Activity level-dependent synapse-specific AMPA receptor trafficking regulates transmission kinetics

Running title: Synaptic-specific AMPA-R trafficking

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Fig. S1. Basic membrane properties of GluR-GFP expressing and non-expressing neurons
(A) Resting membrane potential (RMP) (ctrl: -63.3 ± 1.4 mV; exp: -62.9 ± 1.3 mV; n=18, p=0.68), input resistance (ctrl: 55.5±2.6 MΩ; exp: 54.0±3.3 MΩ; n=18, p=0.76) and time constant (ctrl: 21.4±2.9 ms; exp: 21.3±3.7 ms; n=18, p=0.78) of GluR-GFP expressing and non-expressing layer 4 neurons.
(B) Resting membrane potential (RMP) (ctrl: -62.8±2.3 mV; exp: -64.1±1.4 mV; n=10, p=0.88), input resistance (ctrl: 56.8±2.4 MΩ; exp: 55.5±2.5 MΩ; n=10, p=0.39) and time constant (ctrl: 20.7±2.5 ms; exp: 19.9±2.4 mV; n=10, p=0.88) of GluR4ct-RFP and GluR1ct-GFP expressing layer 4 neurons.
(C) Resting membrane potential (RMP) (ctrl: -63.0±2.3 mV; exp: -62.8±2.2 mV; n=8, p=0.67), input resistance (ctrl: 53.9±3.1 MΩ; exp: 54.2±3.3 MΩ; n=8, p=0.89) and time constant (ctrl: 19.4±2.1 ms; exp: 21.1±2.2 mV; n=8, p=0.67) of GluR4ct-RFP and GluR2ct-GFP expressing layer 4 neurons.

Fig. S2. Spontaneous activity in layer 4 cortical neurons in vivo
(A) Morphology of a layer 4 spiny stellate neuron recorded from a rat with all whiskers trimmed. Intracellular recording traces showed numerous spontaneous PSPs in the cell.
(B) Morphology of a layer 4 spiny stellate neuron recorded from a rat 18 hrs after cortical infusion of TTX. Intracellular recording traces showed the absence of spontaneous PSPs in the cell.

Fig. S3. Involvement of GluR1-4 in synaptic transmission of layer 4 neurons
The experiments performed to test the involvement of GluR1-, GluR2L-, GluR4- and GluR2-containing AMPA-Rs in synaptic transmission of layer 4 neurons. Rectified: rectifications of AMPA responses were enhanced in expressing neurons; depressed: AMPA responses were depressed in expressing neurons; n.s.: AMPA responses were not significantly different in expressing neurons compared to non-expressing neurons.