State-dependent diffusion of actin-depolymerizing factor/cofilin underlies the enlargement and shrinkage of dendritic spines

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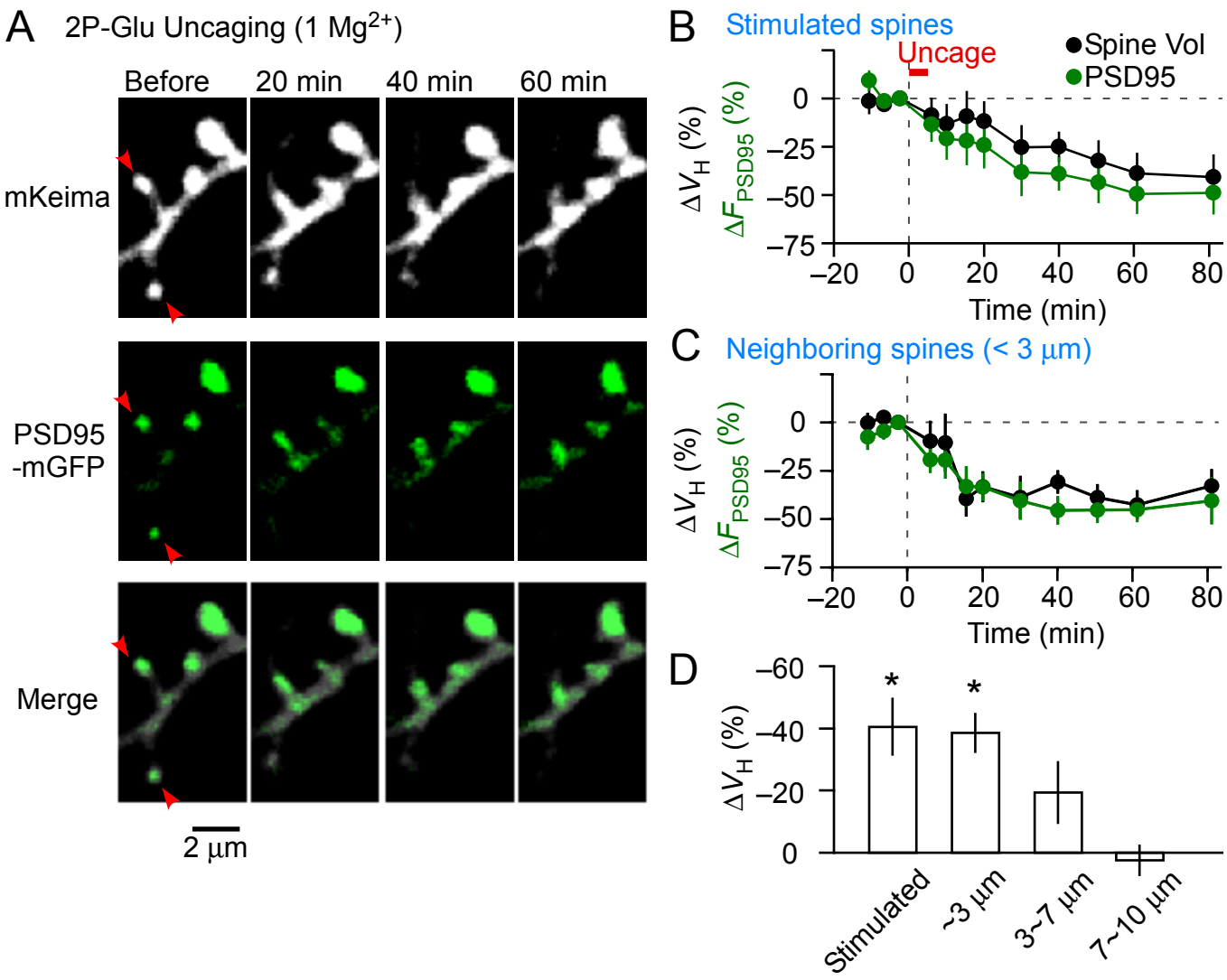

Supplementary Figure S1. Spine shrinkage induced by low-frequency uncaging stimulation (LFS).
Glutamate uncaging was applied at 1 Hz for 5 min in a slice preparation that was transfected with mKeima and PSD95-mGFP. LFS via glutamate uncaging was applied to non-whole-cell clamped neurons, and spine volume changes were measured according to mKeima fluorescence. (**A**) Images of a dendrite where two spines, which are indicated by the red arrows, were subjected to LFS. The upper and lower panels show mKeima and PSD95-mGFP, respectively. (**B, C**) Time course of the change in spine volumes and PSD95-mGFP fluorescence of spines subjected to LFS (red bar, eight spines, five dendrites) (B) or those in the neighboring spines (< 3 μm from the stimulated spine, seven spines) (C). (**D**) The average reduction in spine volumes at each distance from the stimulated spines (stimulated, –41% ± 9.4%, eight spines, five dendrites; < 3 μm, 39% ± 6.4%, seven spines; 3–7 μm, –19% ± 10%, 15 spines; 7–10 μm, 2.5% ± 5.1%, eight spines). The volume reduction was significant according to the Wilcoxon signed-rank test vs. zero for < 3 μm (p = 0.018) but was not significant for 3–7 μm and 7–10 μm at p = 0.088 and 0.58, respectively. Data represent the mean ± SEM, *p < 0.05.