

Supplementary Information

1. Patch-electrode voltage under local heating protocols.

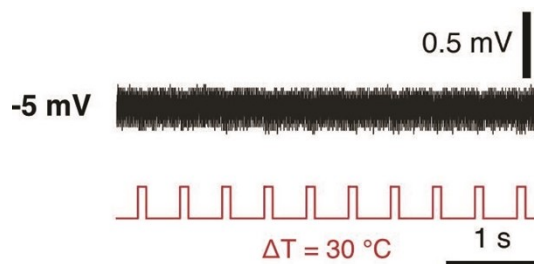


Fig. S1. Changes in the glass electrode voltage under a 2 Hz train of 100 ms heat pulses ($\Delta T_{\text{heat}} = 30\text{ }^{\circ}\text{C}$). The distance between electrode and DHT was $\sim 1\text{ }\mu\text{m}$.

2. Influence of 640 nm laser irradiation on electrophysiological properties of cells.

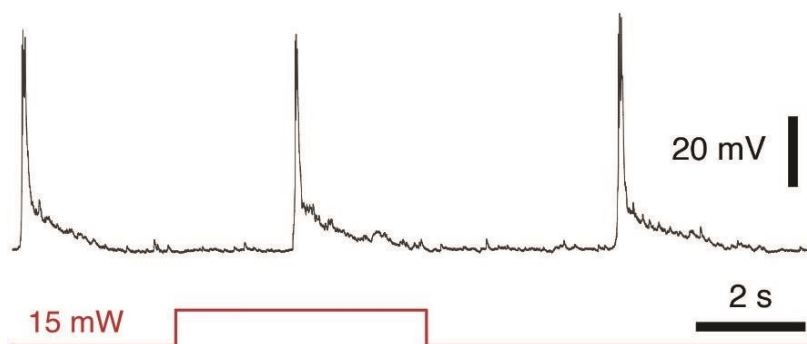


Fig. S2. Application of 15 mW 5s laser pulse alone in the absence of DHT at focal point did not produce any electrophysiological response in neurons.

3. Resistance of neurons to non-physiological temperature at microscale.

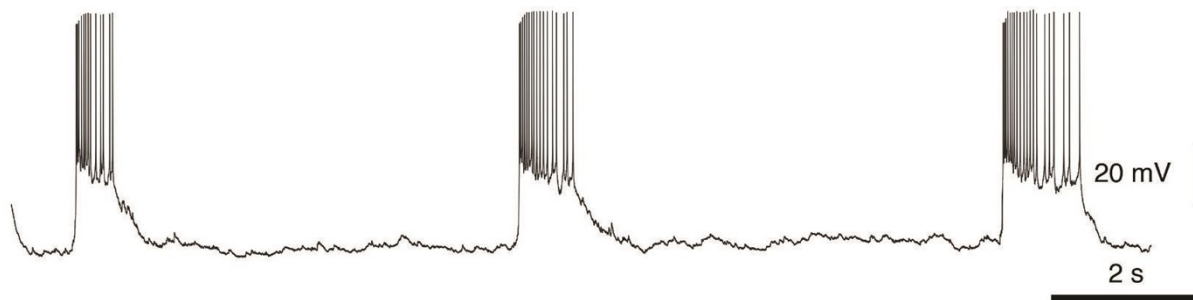


Fig. S3. Membrane potential and burst activity in a current-clamped neuron 30 min after cessation of the sequence of ten heat pulses with duration 1 ms and $T_{\text{heat}} = 80\text{ }^{\circ}\text{C}$.

