Review of: "Impending role of hippocampal neurogenesis in the development of chronic epilepsy following seizures after Kainic acid and Pentylenetetrazol treatment"

Mikhail Bibov[1]

1 Rostov State Medical University

Potential competing interests: No potential competing interests to declare.

The paper entitled " Impending role of hippocampal neurogenesis in the development of chronic epilepsy following seizures after Kainic acid and Pentylenetetrazol treatment " deals with the study of alterations in proliferation of neurons and glial cells associated with the development of epilepsy and kindling in two pharmacological models of kainic acid- and pentylenetetrazol-induced epileptic seizures. The paper is quite thorough and well-written, and the problem settled is challenging as the molecular mechanisms of epilepsy development are still poorly understood. The research is carried out with modern approaches and techniques properly chosen to evaluate the level of apoptotic cells, as well as cell proliferation and differentiation. The data obtained clearly demonstrate that treatment of animals with KA and PTZ resulted in an increase in the number of apoptotic cells, BrdU- and NADPH-d-positive cells. Changes in the levels of neurogenesis and gliosis, as well as in the expression of BDNF and NGF, are also demonstrated at two time points. These findings may contribute importantly to the development of new approaches to epilepsy treatment.

However, there are some shortcomings that should be clarified, and some corrections are needed:

1. The introduction should be written more clearly. I suggest that contemporary achievements in the understanding of molecular principles of epilepsy pathogenesis and treatment, as well as the research gaps, should be described in more detail.

2. Protocols for Nissl staining, Fluorojade B staining, and TUNEL should be described to make the experiments repeatable.

3. In the "Results" section, when describing changes in BDNF and NGF expression, the authors write: " An increase in NGF immunoreactivity was observed in KA (Fig. 6) and PTZ-treated brains after 48 hr of kindling. NGF expression decreased after 8 weeks of KA and PTZ administration compared to 48 hr. Immunoblotting showed increased expression of NGF in Lanes 2 and 4 after 48 hr of KA and PTZ administration, respectively, as compared to control (lane 1). In lanes 3 and 5, a noteworthy reduction in NGF expression was evident after 8 weeks". However, Fig. 7 shows these lines vice versa. Moreover, it would be appropriate to accompany the data of the Western blot with RT-PCR analysis expression in order to reveal not only changes in the levels of BDNF and NGF in cells, but also the activity of the corresponding genes.

4. It's better to provide the data for Fluorojade-B staining, GFAP, NGF, and BDNF not only with the images but also with

diagrams to make them more readable.

5. Some references in the list may be updated with newer ones.

6. Language editing is needed in places.

On the whole, I believe that this paper is worthy of publication after major revision.