

## CORRECTION

Correction: Biophysical modeling of *C. elegans* neurons: Single ion currents and whole-cell dynamics of AWC<sup>on</sup> and RMD

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In the Channel modeling subsection of the Methods, there is an error in the fourth equation. There should be a plus (+) sign between the 1 and the exponential. The correct equation is:

$$m_{x,\infty}(V) = \frac{1}{1 + e^{-\frac{-(V-V_{0.5})}{k_a}}}$$

There are multiple errors in [S1 File](#). There are errors in equations A1, A6, A10, A15, A22, A25, A28, B1, B3, B6, B11, and B13. Please view the correct [S1 File](#) below.

There are multiple errors in [S1 Table](#). Please view the correct [S1 Table](#) below.

There are multiple errors in [S1 Fig](#). The left panel of row A, the right panel of row B, and several panels of row C are incorrect. Please view the correct [S1 Fig](#) below.

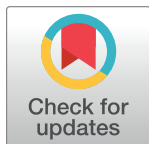
There is an error in [S2 Fig](#). The right panel of row B is incorrect. Please view the correct [S2 Fig](#) below.

## Supporting information

**S1 File. Model equations.** List of equations used to model the channel currents. (PDF)

**S1 Table. Model parameters.** Fitted parameters, as identified by least-squares nonlinear fitting (or by genetic algorithm in the case of SLO channels, see Methods) are reported. Corresponding steady-state activation/inactivation and time constant functions, computed with the fitted parameters, are shown in [S1–S5 Figs](#). We refer the reader to the modeled equations (Eqs 12–19, 26–29, and A–C in [S1 File](#)) explicitly including the fitted parameters. Some channel contributions (SHL1, KVS1, KQT3, EGL2, EGL19, UNC2, CCA1) were modeled based on homologous channels in species different from *C. elegans* or on muscle cells. To include these contributions in the entire neuron model, we *a posteriori* calibrated some of the fitted parameters to match voltage clamp and current clamp data [13, 59]. We shifted half-activation and inactivation potentials and time constants. Such calibrated parameters are reported in parentheses. (PDF)

**S1 Fig. SHL1, KVS1, and KQT3 currents steady-state activation/inactivation variables and time constants.** In panels A–C we report the steady-state activation and inactivation curves (left), the activation time constant function (center), and the inactivation time constant function (right). **A) SHL1 currents.** On the left we report steady-state activation (red) and inactivation (blue) functions (Eqs A1 and A3 in [S1 File](#)). In the middle the activation time constant function ( $\tau_{m_{SHL1}}^S$ , Eq A2 in [S1 File](#)) is represented together with the fitted experimental values



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(black dots, from [25]). In the right panel the solid lines represent the slow inactivation time constant ( $\tau_{\text{SHL1}}^s$ , Eq A4 in [S1 File](#)), while the dashed line describes the fast one ( $\tau_{\text{SHL1}}^f$ , Eq A4 in [S1 File](#)). In this case, black dots are the experimental points extracted from [25]. **B) KVS1 currents.** Steady-state activation (red) and inactivation (blue), with experimental points (blue and red dots, from [31]), are represented on the left (Eqs A6 and A7 in [S1 File](#)). Middle and right panels show respectively activation and inactivation time constants as function of voltage (Eq A8 in [S1 File](#), [31]). **C) KQT3 currents.** Steady-state activation (red, Eq A15 in [S1 File](#), from [26]) and inactivation (blue and green, Eq A18 in [S1 File](#), from [73]) variables are shown on the left. The red dots are experimental points from [26]. Middle panel shows fast (dashed) and slow (solid) activation time constants (Eqs A16 and A17 in [S1 File](#), from [73]). On the left the inactivation time constant ( $\tau_{\text{wKQT3}}$ , Eq A19 in [S1 File](#)) is represented.

(PDF)

**S2 Fig. SHK1, EGL2, EGL36, and IRK currents steady-state activation/inactivation variables and time constants.** In panels A-D we report the steady-state activation and inactivation curves (left), and the activation time constant function (right). **A) SHK1 currents.** Steady-state activation (red, Eq A10 in [S1 File](#)) and inactivation (blue, Eq A12 in [S1 File](#)) functions are represented on the left. Blue and red dots are the experimental points from [25]. On the right the activation time constant function is shown (Eq A11 in [S1 File](#)) with fitted experimental points (black dots) from [29]. **B) EGL2 currents.** On the left is represented the steady-state activation variable (Eq A22 in [S1 File](#)) with experimental data (red dots) from [28]. On the left the activation time constant function (Eq A23 in [S1 File](#)) is shown. **C) EGL36 currents.** Steady-state activation variable (Eq A25 in [S1 File](#)) is shown on the left, with experimental data from [30] (red dots). Fast (red), medium (green) and slow (blue) activation time constants (Eq A26 in [S1 File](#)) are shown on the right. Red, green and blue dots represent experimental measurements as reported in [30]. **D) IRK currents.** Steady-state activation variable is represented on the right (Eq A28 in [S1 File](#)). On the left the activation time constant (Eq A29 in [S1 File](#)) is represented, with experimental data (black dots) from [35].

(PDF)

## Reference

1. Nicoletti M, Loppini A, Chiodo L, Folli V, Ruocco G, Filippi S (2019) Biophysical modeling of *C. elegans* neurons: Single ion currents and whole-cell dynamics of AWC<sup>on</sup> and RMD. PLoS ONE 14(7): e0218738. <https://doi.org/10.1371/journal.pone.0218738> PMID: 31260485