4. Optical images of neurons after different treatments.

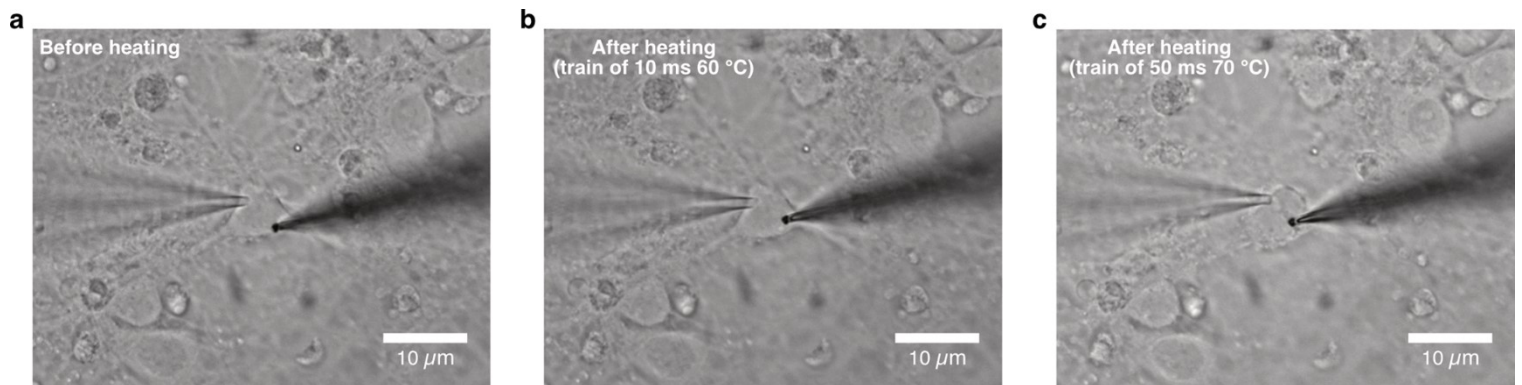


Fig. S4. DGC-optical images of neurons after different heat protocols: (a) neuron without thermal exposure, (b) neuron 20 minutes after several trains of short (<10 ms) 60 °C pulses and (c) neuron 5 minutes after a sequence of 50 ms 70 °C pulses.

5. Thermal exposure of neurons to high temperatures with DHT1.4.

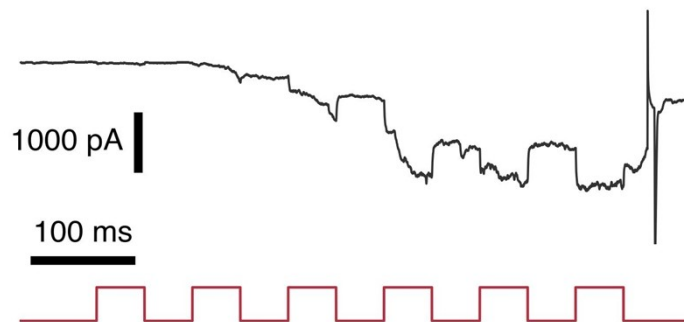


Fig. S5. TCM-induced currents recorded in voltage-clamped neurons evoked by 10 Hz train of 50 ms 70 °C heat pulses.

6. Depolarization currents in neurons with short thermal pulses.

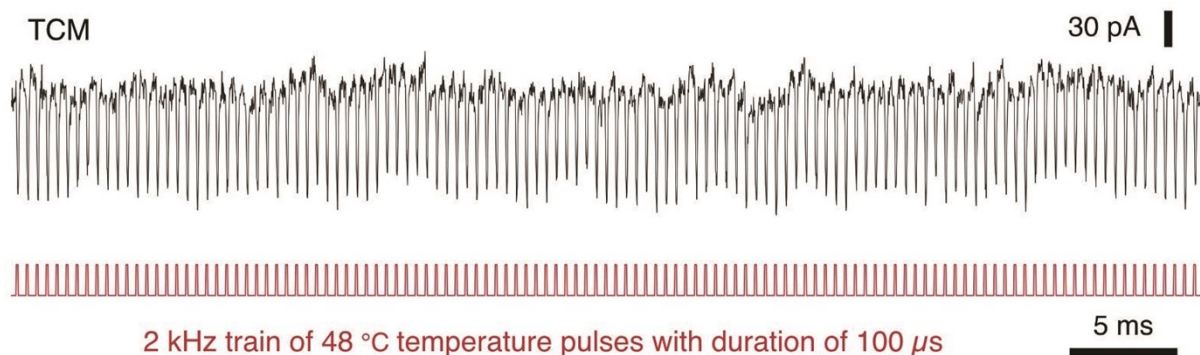


Fig. S6. TCM-induced depolarization currents in cultured neurons at a 2 kHz train of 100 μ s heat pulses ($T_{\text{heat}} = 48$ °C) produced by DHT1.4.

7. Thermal excitability of neurons with DHT0.5.

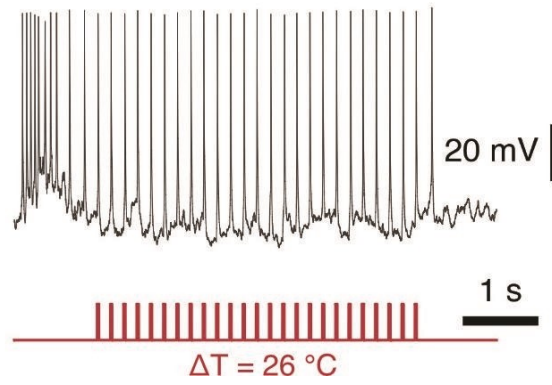


Fig. S7. TCM-induced generation of action potentials in cultured neurons at a 5 Hz train of 25 ms heat pulses ($\Delta T_{\text{heat}} = 26\text{ }^{\circ}\text{C}$) produced by DHT of 500 nm in size.