

## Annotation

The study of effective remedies against neurodegenerative disorders showed neuroprotective nature of flavonoids - an antioxidant of plant origin. Quercetin is one of the widespread representatives of this group and the interest of scientists towards it contributed to numerous biological abilities of Quercetin. Many of its pharmacological effects are known: anti-inflammatory, anti-bacterial, anticancer, but the use of Quercetin has been limited due to its poor bioavailability. The modern approach to solve the problem is usage of nanoparticles (NP). It is shown that nanoparticles protect, control the release and increase the influence of bioactive compounds to the target area.

The goal of the research was in electrophysiological experiment to determine quercetin and q-mnp effects on epileptiform activity, generated by an intra hippocampal application of kainic acid (KA) and the memory disorders due to epileptic status of KA in behavioral experiments.

The experiments were carried out on adult 10-12 week old white laboratory rats. In the rats anesthetized with ketamine and placed in the stereotaxic chamber an epileptiform activity, induced by KA intra hippocampal injection were registered and the effects of preliminary systemic administration into caudal vein on the duration and generation frequency were estimated. Quercetin/q-mnp effects on behavioral disorders due to KA were also evaluated in the open field and T-maze. The registration and analysis of neuronal activity of the hippocampus were done using a computer program Chart 5.5. The statistical processing of the data obtained was performed using the PRIZM program.

The electrophysiological experiments have shown that q-mnp reduces the amplitude of total neuronal activity on the side of an external static magnetic field and evokes the increase of discharge number regarding the indices of background activity. At the background of exposure of magnetic field a preliminary systemic administration of q-mnp evokes the decrease in the duration of KA generated epileptiform discharges, as well as frequency indices. Quercetin independently reduces the duration of epileptiform discharges, but statistically reliably increases the frequency of discharges. The behavioral experiments have shown that a magnetic field as well as magnetic nanoparticles (without quercetin) do not evoke the changes in learning indices. Q-mnp managed by external magnetic field makes the learning easier in control rats, while in KA managed rats it evokes the correction of memory disorder due to epilepsy.

Based on the obtained data we can conclude that the connection of quercetin to magnetic nanoparticles and the management of q-mnp by means of external magnetic field increase the effectiveness of quercetin against the disorders evoked by epileptic status.