

ФИНАНСИРОВАНИЕ РАБОТЫ

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СОБЛЮДЕНИЕ ЭТИЧЕСКИХ СТАНДАРТОВ

Экспериментов с участием животных или людей в качестве объектов исследований авторы не проводили.

КОНФЛИКТ ИНТЕРЕСОВ

Авторы заявляют, что у них нет конфликта интересов.

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Local Mechano-Dependent Calcium Influx Controls the Activity of Calcium-Dependent Potassium Channels of Big and Small Conductance in Human Lymphoma Cells

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Burkitt's lymphoma is an aggressive and fast-growing form of non-Hodgkin's lymphoma with the highest invasive potential of all types of lymphomas. Calcium ions are one of the main intracellular signaling messengers that control the dissemination of cancer cells in the body. Burkitt's lymphoma is a common cell model for research aimed at understanding the pathophysiology and mechanisms of treatment of lymphomas, but little is known about the physiological pathways that provide calcium influx from the extracellular environment to the cytoplasm of these cells. In current work, we performed, for the first time, electrophysiological studies of native calcium-permeable ion channels involved in the cellular response to mechanical stimulation of Burkitt's lymphoma Raji cells. Registration of ion currents in the cell-attached configuration allowed us to detect mechanosensitive calcium-permeable channels (SAC-channels), which are activated in response to stretching of fragment of the cell membrane. Analysis of record-

ings of single ionic currents revealed the potential involvement of SAC channels in the transport of calcium ions in Raji cells. We have shown that the local entry of calcium via the SAC channels controls the activity of two types of calcium-dependent potassium channels – BK and SK, which do not have their own mechanosensitivity. The results demonstrate, for the first time, the participation of SAC channels in the formation of physiologically significant calcium transport pathways that regulate the activity of calcium-dependent molecules in Burkitt's lymphoma cells.

Keywords: cell membrane, patch-clamp, mechanosensitive channels, local calcium signaling, human lymphoma, Raji cells, calcium-dependent potassium channels