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Novel non-pyrogenic hydrophobized norAbuMDP and norAbuGMDP analogues for construction of proteoliposome vaccines

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Abstract

Nickel-chelating nanoliposomes represent a versatile platform for the construction of self-assembling proteoliposome vaccines. New non-pyrogenic hydrophobised norAbuMDP and norAbuGMDP analogues were incorporated into proteoliposomes as adjuvants. Immunomodulatory activity was compared with Alum or MDP in experimental mice immunized by intradermal route with recombinant Candida albicans Hsp90 or Borrelia burgdorferi OspC. Using ELISA deteremination of antigen specific antibody isotypes we confirmed that for each of the tested norAbuMDP and norAbuGMDP derivates (MT01 - MT08), substantially different Hsp90- and OspC-specific antibody titers of individual isotypes were detected. Although the strongest antibody response was obtained after immunization with both antigens plus Alum, dominating isotype was consistently of IgG1 isotype. Experiments identified that some MDP analogues are optimal for the elicitation of Th1- and another ones for Th2-type of antigen-specific immune responses. For example immunization with rHsp90 with MDP analogues MT03, MT07 and to a lesser extent MT06, MT05, and MT02 exhibited a high efficacy in elicitation of Hsp90-specific titers in IgG2a and IgG2b isotypes indicating Th1 polarization of the specific immune response. Furthermore MT-adjuvanted OspC proteoliposomes surpassed Alum with respect to OspC-specific titers in IgG2a, IgG2b isotypes when MT06 was used and IgG3, IgM isotypes when MT05 was used. The Th1/Th2 polarization was consistent with IFN-γ and IL-4 production by antigen-stimulated splenocytes in ELISPOT. Furthermore MT exhibited better adjuvanticity than MDP and proved themselve as nonpyrogenic. This concept represents a new promising platform for construction of recombinant vaccines

Biography

Milan Raska has completed his Ph.D at the age of 35 years from Palacky University, Olomouc, Czech Republic and postdoctoral fellowship from University of Alabama at Birmingham, USA. He is Associate Professor of immunology at Faculty of Medicine and Dentistry, Palacky University, Olomouc, Czech Republic. He has published more than 37 papers in reputed journals.