Abstract

The plasmamembrane of mammalian spermatozoa that contains specific antigens undergoes remodeling during epididymal maturation . The epididymal maturation process mainly involves the apparent loss of antigenicity of spermatozoal surface molecules or appearance of new antigen on the sperm surface from the surrounding environment . All these phenomenon direct the spermatozoa to acquire the ability to interact with egg, other events like capacitation and acrosomal exocytosis are absolutely essential for this sperm egg interaction . To understand the involvement of the antigens in the event of fertility as well as the cause of infertility of male and female , the isolation and characterization of the sperm antigens are essential. Two sperm membrane proteins from goat spermatozoa have been purified to homogeneity. SMA2 antigens is maturation – associated antigen , always appears as a doublet form in SDS– PAGE. By 2D – gel eletrophoresis this doublet was separated and showed the same molecular mass. This antigen is heavily glycosylated. By different deglycosylation experiment the glycocomponent of SMA2 is disrupted . To disrupt the saccharide moiety the antigen was treated with $NaBH_4$, TFMS and periodate oxidation . By $NaBH_4$ treatment a 44kDa protein band is generated .By the treatment of this agent it is suggested that the removal of the saccharide branching did not abolishes the original immunoresponsiveness of the antigen and the protein part is immunoreactive. In oder to generate the immunoreactive fragments, the purified SMA2 antigen was subjected to limited proteolysis by trypsin , chymotrypsin and pronase . The SMA2 antigen was incubated with different proteases for different time intervals. At 15 minutes incubation . a smaller molecular weight fragment (36kDa) was generated by pronase which was found to be immunoreactive and also free of suger moiety. The site of synthesis of SMA2 protein and experssion of its antigenicity occurs at different places. It was found earlier the antigenicity of SMA2 was expressed when the cell enter into the caput epididymis . The radio -isotopic ^{35} S methionine incorporation studies showed that the greatest amount of protein synthesis took place in the retetestis sperm in comparison to the testicular and caput epididymial spermatozoa.

The funtional role of the SMA2 antigen was evaluated by assessing the capacitation and acrosome reaction in presence and absence of antibody which is raised against the SMA2 antigen in rabbit . The binding of the antibody inhibits the induction of acrosome reaction. Moreover , it is found that SMA2 is phosphorylated *invivo* during the capacitation and acrosome reaction . Other sperm membrane protein hbp30 have the heparin binding sites and also plays a role in the induction of capacitation and acrosome reaction.