Review of: "Depolarization block of interneurons"

Viktor Szegedi[1]

1 University of Szeged

Potential competing interests: No potential competing interests to declare.

The manuscript of Tirozzi et al. examines the spiking behaviour of a single hippocampal basket cells during a step current application. The main finding, that BCs also exhibit depolarisation block, may have importance in normal brain physiology and in disease.

The study has the potential to raise interest, however the findings are rather limited at the present form.

Major comments:

- Basket cells were shown to form autapses in the CA1 region (e.g. Cobb et al, 1997, Pawelzik et al., 2003) providing monosynaptic self-inhibition. This modelling does not consider these autapses.
- Hippocampal basket cells are connected with electrical synapses, which enhance population synchrony. Although this is a single-cell model, a neuron is never active in isolation. It would be interesting to see if the other fast spikers modulate the bifurcation diagram through gap junctional conductivity. For example, during gamma frequency.
- Table 1 says that ENa is -55 mV. Is it really correct?
- The authors used two inhibitory synaptic dynamics in their modelling. The Esyn parameter is different for the deterministic and stochastic model. Why?

Minor comments:

- Table 3 is not English.
- Fig 3. shows that if the gsyn is increased for the incoming GABA connections, then number of spikes is reduced to a depolarising current injection. The authors discuss this effect as being solely due to volage inhibition. Please consider shunting inhibition of activated GABAA Rs as well.