The immunosuppressive activity of peptide fragments of vaccinia virus C10L protein and a hypothesis on the role of this protein in the viral invasion.

Autorzy

Alicja Kluczyk

Ignacy Z. Siemion

Zbigniew Szewczuk

Zbigniew Wieczorek

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Streszczenie

Our previous studies revealed that the 143-148 fragment of interleukin-1 receptor antagonist (IL-1 Ra) molecule with a Val-Thr-Lys-Phe-Tyr-Phe (VTKFYF) sequence inhibits the interleukin-1 (IL-1) interaction with its cellular receptor. The Val-Thr-Arg-Phe-Tyr-Phe (VTRFYF) sequence of the 322-327 fragment of the C-terminal domain of vaccinia virus protein related to the C10L vaccinia gene shows a very high homology to the 143-148 IL-1 Ra fragment, suggesting a similar inhibitory activity. To test this suggestion, we investigated the inhibitory activity of a series of synthetic peptides derived from 316 to 327 fragment of C10L on the interaction of IL-1 with its receptor. We also tested the peptides for their influence on the humoral and cellular immune response. The results indicate that biological activities of the C10L fragments are similar to those obtained for respective fragments of IL-1 Ra. The C-terminal domain of C10L protein can be easily folded into spatial structure similar to the crystallographic one of IL-1 Ra. Based on the crystallographic structure of IL-1 Ra, we constructed a 3-D model of the C10L protein. According to the model, the Val(322)-Asn(328) sequence is localized on the surface of the molecule and, therefore, it may be involved in the interactions with receptors. Our results indicate that the C10L viral protein can play an important role in vaccinia virus evasion of the host immune system. It may consist in the blockade of IL-1 receptors by the C10L protein, a homologue of the IL-1 Ra.

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