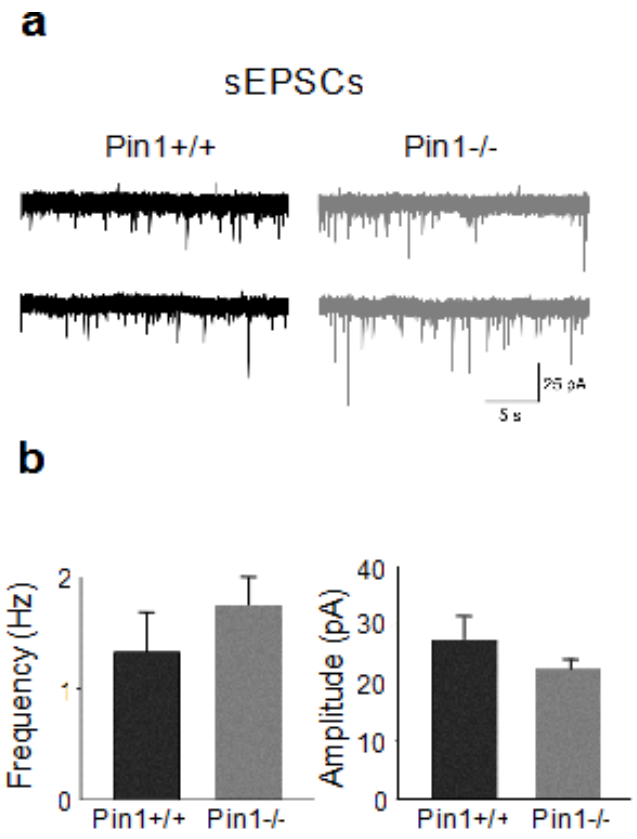
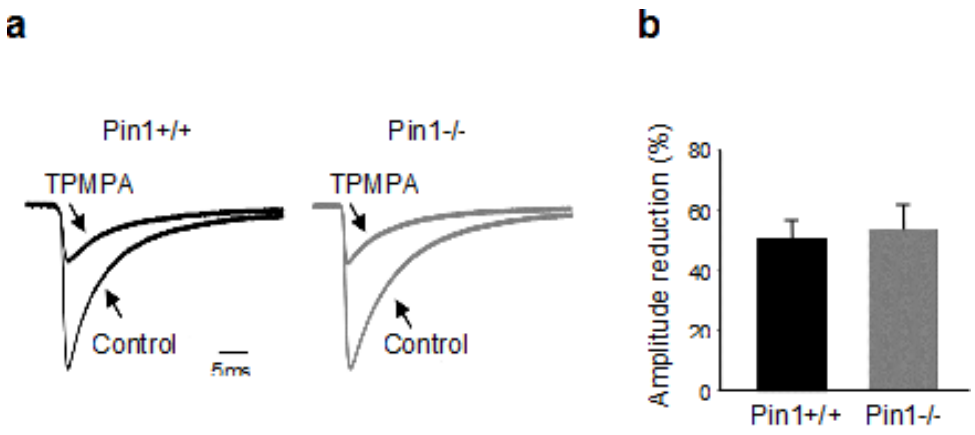
Supplementary Information



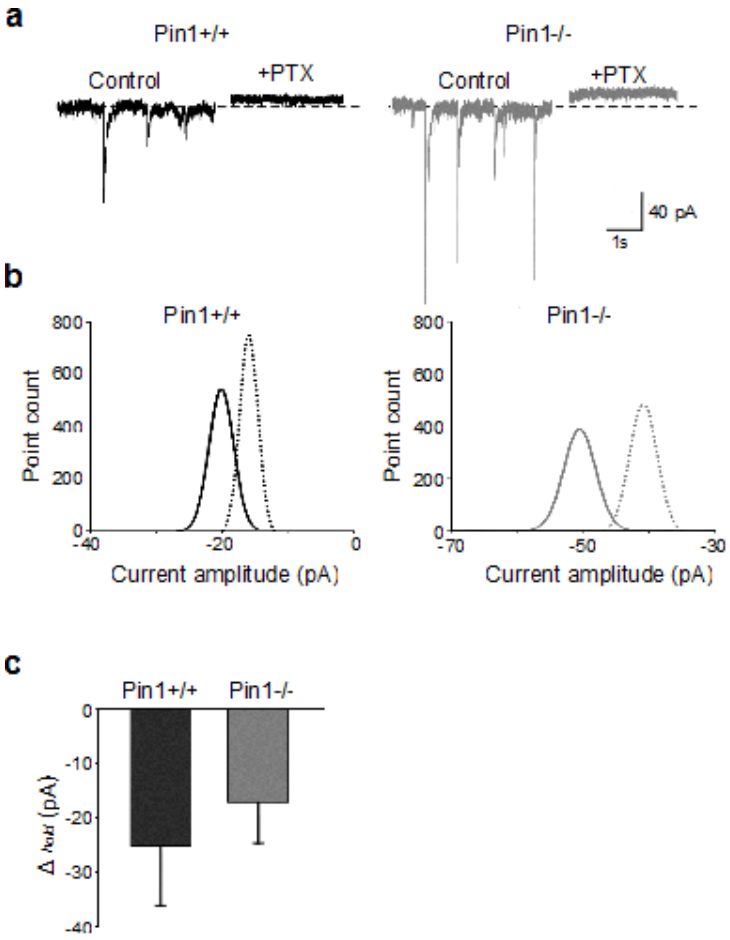
Supplementary Figure 1. NL2 lacking the gephyrin binding domain does not interact with gephyrin. Representative IP of HA epitopes from samples of HEK293 cells co-expressing gephyrin-FLAG and NL2HA or NL2HA-ΔGBD. IP was also performed on gephyrin-FLAG single transfected cells as a negative control. Nitrocellulose membranes were probed with anti-HA and anti-FLAG antibodies. Gephyrin-FLAG interaction with NL2HA is completely abolished upon removal of the GBD.



