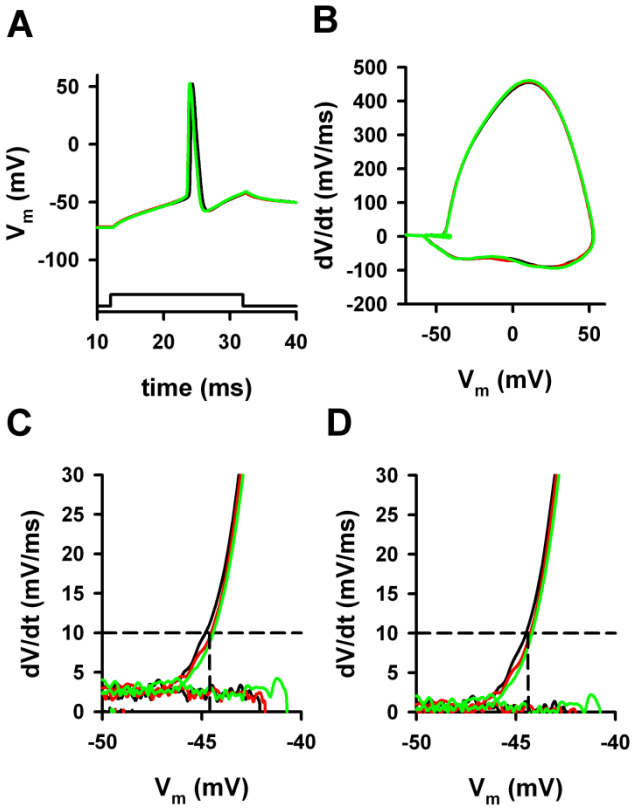
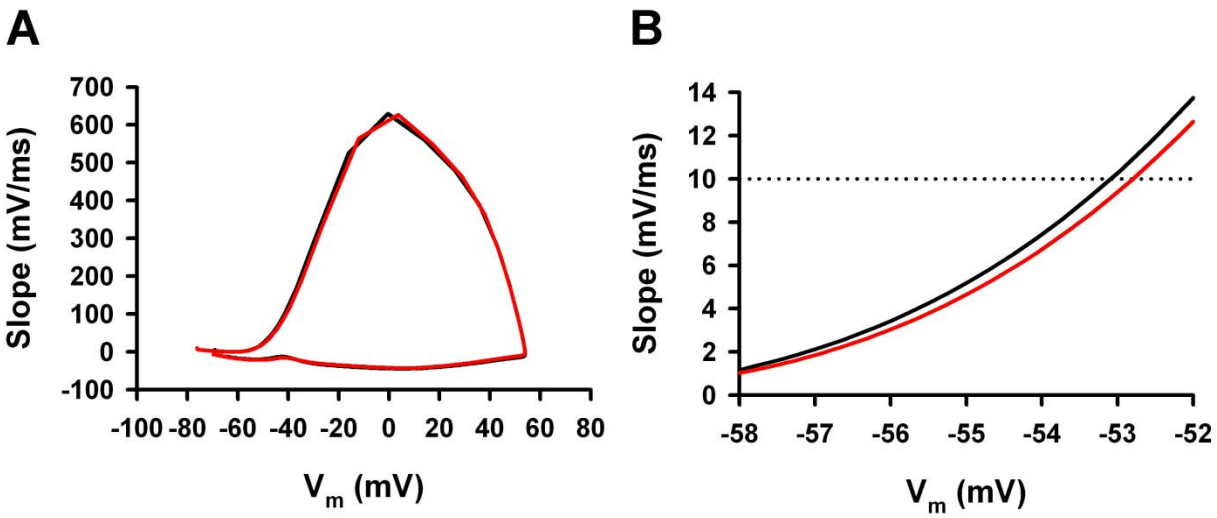
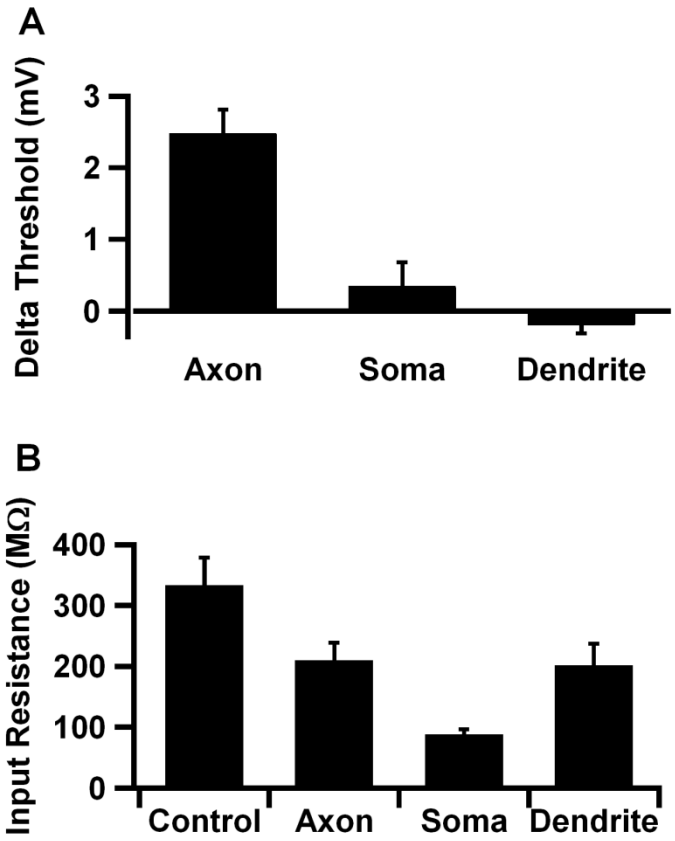


Supplemental Figure 1. Stability of responses and transformation of phase plots. **A.** Three successive, superimposed responses (black, red, green) of a granule neuron to fixed-amplitude depolarizing current injection are shown. The current injection is represented by the rectangular waveform below the action potential. **B.** The transformation of the raw waveform into a phase plot. **C.** The portion of the phase plots near action potential threshold. The dashed horizontal line represents the threshold used of 10 mV/ms. The vertical dashed line indicates voltage threshold on the x-axis. Note the small non-zero slope representing the passive depolarization during current injection. **D.** This passive dV/dt was subtracted from all phase plots in the paper before final calculation of voltage threshold.



Supplemental Figure 2. Simulations with 10-fold higher sodium conductance in the AIS than in the standard simulations (50-fold higher conductance than in the rest of the axon). Black trace indicates baseline. The red trace indicates AIS GABA conductance present (E_{Cl} = -80 mV). **A.** Full phase plot. Note that the phase plot peak exceeded 600 mV/ms, a higher value than ever seen experimentally, suggesting that the simulation employed a supraphysiologically high sodium conductance. **B.** Subtracted phase plots near threshold, showing that introduction of the GABA conductance still depolarized threshold measured in the soma.



Supplemental Figure 3. Muscimol application to dendrites does not alter voltage threshold. Muscimol was applied to the AIS, to the soma, and to a dendrite of cells (N = 4). **A.** Dendrite application failed to alter threshold significantly although the change in input resistance was similar to that of AIS application (**B**).