

Review of: "Proton Mechanisms of Neurotransmission and Calcium Signalling for Impulse Initiation, Development, and Propagation"

Marco Luppi¹

¹ University of Bologna

Potential competing interests: No potential competing interests to declare.

This paper, by Dr. Giuliano Molinari, represents a very interesting discussion of the greatly underestimated role protons may have in neurotransmission, beside classical neurotransmitters. It seems to be very intriguing that protons are involved in local biochemical changes, necessary to better explain the many processes that still are not completely interpreted by classical models of neurotransmission. Congratulations to Dr. Molinari for this contribution, worth considering by neurophysiologists.

I have only some suggestions for Dr. Molinari, with the intent to contribute to the amelioration of the paper.

Paragraph 2.2 – In the previous paragraph, there was a fine analysis of the ionic and diffusion characteristics of Na⁺, compared to protons. Since Ca²⁺ ions are presented here as strictly related, in their functioning, to protons, I suggest Dr. Molinari implement this paragraph describing the ionic, dimensional, and diffusion characteristics of Ca²⁺ as well, in parallel to what was done for Na⁺. Moreover, in the 14th line of this paragraph, within the sentence that follows the citation of (Nicholls & Chalmers, 2004), “trivalent ions” are cited but without any example. I suggest to add at least one example of trivalent ions involved.

Throughout the whole text, citations are not exactly in the same style; I suggest setting this incongruency.

Following are some specific suggestions:

- Page 3 – Last line, “...a large variety of channels and receptors, such as...” – I suggest adding a colon (“:”), then the sentence will end “...such as:”
- Page 8 – Line 9, “...below in subsection 2.4.” – I guess it's “subsection 2.5”
- Page 8 – I find the last sentence of paragraph 2.4 (“For all these cases...”) a bit confusing; I suggest Dr. Molinari try to rewrite the text in a different way
- Page 9 – Lines 4-6, it is not clear to me why the rapid and costly recycling of Glu and GABA into vesicles is a sign of their importance for proton production, and not simply for their importance as common neurotransmitters; maybe this consideration should be better developed
- Page 9 – Line 28, “...the observation of Soto et al...” – I suggest citing the paper again, adding the publication year here

- Page 10 – Line 5, after “2021),” a period should replace the comma.