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Modelling of the receptor-ligand interaction in a single cell mode

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Abstract

Membrane-associated intrareceptor and ligand-receptor interactions are involved in intracellular signalling. Community of surface receptors represents extremely important target for modern therapeutics. Their developing evidently requires elaboration of effective screening platforms. In this study we suggest universal platform designed to test receptor-ligand interaction in a "single cell" mode. For this purpose we created a DNA vector utilizing modular structure of chimeric receptors. The whole platform was tested using myc peptide - anti-myc antibody counterpart, which is directly linked with regulation of cancer cell development. In this study we succeeded to obtain Jurkat cells transduced with cDNA coding for chimeric antigenic receptor containing extracellular scFv of the myc-specific antibody and human Fc fused with transmembrane anchor. We showed that chimeric receptor interacts with myc peptide in a "single cell" mode, which in turn leads to the activation of T cells. We further suggest that designed system can be used for any other receptor-ligand pair to detect their interaction directly on the cell surface. Elaborated platform may be applied for the widerange screening of the agents with therapeutic potential on the cell membrane ex vivo.

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Keywords

Cell membrane, Chimeric antigen T-cell receptor, Ligand-receptor interactions, Reporter cells