Supplement materials

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Pyramidal neurons

Уравнение для сомы, радиатума и ориенса

$$C\frac{dV_s}{dt} = -I_l - I_{Kdr} - I_{Na} - I_A - I_M - I_H - I_{CaL} - I_{sAHP} - I_{mAHP} - I_{CaR} - I_{buff} - \\ -I_{syn} + I_{ext} \quad (1)$$

Уравнение для аксона

$$C\frac{dV_a}{dt} = -I_l - I_{Kdr} - I_{Na} - I_M - I_{syn} \quad (2)$$

Уравнение для LM

$$C\frac{dV_L M}{dt} = -I_l - I_{Kdr} - I_{Na} - I_A - I_{syn} + I_{ext} \quad (3)$$

Натриевый каналы

$$I_{Na} = g_{max,Na} \cdot m^2 \cdot h \cdot s \cdot (V - E_{Na}) \quad (4)$$

For dendiritic compartments

$$m_\infty = \frac{1}{1 + exp(-\frac{V+40}{3})} \quad (5)$$

$$h_\infty = \frac{1}{1 + exp(-\frac{V+45}{3})} \tag{6}$$

For soma/axon compartments

$$m_\infty = \frac{1}{1 + exp(-\frac{V+44}{3})} \tag{7}$$

$$h_\infty = \frac{1}{1 + exp(-\frac{V+49}{3.5})} \tag{8}$$

For all compartments

$$s_\infty = \frac{1 + Na_{att} exp(0.5(V + 60))}{1 + exp(0.5(V + 60))} \tag{9}$$

$$\tau_s = \frac{0.00333 exp(0.0024(V + 60)Q)}{1 + exp(0.0012(V + 60)Q)} \tag{10}$$

$$Q = \frac{F}{RT} \tag{11}$$

The delayed rectifier current is given by:

$$I_{Kdr} = g_{max,Kdr} \cdot n^2 \cdot (V - E_K) \tag{12}$$

For dendiritic compartments

$$n_\infty = \frac{1}{1 + exp(-0.5(V + 42))} \tag{13}$$

For soma/axon compartments

$$n_\infty = \frac{1}{1 + exp(-0.3333(V + 46.3))} \tag{14}$$