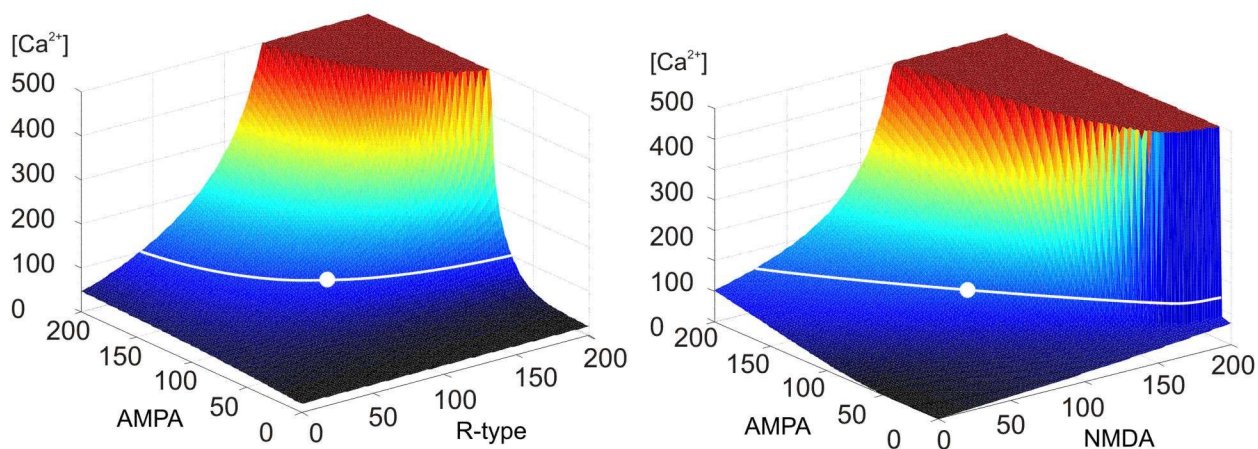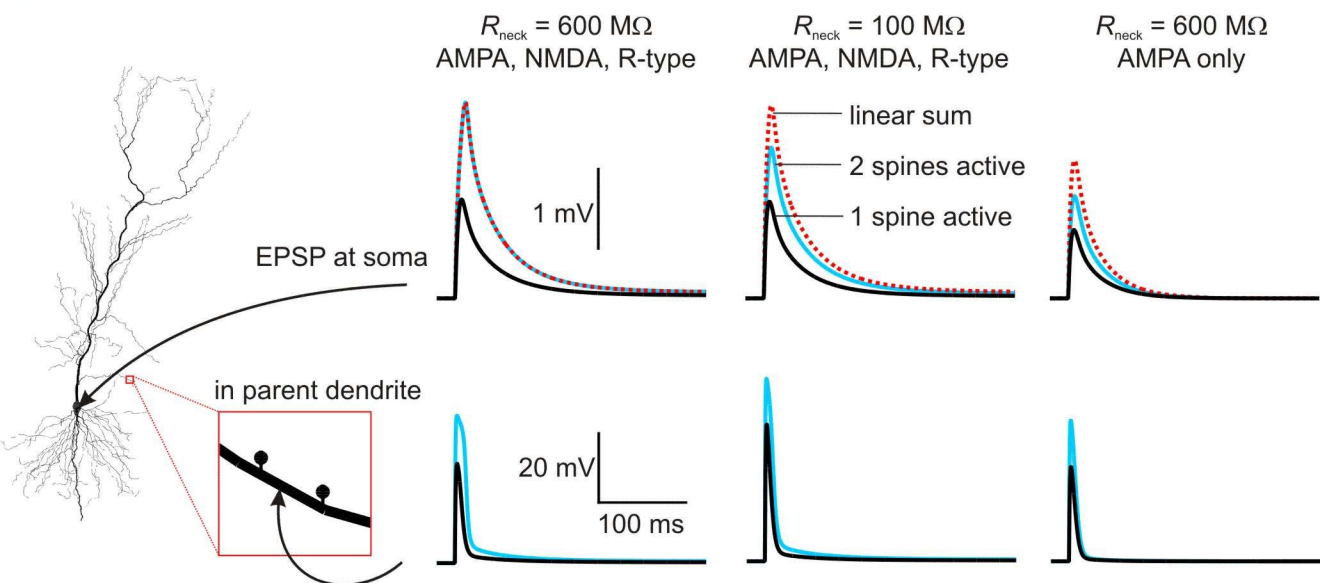**Supplemental Figure 3**. **(A)** Parameter space of NEURON model. The amplitude of simulated spine calcium transients was dependent on AMPA receptor and R-type calcium channel densities (left) and NMDA receptor density (right). White dot indicates channel densities used in (B) and in Fig. 4. White line indicates other channel density combinations consistent with our experimental data. All axes scaled in % of best fit, absolute channel numbers are given in Supplemental Table 1. Black area: Ca^{2+} silent spines. Truncated red area: Spine spike caused by runaway depolarization. **(B)** Electrical amplification leads to linear summation of simultaneously active inputs. Simulated EPSPs are shown at the soma (top row) and in the thin dendrite between the two active spines (bottom row). Black traces: single input; Blue trace: both inputs active; Red dotted trace: linear prediction. If spine neck resistance is low (center column) or the spines lack voltage-activated conductances (right column), summation becomes sublinear due to the reduction in driving force.