

Network Model of Nociceptive Processing in the Superficial Spinal Dorsal Horn Reveals Mechanisms of Hyperalgesia, Allodynia, and Spinal Cord Stimulation

Abbreviated Title: Network model of the superficial dorsal horn

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Supplemental Figs. S1–S3

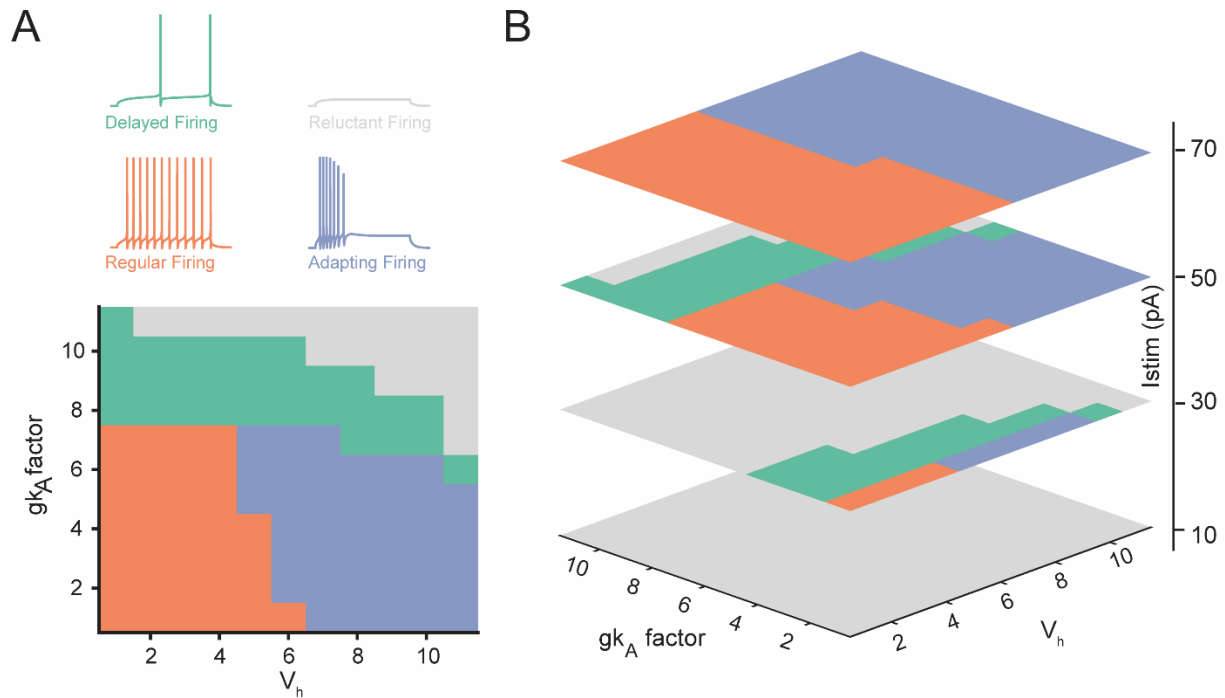


Figure S1. Changes in PKC γ neuron firing behavior with different biophysical properties. **A**, Example PKC γ neuron firing behaviors as the value of V_h (shift in the Boltzmann equations for the slow inactivation gate, Equations 4-5, (Aguiar et al., 2010)) and gK_A (the conductance of the A-Type potassium current) are varied in the model. **B**, Changes in the neuron responses with increasing current inputs.

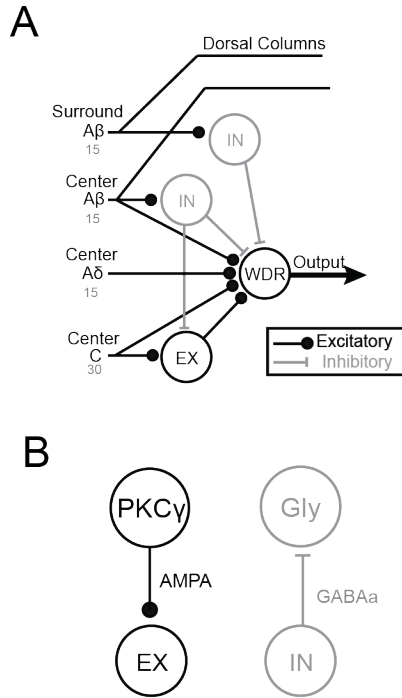


Figure S2. Combined model responses were generated by adding existing deep dorsal horn model to the superficial dorsal horn model. **A**, Network architecture of existing deep dorsal horn model (Zhang et al., 2014). **B**, Additional network connections added to connect the superficial dorsal horn model (See Figure 1A) and the deep dorsal horn model.

