

Supporting Information

Brandalise and Gerber 10.1073/pnas.1317667111

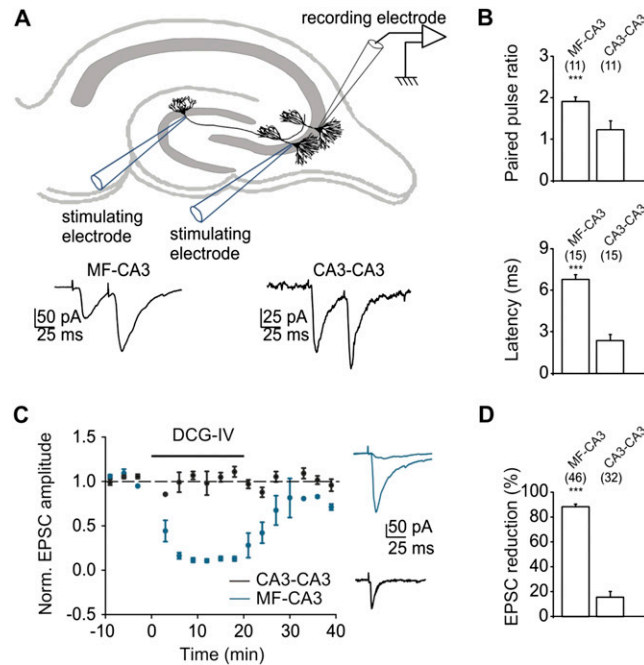


Fig. S1. Criteria for differentiating between synaptic responses evoked by mossy fibers and CA3 recurrent fibers. (A) Schematic of recording configuration. (Insets) Representative current traces evoked by paired-pulse stimulation with a 50-ms interval. (B) Pooled data. Mossy fiber stimulation always resulted in paired-pulse facilitation (1.96 ± 0.3 ; $P < 0.001$), whereas CA3 recurrent fiber stimulation induced either paired-pulse facilitation or depression (1.2 ± 0.2 ; $P = 0.15$) (1). In addition, the latency of evoked responses is longer when stimulating mossy fibers (6.8 ± 0.3 ms; $P < 0.001$) (2) versus CA3 recurrent fibers (2.3 ± 0.4 ms; $P < 0.001$) (3). (C) DCG-IV ($2 \mu\text{M}$), an mGlu2 agonist that blocks glutamate release from mossy fiber but not CA3 pyramidal cell terminals (4), reduced mossy fiber responses by $88.2 \pm 2.1\%$ ($P < 0.001$) and CA3 responses by $14.6 \pm 5\%$ ($P > 0.74$). (D) Pooled data for DCG-IV experiments.

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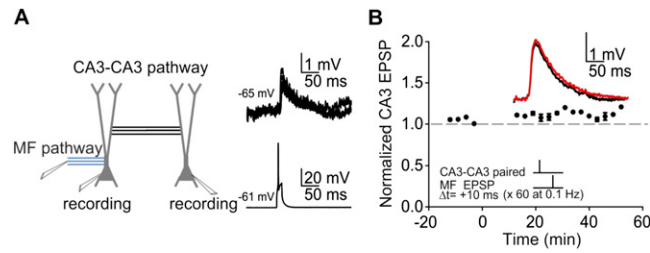


Fig. 56. (A) Activation of a single CA3 recurrent axon by recording from two synaptically connected CA3 pyramidal cells. (B) Repetitive pairing (60 times at 0.1 Hz) of the CA3 recurrent response evoked by stimulating a single axon, followed after 10 ms by a mossy fiber-evoked subthreshold response, did not result in synaptic potentiation ($n = 4$).

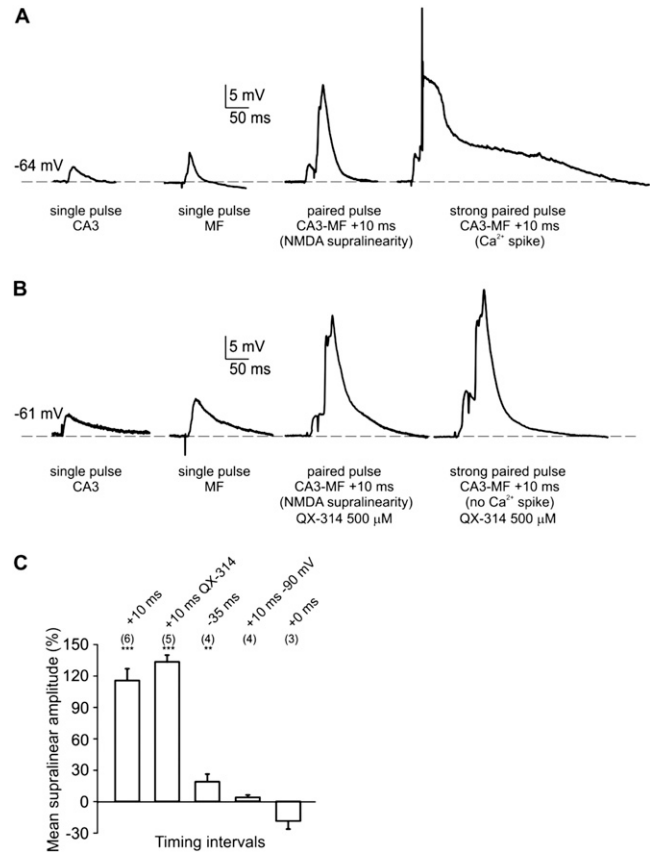


Fig. 57. Characterization of supralinear responses. (A) The supralinear summation of synaptic responses does not require calcium spikes. A dendritic recording from the cell shown in Fig. 3B reveals that a much stronger stimulation than that needed to induce an NMDA spike is required to evoke a calcium plateau response. (B) In the presence of intracellular QX-314 (500 μM), which blocks sodium channels (1) and reduces calcium currents (2), a calcium plateau no longer can be evoked, but the supralinear NMDA response is maintained. (C) Summary data illustrating the mean amplitude of supralinear events recorded in the apical dendrite under various timing and pharmacologic conditions.

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2. Talbot MJ, Sayer RJ (1996) Intracellular QX-314 inhibits calcium currents in hippocampal CA1 pyramidal neurons. *J Neurophysiol* 76(3):2120–2124.

