Supplementary Figure 1
NMDA receptor expression by NG2+ cells in the corpus callosum. (a) Response of an NG2+ cell to laser-induced photolysis of MNI-D-aspartate (500 μM) recorded at a holding potential of 30 mV (upper traces). A small NMDA receptor-mediated current was visible at positive potentials, but not at negative potentials, indicating that these receptors are sensitive to voltage-dependent block by Mg2+. Responses to photolysis of MNI-D-aspartate were blocked by the selective NMDA receptor antagonist D,L-CPP (20 μM) (red trace). In this same cell, photolysis of MNI-L-glutamate (500 μM) elicited an inward current at ~90 mV that was blocked by the AMPA/kainate receptor antagonist NBQX (50 μM). (b) Recording from another DsRed+ cell during photolysis of MNI-D-aspartate. In approximately half of DsRed+ cells in the corpus callosum (16/34 cells), photolysis of MNI-D-aspartate did not elicit a response (upper trace), despite the presence of AMPA receptors (lower trace). (c) Response of a cortical pyramidal neuron to photolysis of MNI-D-aspartate, measured at both 20 mV and −75 mV, which was blocked by DL-CPP (20 μM). NMDA receptor currents in NG2+ cells were very small compared to the currents induced in pyramidal neurons in response to the same stimulus (average amplitude in neurons at 20 mV: 1218 ± 276 pA, n = 3). Responses in (a–c) were recorded from P33 NG2-DsRed BAC mice. (d–e) Plot of the peak amplitude of DsRed+ cell responses to focal application of NMDA (d) or photolysis of MNI-D-aspartate (e). Red boxes indicate cells with no response (18/22 cells for NMDA puff, 16/34 cells for photolysis of MNI-D-aspartate), while green circles indicate the average amplitude of responses from cells in which a D,L-CPP-sensitive current was detected (mean amplitude: NMDA puff, P7−12, 10.1 ± 3.2 pA, n = 8; P20−40, 7.0 ± 2.3 pA, n = 7; MNI-D-aspartate uncaging, P30−33, 6.0 ± 2.2 pA, n = 6). All amplitude measurements were made at a holding potential of 30 mV at ages between P7−12 and P20−40.