Supplementary data 3.

AP failures and recovery time course of latencies during PTH.

(a) Whole-cell current clamp recording from a calyx after a 3s tetanus (100 Hz) followed by single stimuli delivered at 2 Hz. Two failures of single APs occurred during the initial PTH period. The intensity of stimulation was 1.8 V for the tetanus and single stimuli. The symbol X indicates stimulation that failed to elicit APs. No failures occurred during the tetanus. (b) The latency of superimposed single APs in the post-tetanus period of A is shown. Latency increased and gradually recovered to that recorded before the tetanus. In the same calyx an increase of the stimulus intensity from 1.8 V to 2.7 V avoided AP failure during PTH (red trace). The latency was measured from the peak of stimulus artifact to the peak of AP since AP rising times did not change. The trace marked 1 is obtained at pre-tetanic periods and 2-4 are from post-tetanic periods. (c) Presynaptic spikes (PS) recorded in the cell-attached mode before membrane rupture for the whole-cell mode. A 100 Hz tetanus of 3 s was followed by 2 Hz stimulation. Two failures of PS occurred at 1' and PS reappeared at 2'. (d) Summary of the changes in AP latency (filled circle, n = 7) and PS latency (open triangle, n = 5), and membrane potential Vm (open circle, n = 5) after the tetanus. Note how the latency shift is correlated to the recovery time course of Vm. (e) Presynaptic APs were generated by current injection (200 pA). A short 5 ms pulse generates a single AP but a 500 ms injection generated a train of APs at 160-200 Hz. A PTH is present at the end of the 500 ms pulse and it produces AP failures (black). In the presence of TTX (1 µM, red) there are no AP spikes or PTH.