

SUPPLEMENTARY FIGURES

Supplementary Fig. 1 | MD(1) does not affect parameters of persistent Pyr->PV synapses.

Synaptic parameters were estimated from the responses to 50 Hz trains (10 pulses). **a**, Superimposed traces show an example of 15 consecutive trials (gray) along with averaged response (black). Scale bars: 50 mV, 10 pA, 20 ms. **b**, The attenuation of the responses (normalized to the first response) during the train was comparable in pairs from NR (white circles) and D (black circles) mice (two-way: ANOVA $F[1, 230]=9.097$, $p=0.0028$; interaction $F[9, 230]=0.65$, $p=0.757$). **c**, The example illustrates how the quantal size (Q), determined from the initial slope of the plot of mean uEPSC amplitude vs variance (see methods for details). **d**, Q was not different in pairs from NR and D mice (MW-test $U=74$, $p=0.893$) **e**, the example illustrates how the linear relationship between the cumulative uEPSC amplitude vs stimulus number was used to estimate the readily releasable pool (RRP) size (intercept) and replenishment rate (slope) (Schneggenburger et al., 1999) (see methods for details). **f,g**, MD(1) did not affect either the RRP size (**f**: MW-test $U=60$, $p=0.4284$) or the RRP replenishment rate (**g**, MW-test $U=72$, $p=0.892$). In addition, MD(1) did not affect the paired-pulse ratio (P2/P1) of the responses (**h**: MW-test $U=240$, $p=0.583$), the uEPSC failure rate (**i**: MW-test $U=192$, $p=0.2861$) or the coefficient of variation (CV) of the responses (**j**: MW-test $U=185$, $p=0.2136$). The number of cells or cell pairs and mice is indicated in parenthesis in **b-f**.

Supplementary Fig. 2 | MD(1) does not affect the synaptic output of PV-Ins. **a-c**,

Maximal IPSCs (IPSC_{max}) in L2/3s. **a**, IPSCs were evoked by electrical stimulation delivered ~100 μ m lateral to cell body. **b**, the IPSC_{max} was determined from the responses to stimuli series of increasing intensity. **c**, IPSC_{max} was not different in PVs from NR and D mice (MW-test $U=375$, $p=0.7854$). **d-g**, MD(1) does not affect the PV→Pyr connectivity. **d**, shows an example of uIPSCs (individuals: gray; average: black) evoked in a pyramidal cell (Pyr) by PV firing. **e**, comparable connection probability in pairs from NR and D mice (F-test $p>0.9999$). **f**, uIPSC amplitude in connected pairs from NR and D mice (MW-test $U=153$, $p=0.4675$). **g**, uIPSC paired pulse ratio (PPR: 100 ms interval) in connected pairs from NR and D mice (t-test $F[31.5]=1.782$, $p=0.0843$).

