Aguiar model

In FIGURES 1 and 2 the results of the Aguiar's model are shown. These figures aims to determine the timescales of each current activation/inactivation and to determine the nature of the feedback involved. TABLE 1 summarizes these properties for each ion current of this model. A positive feedback is called regenerative while a negative one is called restorative.

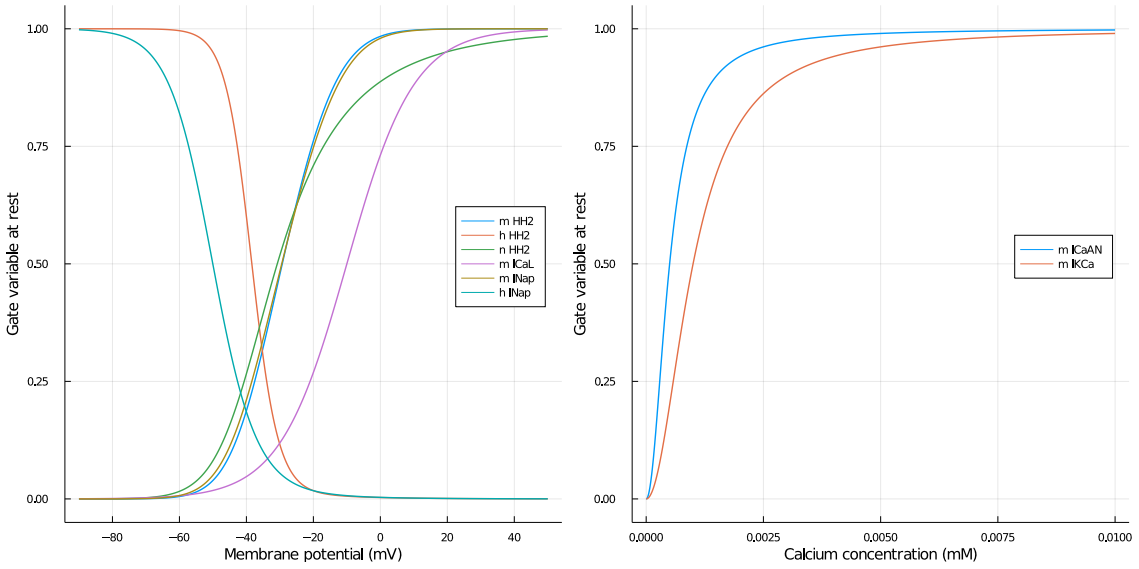

FIGURE 1 – Evolution of the Aguiar's model ion currents activation/ inactivation variables at rest according to membrane potential (left) or intracellular calcium concentration (right).

