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Multiple antigen peptide consisting of B- and T-cell epitopes of F1 antigen of Y. pestis showed enhanced humoral and mucosal immune response in different strains of mice

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Yersinia pestis is the causative agent of the plague. F1 and V antigens are the major vaccine candidates. Three B-, one T-cell epitopes of F1 antigen with one palmitate residue at terminal amino group were assembled on a lysine backbone as multiple antigen peptide (MAP) using Fmoc chemistry. MAP was characterized by using SDS-PAGE, immunoblot and immunoreactivity with F1 sera MAP was entrapped in PLGA (polylactide-co-glycolide) microparticles and humoral, mucosal immune responses were studied after intranasal immunization with / without CpG ODN 1826 (CpG), murabutide and β 1,3 Glucan in different strains of mice. MAP specific serum and mucosal washes were measured for IgG, IgA, SIgA and IgG subclasses in three strains. F1-Map showing high serum antibody and mucosal IgG and IgA peak antibody titres. MAP with CpG showed significantly high ($p<0.001$) peak antibody titre ranging from 102,400 to 204,800 for IgG and 12,800 for IgA. High mucosal SIgA and SC component levels confirm enhanced mucosal response in intestinal washes and lung washes. Significant immunoreactivity of MAP antisera with individual peptides of MAP was observed in all formulations. Measurement of IgG, IgA and SIgA specific activity correlate with peak antibody titres of respective antibody. Predominantly IgG2a subclass was observed in CpG formulation but in other formulation a mixed (IgG1 and IgG2a) response was observed. Immunoadjuvant property was found in the order of: CpG > Murabutide ≥ β 1, 3 Glucan > MAP only. T-cell proliferation and cytokine secretion was studied in mice immunized with different formulation in microsphere delivery. F1-MAP with CpG-ODN showed enhanced T-cell proliferation and Th1 cytokine. The same forumuation showed perforin, granzye and IFN-γ secretion from CD4+ and CD8+. Present study highlights the importance of multiple antigen peptide of F1-antigen with CpG as an adjuvant for effective vaccine development against plague infection.

Biography

Dr. D.N. Rao is currently the Professor of Biochemistry, AIIMS, New Delhi. His is working in the same institute for the last 33 years. He research interest are Biochemistry and immunology of infectious diseases. He has guided more than 20 Ph.D. and published more than 100 papers in National & International jouranals. He is recipient of many National Awards and member of many societies.

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