S1 TABLE. MODEL PARAMETERS

Voltage-gated K^+ currents			
SHL1			
Parameter		**Value**	**Unit**
m_∞	$V_{0.5}$	11.2 (-6.8)	mV
	k_a	14.1	mV
h_∞	$V_{0.5}$	-33.1	mV
	k_i	8.3	mV
τ_m	a	13.8 (1.4)	ms
	b	-17.5	mV
	c	12.9	mV
	d	-3.7	mV
	e	6.5	mV
	f	1.9 (0.2)	ms
τ_h^{f}	a	539.2 (53.9)	ms
	b	-28.2	mV
	c	4.9	mV
	d	27.3 (2.7)	ms
τ_h^{s}	a	8422.0 (842.2)	ms
	b	-37.7	mV
	c	6.4	mV
	d	118.9 (11.9)	ms
SHK1			
m_∞	$V_{0.5}$	20.4	mV
	k_a	7.7	mV
h_∞	$V_{0.5}$	-7.0	mV
	k_i	5.8	mV
τ_m	a	26.6	ms
	b	-33.7	mV
	c	15.8	mV
	d	-33.7	mV
	e	11.2	mV
	f	3.8	ms
τ_h	a	1400	ms
KVS1			
m_∞	$V_{0.5}$	57.1 (27.1)	mV
	k_a	25.0	mV
h_∞	$V_{0.5}$	47.3 (17.3)	mV
	k_i	11.1	mV
τ_m	a	30.0 (3.0)	ms
	b	18.1	mV
	c	-20	mV
	d	1.0 (0.1)	ms

τ_h^{f}	a	88.5 (8.9)	ms
	b	50.0	mV
	c	-15.0	mV
	d	53.4 (5.3)	ms
KQT3			
m_∞	$V_{0.5}$	-12.8 (7.7)	mV
	k_a	15.8	mV
w_∞	$V_{0.5}$	-1.1	mV
	k_i	28.8	mV
	a	0.5	
	b	0.5	
s_∞	$V_{0.5}$	-45.3	mV
	k_i	12.3	mV
	a	0.3	
	b	0.7	
τ_m^{f}	a	395.3 (39.5)	ms
	b	-38.1	mV
	c	33.6	mV
τ_m^{s}	a	5503.0 (550.3)	ms
	b	5345.4 (534.5)	ms
	c	-0.0283	mV^{-1}
	d	-23.9	mV
	e	4590 (459.1)	ms
	f	-0.0357	mV^{-1}
	g	14.2	mV
τ_w	a	0.5	ms
	b	2.9	ms
	c	-48.1	mV
	d	48.8	mV
τ_s	a	500	ms
EGL2			
m_∞	$V_{0.5}$	6.9	mV
	k_a	14.9	mV
τ_m	a	16.8 (8.4)	ms
	b	-122.6	mV
	c	-13.8	mV
	d	8.1 (4.1)	ms
EGL36			
m_∞	$V_{0.5}$	63.0	mV
	k_a	28.5	mV
τ_m^{s}	a	355.0	ms
τ_m^{m}	a	63.0	ms
τ_m^{f}	a	13.0	ms
IRK			
m_∞	$V_{0.5}$	-86.5	mV
	k_a	-28.0	mV
τ_m	a	17.1	ms

	b	-17.8	mV
	c	20.3	mV
	d	-43.4	mV
	e	11.2	mV
	f	3.8	ms
Voltage-gated Ca^{2+} currents			
EGL19			
m_∞	$V_{0.5}$	5.6 (-4.4)	mV
	k_a	7.5	mV
h_∞	$V_{0.5}$	24.9 (14.9)	mV
	k_i	12.0	mV
	k_i^b	-10.5 (-20.5)	mV
	$V_{0.5}^b$	8.1	mV
	a	1.4	
	b	0.1	
	c	6.0	
	d	0.6	
τ_m	a	2.9	ms
	b	5.2 (-4.8)	mV
	c	6.0	mV
	d	1.9	ms
	e	1.4 (-8.6)	mV
	f	30.0	mV
	g	2.3	ms
τ_h	a	0.4	
	b	44.6	ms
	c	-23.0 (-33.0)	mV
	d	5.0	mV
	e	36.4	ms
	f	28.7(18.7)	mV
	g	3.7	mV
	h	43.1	ms
UNC2			
m_∞	$V_{0.5}$	-12.2 (-37.2)	mV
	k_a	4.0	mV
h_∞	$V_{0.5}$	-52.5 (-77.5)	mV
	k_i	5.6	mV
τ_m	a	4.5	ms
	b	-8.2 (-38.2)	mV
	c	9.1	mV
	d	15.4	mV
	e	0.3	ms
τ_h	a	83.8 (142.5)	ms
	b	52.9 (22.9)	mV
	c	3.5	mV
	d	72.1 (122.6)	ms
	e	23.9 (-6.1)	mV
	f	3.6	mV

CCA1			
m_∞	$V_{0.5}$	-43.32(-57.7)	mV
	k_a	7.6 (2.4)	mV
h_∞	$V_{0.5}$	-58.0 (-73.0)	mV
	k_i	7.0 (8.1)	mV
τ_m	a	40.0 (20)	ms
	b	-62.5 (-92.5)	mV
	c	-12.6 (21.1)	mV
	d	0.7 (0.4)	ms
τ_h	a	280 (22.4)	ms
	b	-60.7 (-75.7)	mV
	c	8.5 (9.4)	mV
	d	19.8 (1.6)	ms
Ca^{2+}-regulated K^+ currents			
SLO1			
w_{yx}		0.013	mV^{-1}
w_{xy}		-0.028	mV^{-1}
w_0^-		3.15	ms^{-1}
w_0^+		0.16	ms^{-1}
K_{xy}		55.73	μM
n_{xy}		1.30	
K_{yx}		0.034	μM
n_{yx}		10^{-4}	
SLO2			
w_{yx}		0.019	mV^{-1}
w_{xy}		-0.024	mV^{-1}
w_0^-		0.87	ms^{-1}
w_0^+		0.028	ms^{-1}
K_{xy}		93.45	μM
n_{xy}		1.84	
K_{yx}		3294.55	μM
n_{yx}		10^{-5}	
KCNL			
K_{Ca}		0.33	μM
τ_m	a	6.3	ms
Intracellular calcium calculation			
g_{sc}		40	pS
V_{Ca}		60	mV
r		13	nm
F		96485	$C\,mol^{-1}$
D_{Ca}		250	$\mu^2 m\,s^{-1}$
k_B^+		500	$\mu M^{-1}\,s^{-1}$
$[B]_{\text{tot}}$		30	μM
$[Ca^{2+}]_{c,i}^n$		0.05	μM
V_{cell}		31.16 (AWC), 5.65 (RMD)	μm^3
f		0.001	
τ_{Ca}		50	ms

$[Ca^{2+}]^m_{eq}$	0.05	μM