SUPPLEMENTARY INFORMATION

A single fear-inducing stimulus induces a transcription-dependent switch in AMPA receptor phenotype

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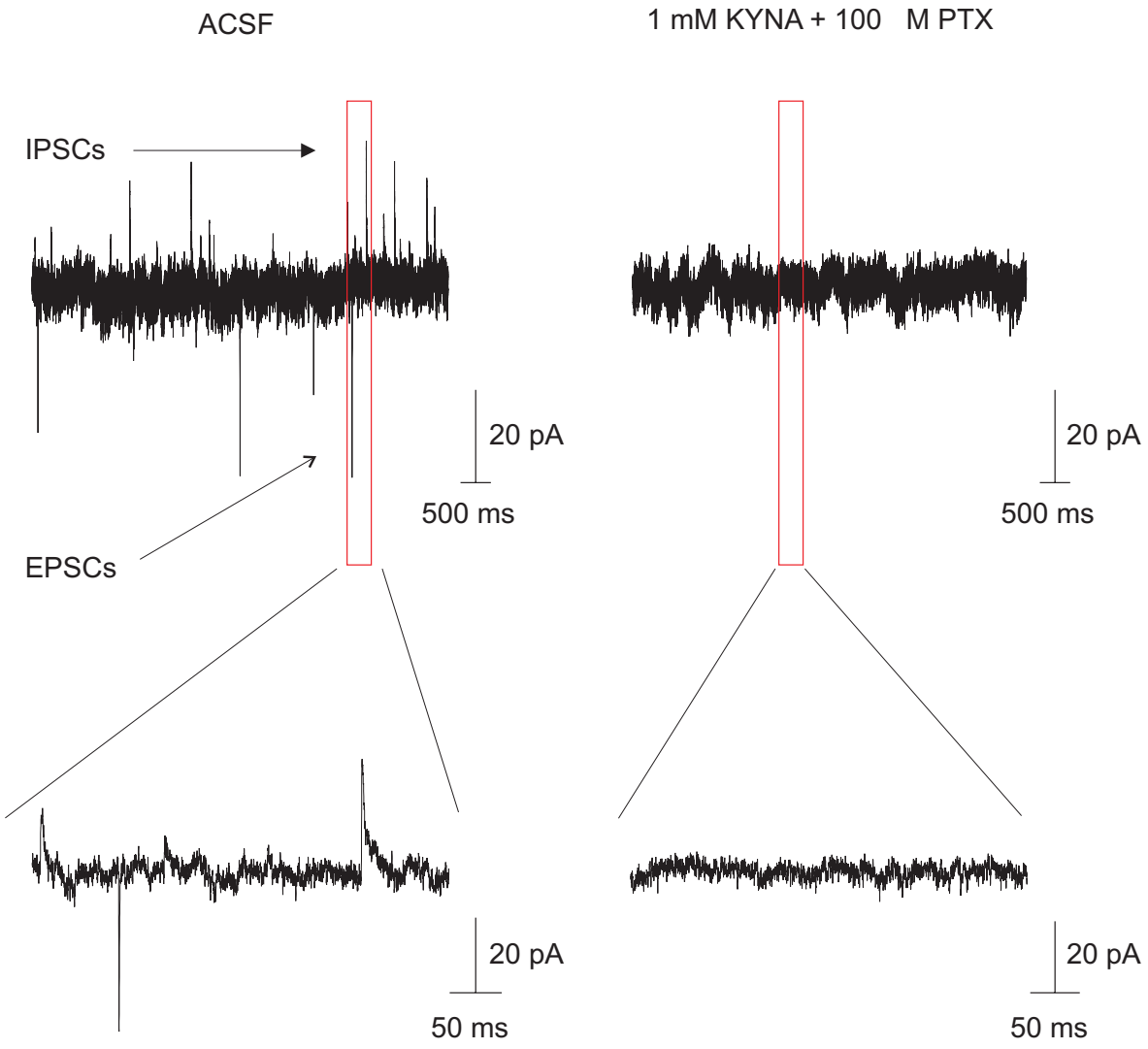
