Review of: "Depolarization block of interneurons"

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Potential competing interests: No potential competing interests to declare.

The study by Brunello Tirozzi et al. provided a mathematical model attempting to decipher the electrophysiology of fast-spiking interneurons in the hippocampus. They conducted simulations with depolarizing input currents and synaptic events on the fast-spiking neurons and found that an inhibitory synaptic current could reactivate neural activity within a specific range of synaptic and depolarizing currents.

Understanding the interneural activity in neural networks and exploring the integrative mechanisms involved is crucial. A computational study of a working model of interneurons can provide insights into the physiological and pathophysiological processes of cognitive behavior. The reviewer has some concerns regarding the study.

1. In what way can the mathematical model of fast-spiking basket interneuron be verified in a physiological context?
2. The authors provided the g_{syn} simulating GABAa on the interneuron. However, it would be helpful if they also simulated g_{syn} of excitatory receptors such as AMPAR and NMDAR on the interneurons. This is because the presynaptic fibers targeting fast-spiking interneurons in CA1 are mainly glutamatergic ones.
3. Can the authors explain the differences in mathematical models used for interneurons and principal neurons?
4. The hippocampus is a complicated network of neurons with various populations. The reviewer was curious about how this mathematical model connects to physiological processes such as synaptic integration and plasticity.