

On the peptide-antipeptide interactions in interleukin-1 receptor system.

Autorzy

Alicja Kluczyk
Marek Cebrat
Renata Zbozień-Pacamaj
Marek Lisowski
Piotr Stefanowicz
Zbigniew Wieczorek
Ignacy Z. Siemion

Rok wydania

2004

Czasopismo

Acta Biochimica Polonica

Numer woluminu

51

Strony

57-66

Kolekcja

Naukowa

Język

Angielski

Typ publikacji

Artykuł

Streszczenie

Interleukin-1 receptor antagonist (IL-1Ra) and vaccinia virus protein C10L share a VTXYFYF motif, with X being Lys or Arg residue, respectively. Peptides of such sequence compete successfully with IL-1 for the cellular receptor. A pair of complementary peptides, based on the Siemion's hypothesis on the periodicity of the genetic code (QWLNIN and QWANIN), and another pair, in which, following the Root-Bernstein theory, Lys was used as complementary amino acid to Phe (QWLKIK and QWAKIK), were investigated for the peptide-antipeptide interactions using mass spectrometry (ESI-MS) and circular dichroism (CD) methods. The CD measurements indicated some conformational changes, more pronounced in the Siemion's pairs, however, no heterodimer formation was found by MS. In the region of IL-1 receptor situated close to the position of IL-1Ra in the IL-1Ra-receptor complex, a KQKL motif is present, suggesting a possibility of complementary recognition of the Root-Bernstein type in the IL-1 receptor. The biological activity of the complementary peptides is similar to that of the original ones. They efficiently compete with IL-1 and show moderate immunosuppressive activity in humoral and cellular immune response. The inhibition of the IL-1-IL-1 receptor interaction may result from the complementary peptides acting as mini-receptors with affinity for IL-1.