СОБЛЮДЕНИЕ ЭТИЧЕСКИХ СТАНДАРТОВ

В работе не проводили экспериментов на животных или людях.

КОНФЛИКТ ИНТЕРЕСОВ

Авторы заявляют об отсутствии конфликта интересов.

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Analysis of Possible Mechanisms of Endometrial Stem Cell Migration Suppression by Selective Chemical Activation of Piezo1 Mechanosensitive Channels

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We investigated the possible molecular mechanisms that could mediate the suppression of cell motility of human endometrial mesenchymal stem cells (eMSCs) by selective chemical activation of mechanosensitive Piezo1 channels with small heterocyclic molecule Yoda1. According to the literature data, stimulation of Piezo1 activity in the plasma membrane can lead to the activation of various signaling pathways, in particular, associated with the activity of TRPV4 channels or with the release of intracellular ATP into the extracellular environment and subsequent triggering of purinergic cascades. We hypothesized that Piezo1-dependent activation of these signaling pathways may contribute to the inhibition of eMSC migration by selective Piezo1 agonist Yoda1. Using polymerase chain reaction and immunofluorescent staining, TRPV4 expression was revealed in eMSCs at the mRNA and protein levels. At the same time, migration tests showed that inhibition of TRPV4 channels (with reagent HC067047) did not abolish the effect of decreased eMSC cell motility in the presence of Yoda1. Also, the addition of apyrase that catalyzes the rapid hydrolysis of ATP did not restore the migration potential of eMSCs decreased by Yoda1. The results obtained allow us to exclude the hypothesis of TRPV4- or ATP-dependent suppression of eMSC migration upon selective chemical activation of mechanosensitive Piezo1 channels; the prerequisites for the search for ionic mechanisms underlying the observed changes in the motility of endometrial stem cells are discussed.

Keywords: mechanosensitive Piezo1 channels, Yoda1, cell motility, endometrial stem cells, ATP, TRPV4