

5<sup>th</sup> International Conference on

# BRAIN DISORDERS AND THERAPEUTICS

November 29-30, 2017 | Madrid, Spain

## The effect of EMF on behavior manifestation of seizure activity in genetically epilepsy-prone rats

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In the present study, we examined the effect of acoustic range of electromagnetic field (EMF) on the behavioral manifestation of seizure in genetically epilepsy-prone rats (GEPRs) of Krushinsky Molodkina strain. A five days exposure to EMF (10000-15000 Hz frequency, 1, 5 m/Tesla, during 20 min) resulted in partial or complete suppression of behavior activity in GEPRs. Besides, on the background of EMF the latency period of first wild run was increased and on the same conditions, duration of wild run was decreased. The anxiety degree in irradiated GEPRs versus the controls (GEPRs without magnetic stimulation) was decreased, whereas the locomotion/exploratory activity were increased. Audiogenic stimuli obtained in GEPRs changed the ECoG activity of somatomotor cortex only in audiogenically kindled animals. Findings of this study suggest that the regulation of the behavioral manifestation of seizure in GEPRs does not involve the cortex; mainly, it is regulated by brainstem structures. The EMF can modulate ponto-geniculo-occipital (PGO) waves. On the other hand, PGO waves have a possible inhibitory influence on EEG seizure activity. Increased number of PGO spikes in animals exposed to auditory stimulation attributed to the anatomical proximity of the structures involved in acoustic signal processing. Besides, acoustic stimulation could promote the release of acetylcholine in the brainstem structures involved in the initiation of PGO waves. Perhaps, these influences mediated by changing in membrane ion channel permeability, which occur under the effect of low-frequency EMF. Also, we suggest that EMF exposure on brain results changes in electric and current density fields, accompanied by modification of synaptic activity, modes of synchronous bursts of neuronal populations, ion dynamics, and other phenomena. Thus, acoustic range of EMF can apply for suppression of behavioral manifestation of seizure.

### Biography

Nato Bukia has completed PhD from Experimental Endocrinology and Chemistry of Hormones Institute in Russia, Specialty in Human and Animal Physiology, 1987. She has published more than 38 papers in reputed journals. She took participation in several research projects, as principal Investigator. Now she works in Ivane Beritashvili Center of Experimental Biomedicine. She is a member of IBRO and regional physiology society.

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