

BIOSENSORS FOR DETECTING ION CURRENTS IN BIOLOGICAL SYSTEMS

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Introduction. Ion channels are represented as integral membrane proteins that control the direction of several ions (Na^+ , K^+ , Ca^{2+} and Cl^-) through lipid membranes in cells. Ion transport through an open ion channel is determined by the electrochemical gradient for specific ions through the membrane in question [1]. To date, it has been established that ion channels contribute to a number of important cellular functions [2]. However, the nature of signal transmission through ion channels remains unclear, so the development of bioengineering strategies to expand knowledge is relevant. This research is aimed at developing a system that allows studying extracellular communications and interactions through ion channels.

Main part. The developed system is based on electrophysiological methods, which consist in recording potentials and currents flowing through the membrane of an excitable cell [3, 4]. The extracellular current was measured using ion-selective electrodes (ISEs). Hydrohelium ordered structures were used for cell localization. The main idea of the experiments was to activate the calcium channels of cellular systems and detect the propagation of ion currents using the developed biocompatible system.

Conclusion. As a result of the studies carried out, it was shown that calcium-selective electrodes are suitable for studying calcium channels. Thus, the developed system can be promising for monitoring cellular interaction.

References:

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