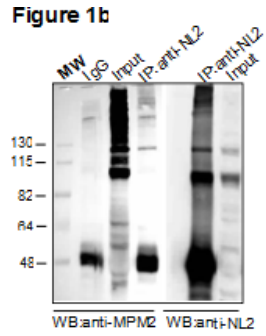
Supplementary Figure 2. Pin1 does not affect the amplitude or frequency of sEPSCs. **a)** Samples traces of sEPSCs recorded in the presence of the $GABA_A$ receptor antagonist PTX 100 μM from a CA1 principal cells at P11 in hippocampal slices from Pin1+/+ (black) and Pin1-/- mice (gray), n=6 for both genotypes. **b)** Each column represents the mean frequency and amplitude values of sEPSCs recorded from WT (black, n=6) and Pin-/- mice (gray, n= 6). $P > 0.05$, Student's *t*-test.

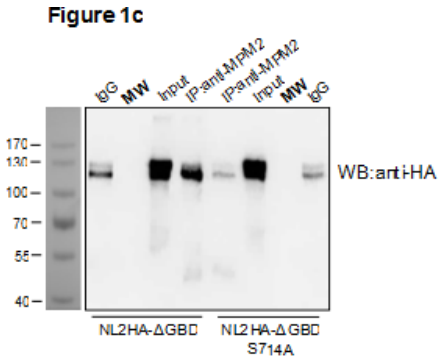


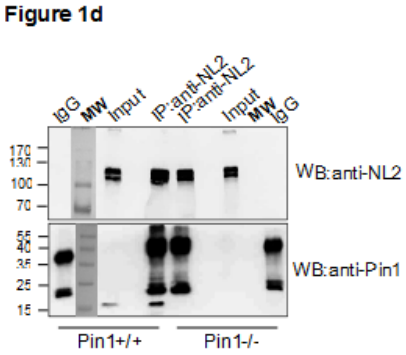
Supplementary Figure 3. Pin1 does not affect GABA transient in the cleft. a) Sample traces of sIPSCs recorded from Pin1+/+ (black) and Pin1-/- mice (gray), in the absence (Control) and in the presence of TPMPA (200 μM). The amplitudes of sIPSCs from Pin1-/- mice were normalized to those obtained from control littermates. **b**) Each column represents the mean TPMPA-induced reduction of sIPSCs amplitude in Pin1+/+ (black; n=4) and Pin1-/- mice (gray; n=5). $P > 0.05$; one-way ANOVA and Bonferroni post test for multi comparison analysis between groups

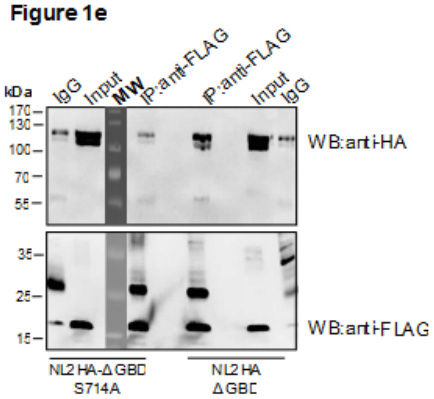


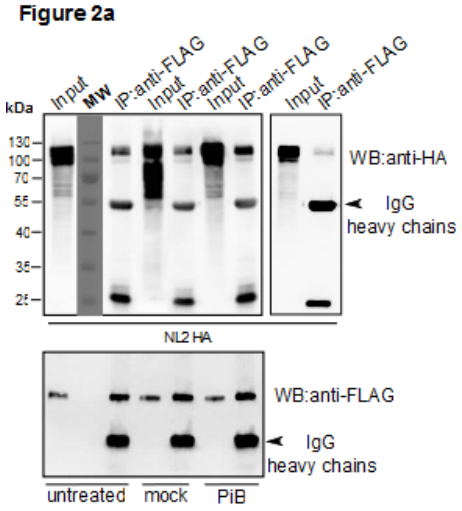
Supplementary Figure 4. Pin does not affect extrasynaptic $GABA_A$ Receptors. a) Representative traces of spontaneous IPSCs recorded from a CA1 pyramidal cell in hippocampal slice obtained from Pin1+/+ (black) and Pin1-/- mice (gray) before and during application of picrotoxin (PTX, 100 μM). **b)** All-point histogram of 5 ms traces from the cells recorded in a, before (dotted lines) and during (continuous lines) bath application of PTX in Pin1+/+ (black) and Pin1-/- mice (gray). Pin1+/+ n=6 and Pin1-/- mice n= 7. $P > 0.05$, Mann-Whitney test **. c)** Summary data of tonic currents obtained from both genotyping.