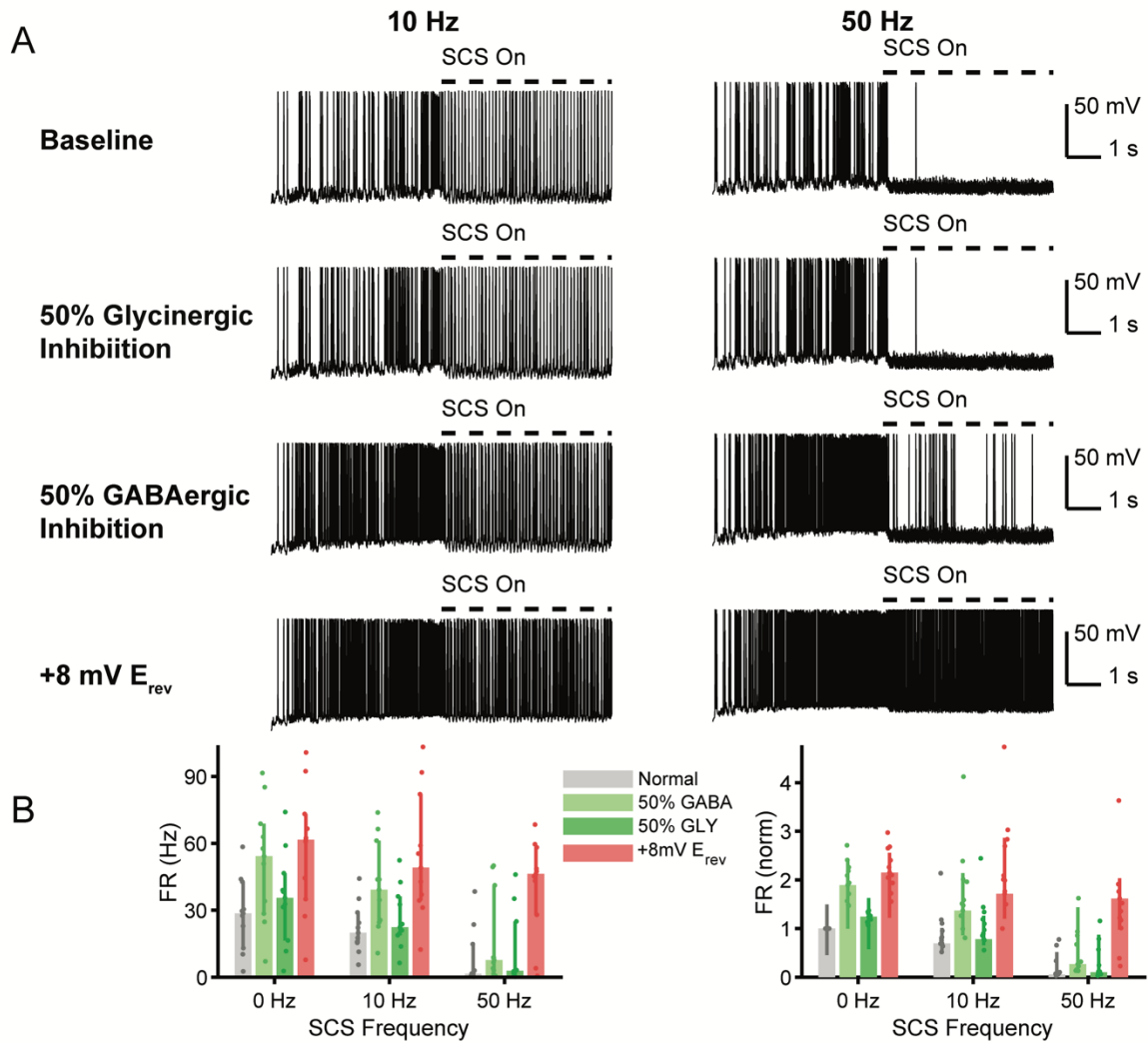


Figure S3. Example model WDR neuron responses to 5 seconds of SCS at 10 Hz and 50 Hz. **A**, WDR neuron activity without any changes to the model architecture, and with a 50% reduction in the strength of glycinergic synapses, a 50% reduction in the strength of GABAergic synapses or a +8mV shift in reversal potential of both GABAergic and glycinergic synapses. **B**, Absolute and normalized in median model WDR neuron median firing rates with different pain models. The right plot firing rates are normalized to the baseline firing rate without SCS ($FR(\text{norm}) = 1$). Bars show the median and error bars show 25th and 75th percentile. Dots show individual responses across simulations.