

Supporting Information

S1 Model Parameter Values

Parameter	Value	Parameter	Value	Parameter	Value
V_{GLUT}	0.01 M/s	V_{GK}	0.01 M/s	V_{PFK}	0.01 M/s
k_{PDH}	0.001 M/s	$k_{\text{GLC}}^{\text{GLUT}}$	13 mM	k_{GK}	13 mM
$h_{\text{GK}}^{\text{GLC}}$	4	k_{GPI}	3.3	k_{PFK}	0.06
$K_{\text{PFK}}^{\text{AMP}}$	30 μM	$K_{\text{PFK}}^{\text{FBP}}$	1 μM	$K_{\text{PFK}}^{\text{F6P}}$	50 μM
$K_{\text{PFK}}^{\text{ATP}}$	0.1 μM	f_{AMP}	0.02	f_{FBP}	0.2
f_{MT}	20	f_{BT}	20	f_{ATP}	20
k_{LG}	0.3	V_{ANT}	1 s^{-1}	$k_{\text{hyd},\text{bas}}$	$3.3 \times 10^{-3} \text{ s}^{-1}$
$k_{\text{hyd}}^{\text{Ca}}$	0	k_{ANT}	1	$k_{\text{ANT}}^{\text{PDH}}$	2.2
$V_{\text{ANT}}^{\text{PDH}}$	0.05 M/s	$k_{\text{ANT}}^{\text{Ca}}$	$3.5 \times 10^{-4} \mu\text{M}$	A_{tot}	3 mM
V_{Ca}	25 mV	V_{K}	-75 mV	$g_{\text{Ca}}(V)$	1 nS
$g_{\text{K}}(V)$	2.7 nS	$g_{\text{K}}(\text{Ca})$	50 pS	$g_{\text{K}}(\text{ATP})$	25.5 nS
$v_{\text{Ca}}(V)$	-20 mV	$v_{\text{K}}(V)$	-16 mV	$k_{\text{K}}(\text{Ca})$	0.5 μM
$h_{\text{Ca}}(V)$	0.08	$h_{\text{K}}(V)$	0.2	$h_{\text{K}}(\text{Ca})$	2
$\tau_{\text{K}}(V)$	20 ms	C_{m}	5.3 pF	k_{dd}	17 μM
k_{td}	26 μM	k_{tt}	1 μM	$k_{\text{cyt}}^{\text{Ca}}$	0.01
$k_{\text{ER}}^{\text{Ca}}$	0.01	$k_{\text{ER},\text{in}}$	0.46 s^{-1}	$k_{\text{ER},\text{out}}$	0.02 s^{-1}
k_{PM}	0.23 s^{-1}	I_{slope}	1 A.U./nM	C_{thr}	0.22 μM
τ_{G}	50 s	G_{min}	8 mM	G_{max}	14 mM
$I_{1/2}$	30 A.U.	S_{G}	50 A.U.		

S1 Table. Model parameter values.

Parameter values of the Dual Oscillator Model used for all simulations and parameter values for the closed loop system used in Fig. 12.