Review of: "Depolarization block of interneurons"

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This short paper demonstrates that a computational model of hippocampal interneurons can show a well know property of real neurons called ‘depolarization block’. The common idea is that such a mechanism silences output from the neuron till subsequent hyperpolarizing currents bring the membrane potential back below the threshold for the ‘block’.

Unfortunately as far as I know the consequences of this ‘block’ is a continuing firing of the axon – no longer visible at the soma. In Eccles’ experiment on motor neurons the action potential initiation site simply moves down to the next node of Ranvier, so although firing is absent at the soma the muscle continues in tetanus. Similarly when dopamine cells are silenced in ‘depolarization block’ the dopamine metabolism is still in overdrive in the striatum.

Although the axonal activity is not part of the model it might be worthwhile for the authors’ commenting on the consequences for the next cell in the network. It is not obvious that the downstream cells receive no – or even reduced - input from the powerful depolarization of the cell body. A constant depolarization at the cell body may act as a stimulation farther down the axon.