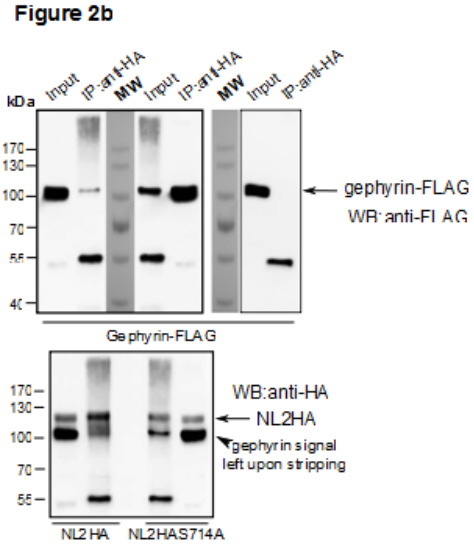












Supplementary Figure 5. Full images of western blot displayed in cropped format in figures 1, 2, 3, 4 and 5 (continued below)

Figure 2c

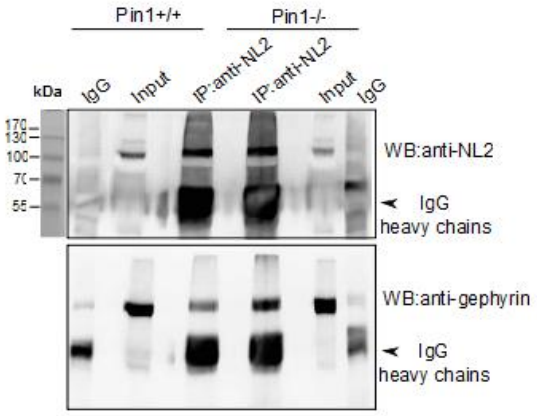


Figure 2d

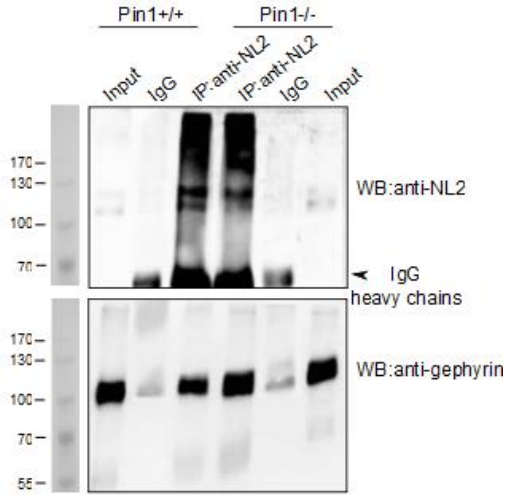


Figure 3c

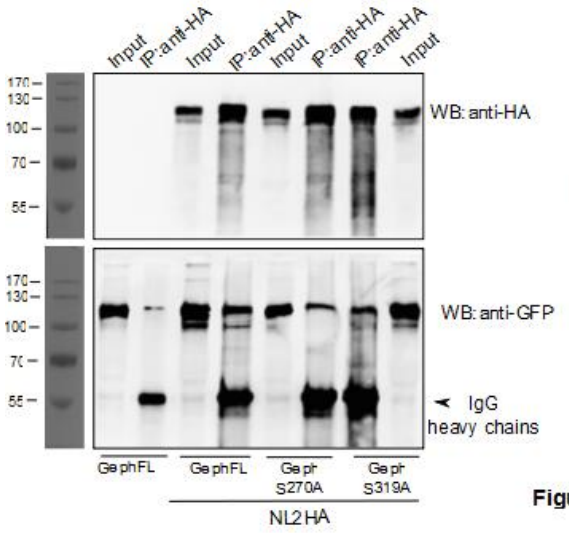


Figure 4a

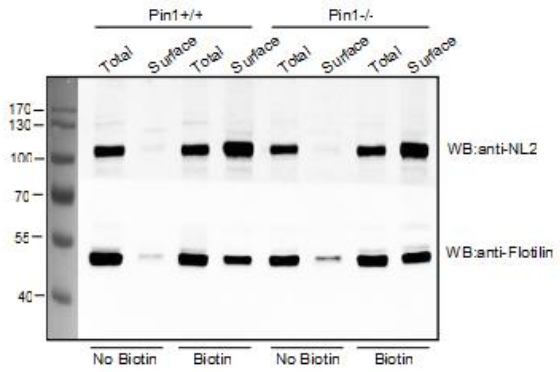


Figure 5a