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Using monoclonal antibodies to understand the molecular basis for the cross bactericidal activity of NHBA antigen

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The Neisserial Heparin Binding Antigen (NHBA) is a protective antigen of N. meningitidis and is one of the components of the recently licensed vaccine Bexsero. NHBA was demonstrated to be an important virulence factor and to be able to elicit a robust immune response in humans against meningococcal strains expressing homologous and heterologous NHBA peptides. In order to better understand the cross protective nature of NHBA we performed a screening with the purpose to obtain monoclonal antibodies (mAbs) to be used as tools in the process of characterization. Mice were immunized with different forms of recombinant NHBA peptide 2, the same peptide present in the Bexsero formulation. When tested in the SBA assay, two of the new mAbs displayed bactericidal activity and other two mAbs were bacteriostatic against meningococcal strains expressing the homologous protein. Antibody binding and antibody affinity were measured on the recombinant protein by enzyme-linked immunosorbent assay (ELISA) and Surface Plasmon Resonance (SPR) experiments, respectively, whereas Fluorescence-activated cell sorter (FACS) analysis was used to detect the native protein on bacterial surface. Cross-bactericidal activity was assayed by testing the selected mAbs on a panel of MenB strains expressing different NHBA peptides. Finally, a plethora of epitope mapping techniques, including protein chip analysis on NHBA fragments and Hydrogen-Deuterium Exchange (HDX-MS) were adopted to precisely map the position of the recognized epitopes. By this approach we have mapped protective epitopes on NHBA and studied their possible role on NHBA cross bactericidal activity.

Biography

Facciotti C, Biologist has a PhD in Science and worked at Novartis Vaccines in Siena (Italy) since 2005 in the Protein Biochemistry Unit at the Research Center. She is specialized in purification of recombinant proteins from E. coli and their characterization. She has done analytical studies on purified proteins as SE_UPLC/HPLC and RP_HPLC for protein integrity/purity and SCK for the protein/antibodies interactions by BiacoreT200.

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