

Name	Description	Value	Source
From literature			[2, 4]
\max_P	maximum firing rate of neuronal population P	50 Hz	
\max_E	maximum firing rate of neuronal population E	50 Hz	
\max_I	maximum firing rate of neuronal population I	80 Hz	
Fitted to experimental data, see Figure 2			[4]
α_E	sensitivity of the response in the E population	5.2	
α_I	sensitivity of the response in the I population	9.5	
α_{NMDA}	sensitivity of the response in the NMDA receptors	10.0	
α_P	sensitivity of the response in the P population	11.5	
β_E	half-activation threshold of the E population	29.2	
β_I	half-activation threshold of the I population	28.0	
β_{NMDA}	half-activation threshold of the NMDA receptors	38.0	
β_P	half-activation threshold of the P population	28.2	
From literature			[1,4]
τ_E	intrinsic time scale of neuronal population E	10 ms	
τ_I	intrinsic time scale of neuronal population I	20 ms	
τ_{NMDA}	intrinsic time scale of the NMDA receptors	1 s	
τ_P	intrinsic time scale of neuronal population P	1 ms	[3]
Chosen to replicate experimental responses to nociceptive stimuli			
$g_{A\beta C}$	weight of the presynaptic inhibition from A β -fibers to C-fibers	0.05	
$g_{A\beta C}^{\text{neuro}}$	neuropathic weight from A β -fibers to C-fibers	0.25	
$g_{A\beta I}$	synaptic weight from A β -fibers to neuronal population I	0.8	
$g_{A\beta P}$	synaptic weight from A β -fibers to neuronal population P	0.8	
g_{CE}	synaptic weight from C-fibers to neuronal population E	1.6	
g_{CP}	synaptic weight from C-fibers to neuronal population P	0.8	
$g_{A\delta P}$	synaptic weight from A δ -fibers to neuronal population P	1.9	
g_{EP}	synaptic weight from E to P neuronal populations	0.35	
g_{IE}	synaptic weight from I to E neuronal populations	0.6	
g_{IP}	synaptic weight connection from I to P neuronal populations	1.8	
\max_{NMDA}	maximum synaptic strength of the NMDA pathway	2.0	

Table 1: Summary of model parameters and their default values. The parameter values are either chosen from an experimentally determined range in the literature or they are chosen to replicate several experimental responses to nociceptive stimuli (i.e., pain inhibition, wind-up, etc.) discussed in this work.