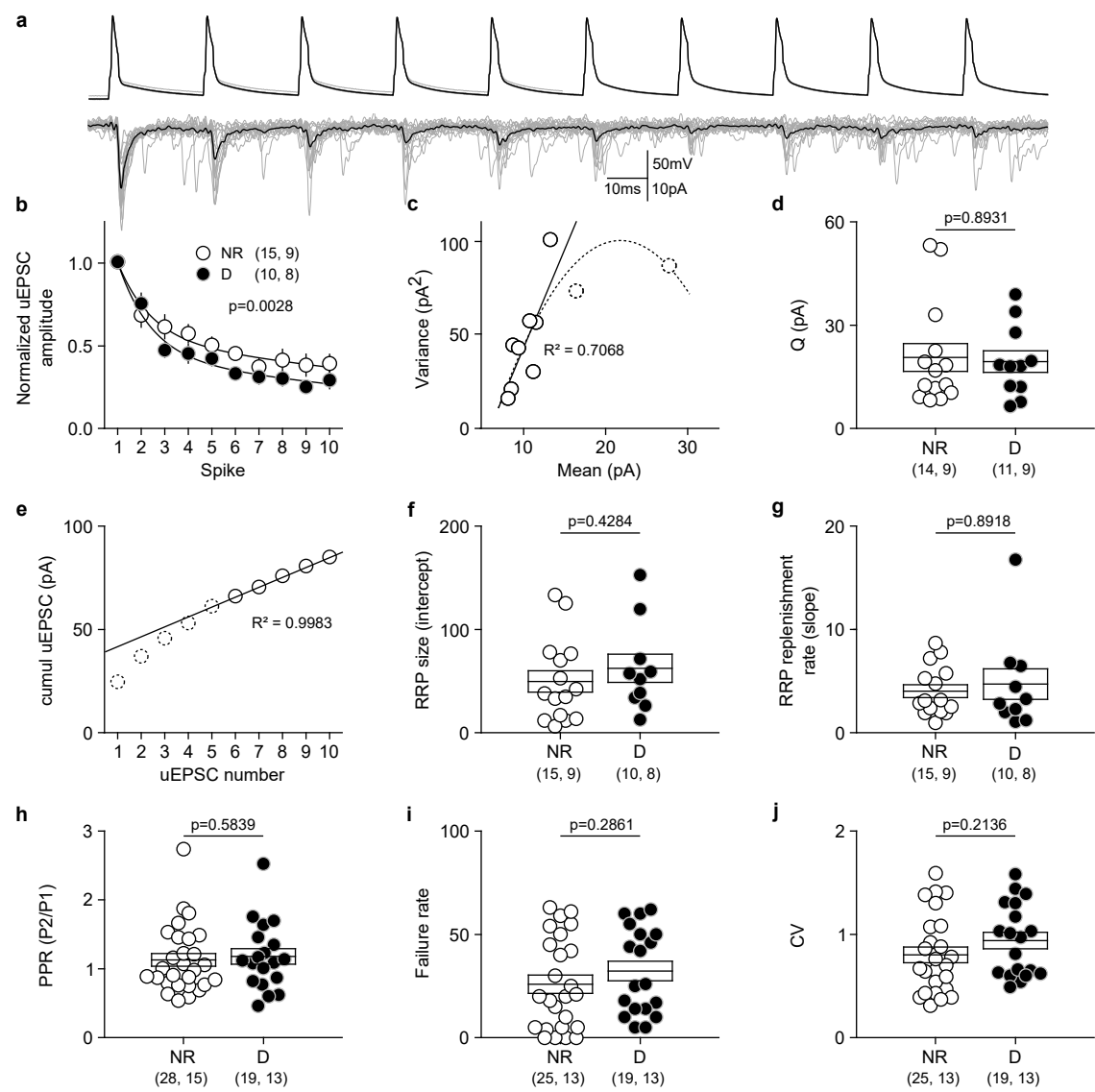
Supplementary Fig. 3 | Localization of V1 with intrinsic signal imaging for the analysis of NPTX2-SEP. **a**, The epifluorescence image of the cranial window. The

black box area defines the site for performance of two-photon microscopy. **b-d**, Altitude, azimuth and sign map of the visual responses reveals the V1 region. The grids and arrows in **b,c** indicate the direction of visual stimulation.

