Figure S7. Application of Kainate (100 µM) does not translocate CaMKII clones.
Experimental conditions and analysis of data as in Fig. 4; n (left to right)= 7, 4, 8, 4, 7, 4; mean±SEM.

Figure S8. Alternative analysis of CaMKII puncta by use of cell filler mRFP.
CaMKIIα translocation in cells expressing wildtype (wt) and calcium impermeable (R/-) NMDARs, respectively. Neurons were transfected with equal amounts of plasmid DNA of expression constructs for EGFP-tagged CaMKIIα and plain mRFP. Translocation experiments and image acquisition were performed as described in Methods section. Confocal stacks were Z-projected for each channel individually. A dendritic region of approx. 50-300 µm combined dendritic length was selected for correlation diagram analysis (ImageJ plugin ‘colocalization finder’; http://rsb.info.nih.gov/ij/), where pixel were selected via a rectangular thresholding that allowed only for intensity values in the green channel exceeding the intensity values in the red channel by at least 25%. Particles in the obtained binary image that were of reasonable area (0.5-1.5 µm diameter) were counted automatically. n (left to right)=5, 4, 6, 3, 9, 3, 8, 4; mean±SEM; (*) p<0.05, (**) p<0.01, (***) p<0.001.

Figure S9. An estimated sub-membrane Ca^{2+} concentration profile (nano-domain) in the proximity of the open NMDA receptor channel mouth.
Because the NMDA receptor opening kinetics is slow (characteristic time scale 20-30 ms) compared to the nm-scale diffusion equilibration time, the profiles were obtained using solutions for the continuous diffusion source (Crank, 1975), equation see inset, where A is the dimensionality factor, C is concentration, Erfc denotes complementary error function, t is time; $D \approx D_e / 60$ is Ca^{2+} diffusivity in conditions of heavy endogenous buffering inside the spine ($D_e = 0.25 \mu m^2/ms$ is the effective Ca^{2+} intracellular diffusion coefficient) (Sabatini et al., 2001).