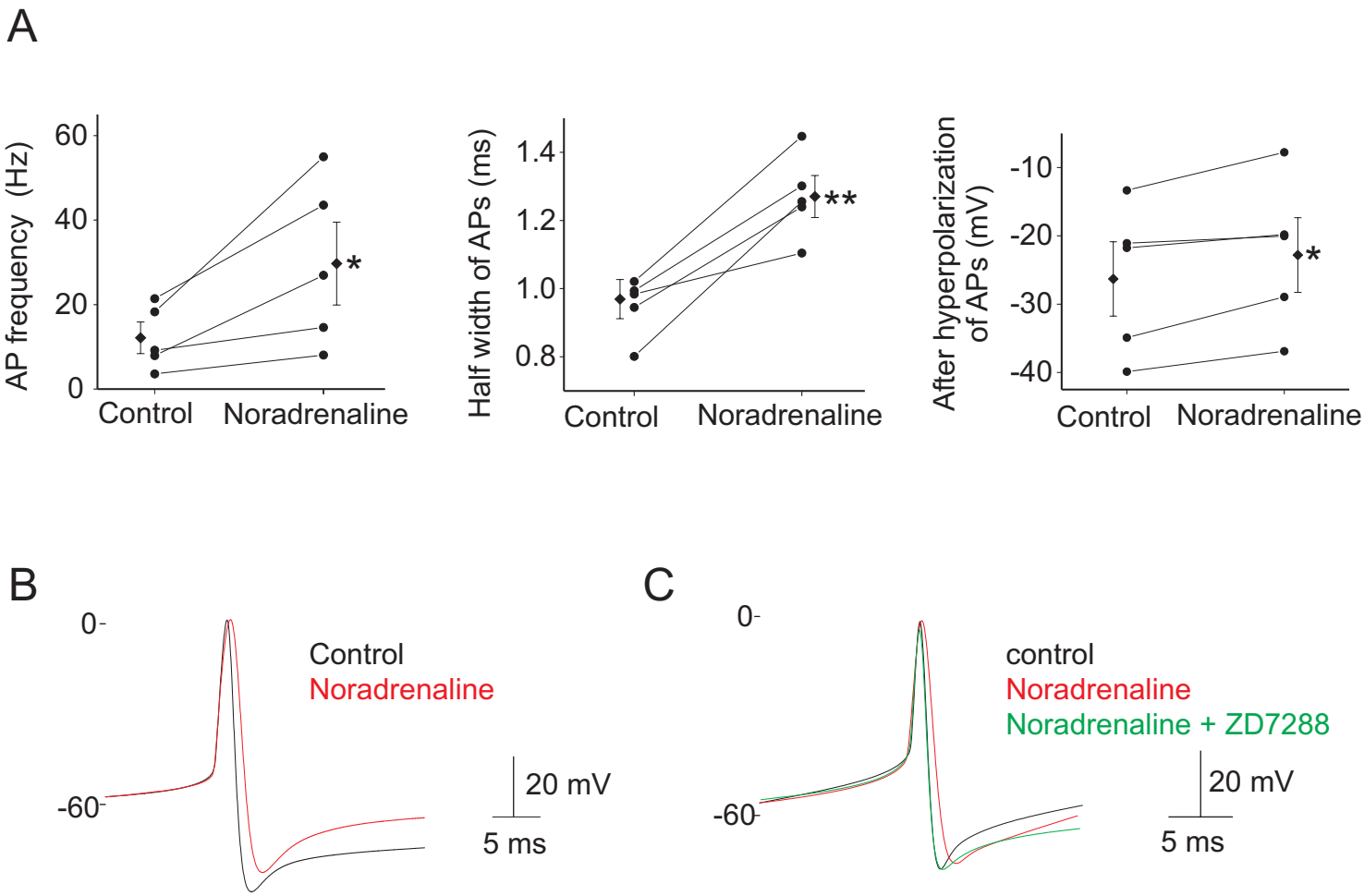
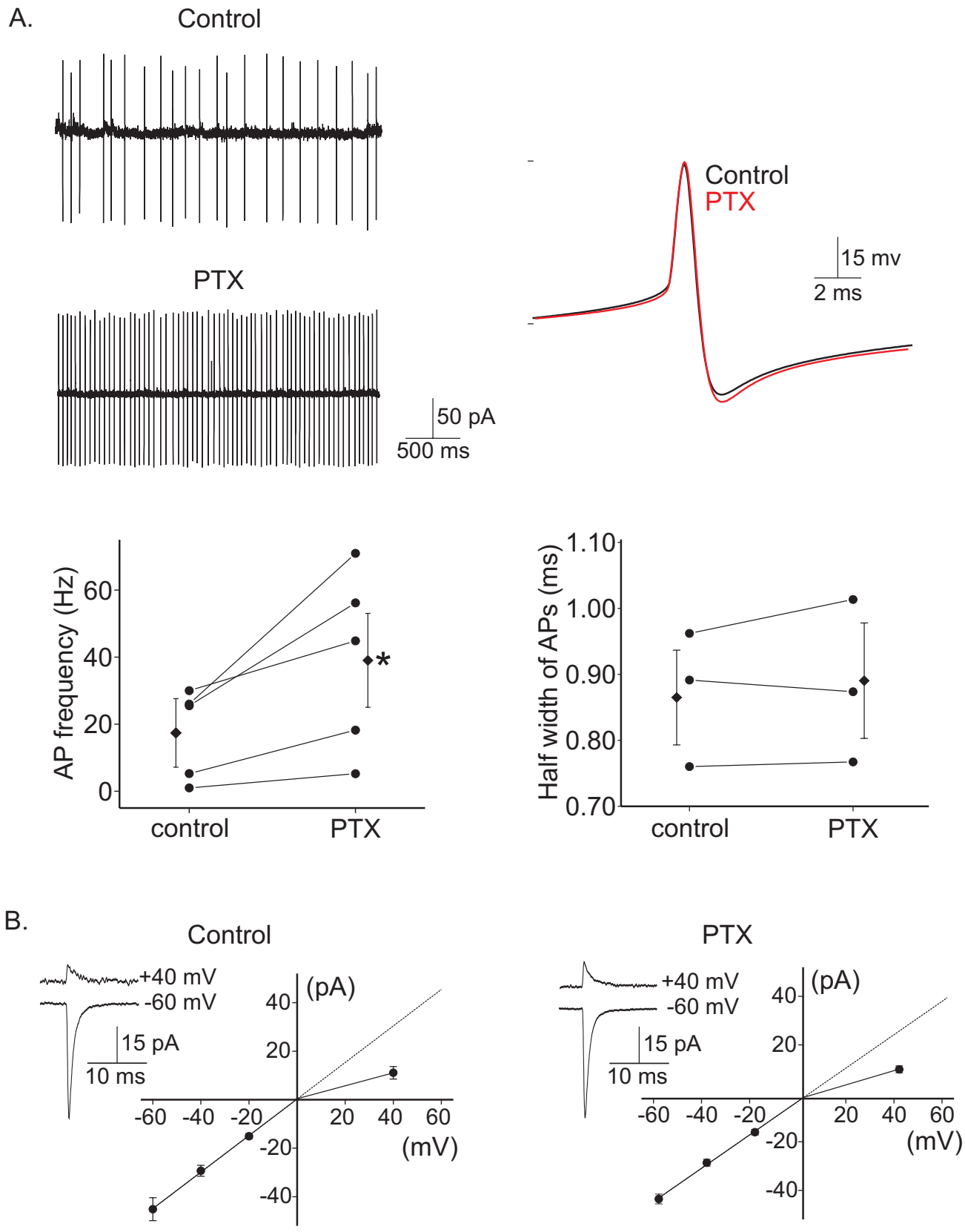