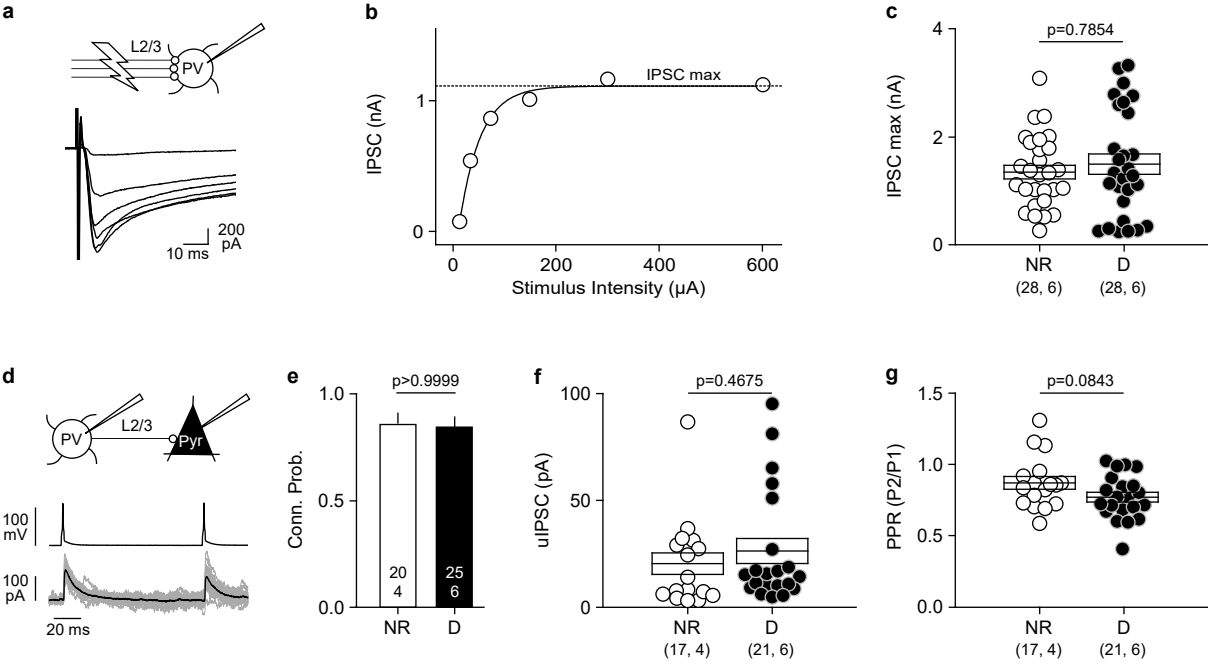
Supplementary Fig. 4 | Reduced NPTX2 protein content in V1 after MD(1). Western blot analysis of NPTX2 expression in the non-deprived (ND: open circle) and deprived (D: black circles) V1 of mice after 1 day of MD. NPTX2 levels were normalized to β -actin through densitometry analysis. Left, example experiment. Right; the grey lines connect data from individual mice. Circles connected by the thick line represent mean \pm SEM. Wilcoxon test $W=-26$, $p=0.0313$.

Supplementary Fig. 5 | Confirmation of viral transfection with AAV2-CaMKII-NPTX2-SEP and AAV2-CaMKII-dnNPTX2-EGFP. **a**, AAV-CaMKII-NPTX2-SEP was injected into the visual cortex of PV-Cre;Ai14(tdTomato) new-born mice (p0-2). After 3-4 weeks the effect of over expressed NPTX-SEP on Pyr→PV-IN connectivity and ODP were assessed. Expression of NPXT2-SEP in proximity of PV somas was confirmed post hoc by confocal microscopy. **b**, AAV-CaMKII-dnNPTX2-EGFP was injected into the same line of adult mice (p80-114). After 3-4 weeks the effect of dnNPTX2 on connectivity and ODP were assessed. The expression of dnNPTX2-EGFP was detected in the slices with simple fluorescence.

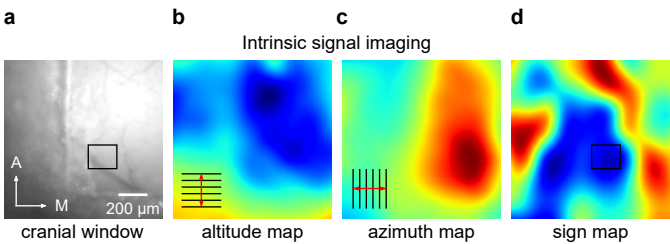
Supplementary figure 1 (Figure 1 related)



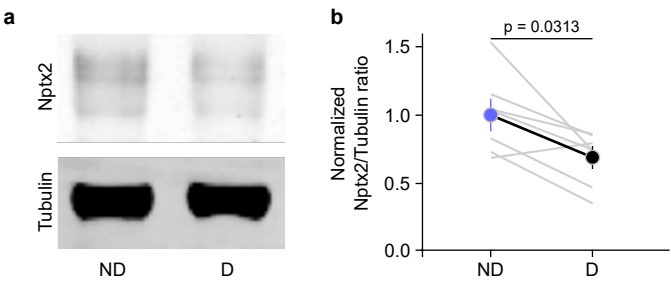
Supplementary Figure 2 (Figure 2 related)



Supplementary Figure 3 (Figure 5 related)



Supplementary Figure 4 (Figure 5 related)



Supplementary Figure 5 (Figure 6 related)