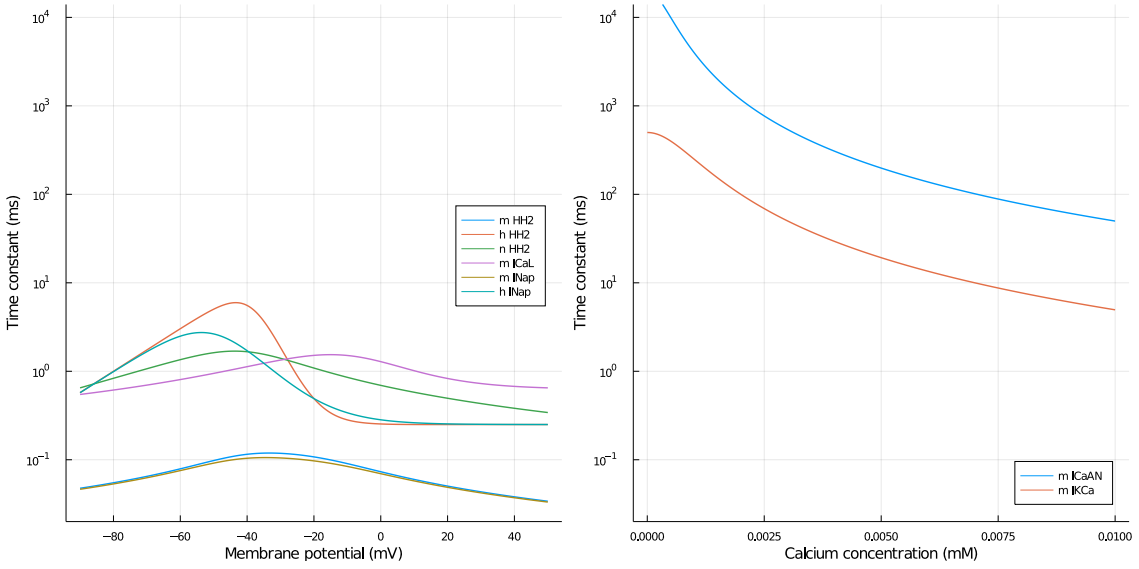

FIGURE 2 – Evolution of time constants of the Aguiar's model ion currents activation/ inactivation variables according to membrane potential (left) or intracellular calcium concentration (right).

Current	Gate	Time constant order	ΔI	Δg	R	Feedback
I_{Na}	activation	10^{-1}ms	inward	+	-	Fast regenerative
	inactivation	10^{0}ms		-	+	Slow restorative
I_{KDR}	activation	10^{0}ms	outward	+	+	Slow restorative
I_{CaL}	activation	10^{0}ms	inward	+	-	Slow regenerative
I_{Na_p}	activation	10^{-1}ms	inward	+	-	Fast regenerative
	inactivation	10^{0}ms		-	+	Slow restorative
I_{CAN}	activation	10^{2}ms	inward	+	-	Ultra-slow regenerative
$I_{K,Ca}$	activation	10^{1}ms	outward	+	+	Slow restorative

TABLE 1 – Summary of the timescales and the feedback type for each activation/inactivation variable of each of the Aguiar's model ion currents. Columns ΔI, Δg and R aims respectively to determine the sign of the ion current, the sign of channels conductance variation for a positive variation of the membrane potential and the sign of the resistance associated to the considered current and membrane potential variation, allowing to determine the feedback type.

LeFranc

In FIGURES 3 and 4 the results of the LeFranc's model are shown. These figures aims to determine the timescales of each current activation/inactivation and to determine the nature of the feedback involved. TABLE 2 summarizes these properties for each ion current of this model. A positive feedback is called regenerative while a negative one is called restorative.

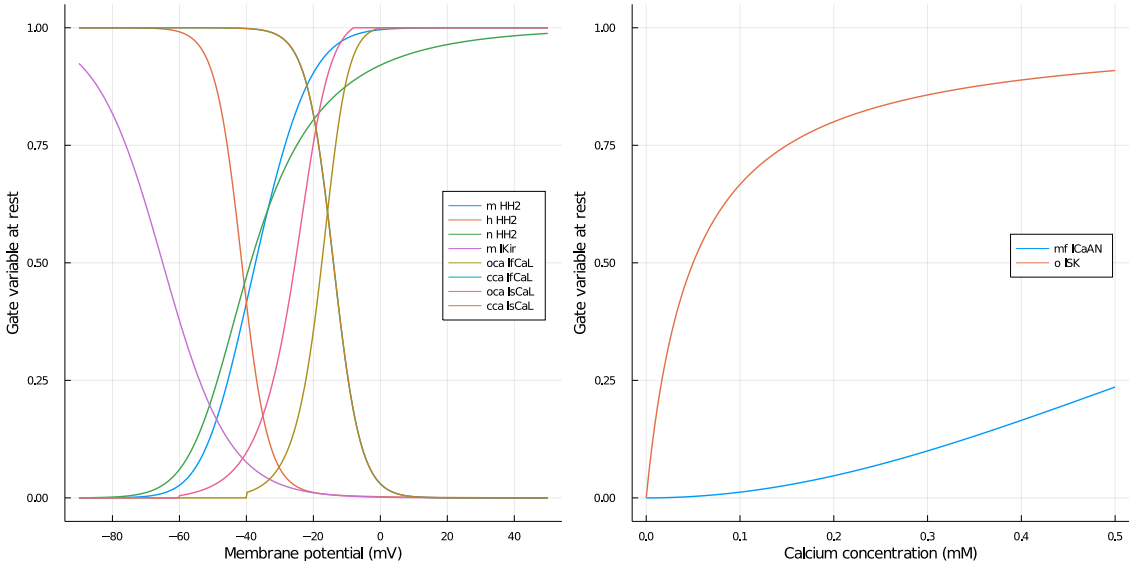

FIGURE 3 – Evolution of the LeFranc's model ion currents activation/ inactivation variables at rest according to membrane potential (left) or intracellular calcium concentration (right).

