

THE RESEARCH OF CALCIUM OSCILLATIONS IN PLATELETS

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Platelets are nuclear-free biconvex cellular blood fragments that play a key role in stopping bleeding - hemostasis, they are able to attach to damaged tissues and to each other forming a platelet aggregate tube. The ability to activate, i.e. a quick and in extremely rare cases irreversible transition to an active state, is the main function of a platelet. This ability is provided by calcium signaling - signal transmission inside the cell provides an increase in the level of calcium in the cytoplasm. The ability of cells to receive signals from outer space, located outside the plasma membrane, and they are fundamental to life. The signal itself is information that recognizes and accepts specific receptors and turns into a cellular response, which is a chemical process.

Level of cytoplasmic calcium in single platelets during the time before and after activation by thrombin or ADP in various concentrations was experimentally obtained. The research of calcium signaling use various tools, such as spectral analysis or level of cut off , and the search for significant differences in them.

As a result of this work, we obtained that, despite the fact that the calcium signaling of platelets has the form of oscillations with a stable amplitude, their frequency and shape are not regular enough for the direct application of Fourier spectral analysis. The cut off algorithm can be used to compare signals and the relationship between the signal and the conditions (activator concentrations, type of activator).