

Shigella flexneri 3a outer membrane protein C epitope is recognized by human umbilical cord sera and associated with protective activity.

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Streszczenie

Shigella flexneri 3a is one of the five major strains of the *Shigella* genus responsible for dysentery, especially among children, in regions of high poverty and poor sanitation. The outer membrane proteins (OMP) of this bacterium elicit immunological responses and are considered a prime target for vaccine development. When injected into mice they elicit a protective immunological response against a lethal dose of the pathogen. The OMPs from *S. flexneri* 3a were isolated and resolved by two-dimension-SDS-PAGE. Two 38-kDa spots were of particular interest since in our earlier studies OMPs of such molecular mass were found to interact with umbilical cord sera. These two spots were identified as OmpC by ESI-MS/MS spectrometry. By DNA sequencing, the *ompC* gene from *S. flexneri* 3a was identical to *ompC* from *S. flexneri* 2a [Gene Bank: 24113600]. A 3D model of OmpC was built and used to predict B-cell type (discontinuous) antigenic epitopes. Six epitopes bearing the highest score were selected and the corresponding peptides were synthesized. Only the peptides representing loop V of OmpC reacted strongly with the umbilical cord serum immunoglobulins. To determine which amino acids are essential for the antigenic activity of the epitope, the loop V was scanned with a series of dodecapeptides. The peptide RYDERY was identified as a minimal sequence for the loop V epitope. Truncation at either the C- or N-terminus rendered this peptide inactive. Apart from C-terminal tyrosine, substitution of each of the remaining five amino acids with glycine, led to a precipitous loss of immunological activity. This peptide may serve as a ligand in affinity chromatography of OmpC-specific antibodies and as a component of a vaccine designed to boost human immune defenses against enterobacterial infections.

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