P1041

Abstract (poster session)

Recombinant outer membrane secretin PilQ406-770 as a vaccine candidate for serogroup B Neisseria meningitidis

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Neisseria meningitidis is a major causative agent of bacterial meningitis in human. Prevention of serogroup B meningococcal disease represents a particularly difficult challenge in vaccine development. PilQ is an antigenically conserved outer membrane protein which is present on most meningococci. This protein naturally expressed at high levels and is essential for meningococcal pilus expression at the cell surface. A 1095bp fragment of C-terminal of secretin pilQ was amplified by PCR from serogroup B N. meningitidis and cloned into prokaryotic expression vector pET-28a. Recombinant protein was overexpressed with IPTG and affinity-purified by Ni-NTA agarose. BALB/c mice were immunized subcutaneously with purified rPilQ406-770 formulated with either an outer membrane vesicle of serogroup B N. meningitidis or Freund's adjuvant. Serum antibody responses to serogroup A and B N. meningitidis whole cells or purified rPilQ406-770 and functional activity of antibodies were determined by ELISA and SBA, respectively. SDS-PAGE analysis showed that our constructed prokaryotic expression system pET28a-rPilQ406-770-BL21 efficiently produces target recombinant protein with molecular weight of 43 kDa. The output of rPilQ406-770 was approximately 50% of the total bacterial proteins. Serum IgG responses were significantly increased in immunized groups with PilQ406-770 in comparison with control groups. Antisera produced against rPilQ406-770 demonstrated strong surface reactivity to serogroup A and B N. meningitidis tested by whole-cell ELISA. Surface reactivity to serogroup B N. meningitidis was higher than serogroup A. The sera from PilQ406-770 immunized animals were strongly bactericidal against serogroup A and B. The strongest bactericidal activity was detected in sera from immunized group with PilQ406-770 formulated with OMV. These results suggest that rPilQ406-770 formulated with an outer membrane vesicle is a potential vaccine candidate for serogroup B N. meningitidis.