

# Review of: "Depolarization block of interneurons"

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Potential competing interests: No potential competing interests to declare.

Overall, the paper appears to provide valuable insights into the behavior of hippocampal interneurons and the role of depolarization block. Methods and results are presented in a clear and organized manner, while the discussion summarizes the key findings and paves the way for further investigation. With the suggested additions below, the paper can enhance its impact and contribute more comprehensively to the field.

- Highlight why the chosen model, a modified version of a Hodgkin-Huxley model, specifically describes the behavior of an interneuron. Does the fast dynamic of the activation variable lead to the fast-spiking characteristic of interneurons? Are there any other biophysical features captured by this model? This should be explicitly discussed in the text.
- It would be helpful to provide a brief definition of the terms Andronov-Hopf bifurcation, saddle-node bifurcation and Hodgkin's excitability Class 1, for better understanding, especially for readers less familiar with the field.
- The connection between depolarization block and memory diseases, such as Alzheimer's disease, is mentioned, highlighting potential implications for understanding these conditions. Consider discussing the broader implications of depolarization block in neural circuit function or dynamics, beyond memory diseases. Are there other conditions or phenomena that may be affected by depolarization block?
- Elaborate on the implications and potential applications of the excitatory effect of inhibitory GABA<sub>A</sub>-mediated synaptic current during depolarization block. How does this finding relate to the existing literature or clinical perspectives? What are the possible implications for information processing in neural networks?
- Discuss the limitations of the study and potential directions for future research. Are there specific aspects of the interneuron model or synaptic plasticity that could be further explored?