Supplementary Figure 1. **Kynurenic acid and picrotoxin blocked spontaneous synaptic currents.** Synaptic currents were recorded at -30 mV using a low Cl pipette solution. Outward currents were mediated by GABARs, and inward currents were mediated by glutamate receptors. Kynurenic acid (1 mM) and picrotoxin (100 μM) completely blocked both inward (excitatory) and outward (inhibitory) synaptic currents. The red rectangle indicates the region shown below.

Nature Neuroscience: doi:10.1038/nn.2474



Supplemental Figure 2. **Effect of noradrenaline on action potential firing**. **A.** Noradrenaline increased the frequency and the duration of spontaneous action potentials and reduced the size of the after-hyperpolarization at 36°C. (*, $P < 0.05$, and **, $P < 0.005$ by a paired t-test). **B.** An example illustrating that noradrenaline also increased the action potential duration at room temperature. **C.** ZD7288 (10 μM), an I(h) inhibitor, abolished the noradrenaline-induced spike broadening.



Supplementary Figure 3. Increasing action potential frequency by blocking inhibitory transmission did not alter sEPSC rectification. A. Picrotoxin (100 μM) enhanced the frequency of spontaneous action potential firing (n = 5) at 36°C, but did not alter the duration of action potentials. **B**. Following incubation with100 μM picrotoxin at 36°C for 3 hours, synaptic currents displayed an inwardly rectifying I-V relationship.

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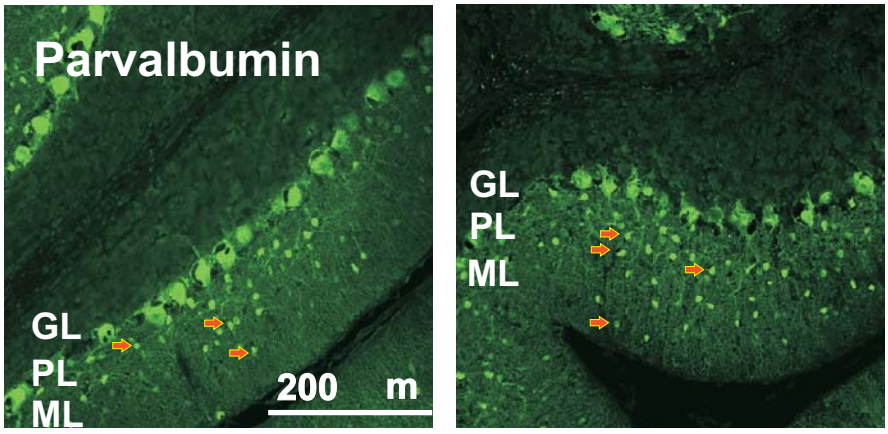

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Supplementary Figure 4. **Parvalbumin immunofluorescence in individual stellate cells**. Parvalbumin-positive interneurons are visible in the molecular layer (see arrows), where stellate cells are located. In slices stained by parvalbumin, Purkinje cell soma and dendrites are also labeled in the Purkinje cell layer and molecular layer, respectively. ML, molecular layer; PL, Purkinje cell layer; GL, granule cell layer.

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Supplementary Table 1. Effects of ZD7288 (10 μM), an I(h) inhibitor, on the noradrenaline (NA) -induced spike broadening in stellate cells.

	Control	ZD7288	Control	NA	NA + ZD7288
sAPs duration (ms)	1.00 ± 0.07	1.12 ± 0.04	0.93 ± 0.05	1.21 ± 0.07 *	0.95 ± 0.05 **
n	4	4	3	3	3

*, $P < 0.05$, *vs* control; **, $P < 0.01$, vs NA

Supplementary Table 2. Effects of picrotoxin (100 μM) on spontaneous action potentials (sAPs) and spontaneous excitatory post synaptic currents (sEPSCs).

	sAPs frequency (Hz)	sAPs duration (ms)	sAPs AHP (mV)	sEPSCs amplitude at –60 mV (pA)	sEPSCs amplitude at +40 mV (pA)	Rectification Index of sEPSCs
Control	17.5 ± 10.2	0.87 ± 0.07	–31.4 ± 7.5	–45.2 ± 4.7	11.1 ± 2.6	0.38 ± 0.09
Picrotoxin	39.1 ± 14.0 *	0.89 ± 0.09	–32.1 ± 4.1	–43.5 ± 2.0	9.9 ± 1.4	0.38 ± 0.06
n	5	3	3	5	5	5

*, $P < 0.05$, *vs* control.

Supplementary Table 3. Effects of 1 mM TEA on spontaneous action potentials (sAPs) and spontaneous synaptic currents.

	sAPs frequency (Hz) 0 h	sAPs frequency (Hz) 1.5 h	sAPs frequency (Hz) 3 h	sAPs duration (ms) 0 h	sAPs duration (ms) 3 h	sAPs amplitude (mV)	sEPSC frequency (Hz)	sIPSC frequency (Hz)
Control	12.7 ± 2.7			1.3 ± 0.08		61.7 ± 3.2	0.4 ± 0.2	7.7 ± 4.9
TEA	13.6 ± 2.9	8.3 ± 1.9	14.7 ± 4.5	1.8 ± 0.14 ***	1.9 ± 0.18 *	67.2 ± 3.9	0.3 ± 0.1	7.5 ± 3.8
n	16	7	7	9	5	11	8	3

*, $P < 0.05$, *vs* control; ***, $P < 0.0005$, *vs* control.