***eLife’s* transparent reporting form**

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* You should state whether an appropriate sample size was computed when the study was being designed
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Not applicable. All data except those in Fig 2 are based on simulations. Experimental data in Fig 2 are from a single neuron, as appropriate to illustrate the differential effects of manipulating two different conductances.

**Replicates**

* You should report how often each experiment was performed
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Not applicable based on the computational nature of our study.

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* Statistical analysis methods should be described and justified
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* For each experiment, you should identify the statistical tests used, exact values of N, definitions of center, methods of multiple test correction, and dispersion and precision measures (e.g., mean, median, SD, SEM, confidence intervals; and, for the major substantive results, a measure of effect size (e.g., Pearson's r, Cohen's d)
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For Figure 2, individual data points are shown on the plots (Fig. 2D-F). Exact p values are reported except if p is <0.001. All relevant information is provided in the legend for Figure 2.

(For large datasets, or papers with a very large number of statistical tests, you may upload a single table file with tests, Ns, etc., with reference to sections in the manuscript.)

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* Indicate how samples were allocated into experimental groups (in the case of clinical studies, please specify allocation to treatment method); if randomization was used, please also state if restricted randomization was applied
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Not applicable based on the computational nature of our study.

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* We encourage you to upload relevant additional data files, such as numerical data that are represented as a graph in a figure, or as a summary table
* Where provided, these should be in the most useful format, and they can be uploaded as “Source data” files linked to a main figure or table
* Include model definition files including the full list of parameters used
* Include code used for data analysis (e.g., R, MatLab)
* Avoid stating that data files are “available upon request”

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All computer code is available at <http://modeldb.yale.edu/267309> and at <http://prescottlab.ca/code-for-models>. Key parameter values are provided in Supplementary File 1. Other parameter values are identified in the Methods. Source data is provided for Figure 2.