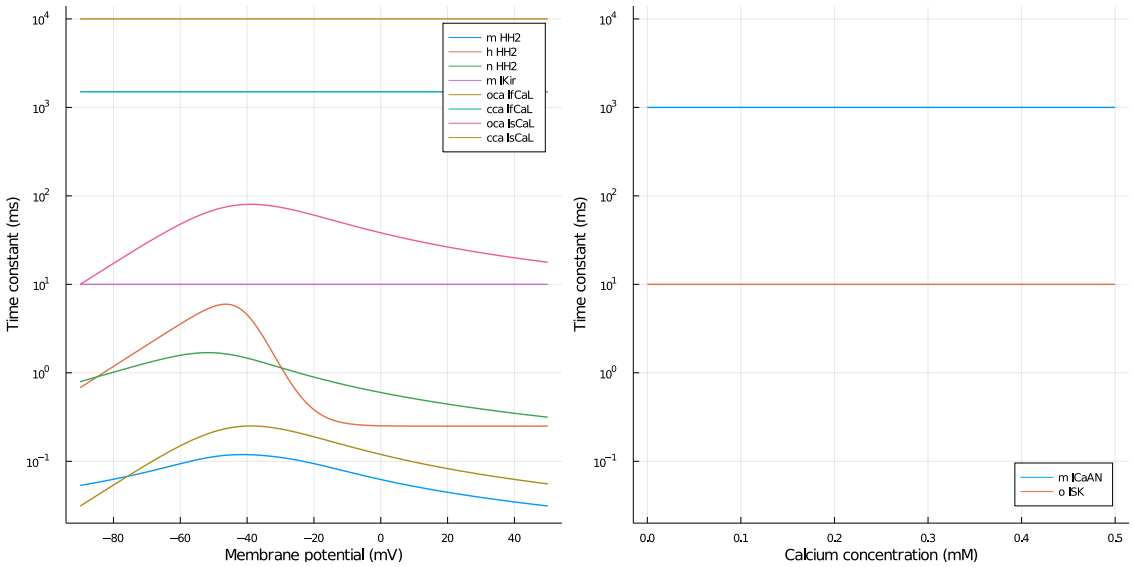

FIGURE 4 – Evolution of time constants of the LeFranc's model ion currents activation/ inactivation variables according to membrane potential (left) or intracellular calcium concentration (right).

Current	Gate	Time constant order	ΔI	Δg	R	Feedback
I_{Na}	activation	10^{-1}ms	inward	+	-	Fast regenerative
	inactivation	10^{0}ms		-	+	Slow restorative
I_{KDR}	activation	10^{0}ms	outward	+	+	Slow restorative
I_{Kir}	activation	10^{1}ms	inward	-	+	Slow restorative
I_{SK}	activation	10^{1}ms	outward	+	+	Slow restorative
I_{fCaL}	activation	10^{-1}ms	inward	+	-	Fast regenerative
	inactivation	10^{3}ms		-	+	Ultra-slow restorative
I_{CAN}	activation	10^{3}ms	inward	+	-	Ultra-slow regenerative
I_{sCaL}	activation	10^{1}ms	inward	+	-	Slow regenerative
	inactivation	10^{4}ms		-	+	Ultra-ultra-slow restorative

TABLE 2 – Summary of the timescales and the feedback type for each activation/inactivation variable of each of the Aguiar's model ion currents. Columns ΔI, Δg and R aims respectively to determine the sign of the ion current, the sign of channels conductance variation for a positive variation of the membrane potential and the sign of the resistance associated to the considered current and membrane potential variation, allowing to determine the feedback type.