

Geometrically repatterned immunological synapses uncover formation mechanisms.

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Abstract

The interaction of T cells and antigen-presenting cells is central to adaptive immunity and involves the formation of immunological synapses in many cases. The surface molecules of the cells form a characteristic spatial pattern whose formation mechanisms and function are largely unknown. We perform computer simulations of recent experiments on geometrically repatterned immunological synapses and explain the emerging structure as well as the formation dynamics. Only the combination of in vitro experiments and computer simulations has the potential to pinpoint the kind of interactions involved. The presented simulations make clear predictions for the structure of the immunological synapse and elucidate the role of a self-organizing attraction between complexes of T cell receptor and peptide-MHC molecule, versus a centrally directed motion of these complexes.

Beteiligte Forschungseinheiten

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