MONOCLONAL ANTIBODIES DETECT SPERM ANTIGENS IN SEMINAL STAINS

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INTRODUCTION

Monoclonal antibodies that have proved to be excellent tools in different fields of medicine may as well serve to detect sperm antigens in seminal stains. The fact that we are able to produce antibodies which recognize a specific antigen determinant group is due to Köhler and Milstein (1975) who succeeded in obtaining monoclonal antibodies with cell fusion between myeloma cells and spleen cells of immunized mice.

In order to detect seminal stains searching techniques are of great importance in daily forensic casework as they allow to proceed in an economic way when a big amount of stains is to be analyzed and this analysis is carried further on with other expensive techniques like DNA-Profiling.

The acid phosphatase test as the most widespread searching technique to detect seminal stains shows lack of specifity, other searching methods having an even poorer sensitivity (Scheithauer 1988).

Our method based on monoclonal antibodies is intended to show high specifity as well as high sensitivity.

MATERIAL AND METHODS

BALB/c mice were immunized with human sperms. After repeating this procedure twice the obtained spleen cells were fused with myeloma cells. After using the limiting-dilution-technique monoclonal antibodies resulting from the hybridoma technique detected different antigens of human sperms.

After looking for cross-reactivity with a panel of human tissues and biological fluids no cross-reactivity or false positive results could be achieved with two different monoclonal antibodies showing specific reaction with acrosomal parts of spermatozoa.

By way of the pre-embedding immunogold-staining method we could show the precize localisation of the immunologic reaction between our monoclonal antibodies TÜS 1 and TÜS 19 and the sperm antigen. Immunelectronmicroscopy reveals that the antigen to antibody-reaction takes place (see Fig. 1) in the inner compartment of

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the acrosomal part of human sperm.

To detect sperm antigens seminal stains were washed with PBS. Unspecific reactions were blocked by addition of 5% milk powder. After another wash with PBS the monoclonal antibody was added. A POX-conjugate 1:20 was added after another PBS wash; before stopping the reaction with aqua dest. 4-Cl-1-Naphtol was added.

RESULTS AND DISCUSSION

The monoclonal antibodies detecting seminal stains are being tested in current forensic casework in our laboratory. Besides we perform our experiments also on dried seminal stains produced artificially and stored for months at room temperature. Whileas the artificially produced stains show an intensive blue stain when positive, we do not always obtain a satisfactory result when analyzing cotton wool cloths from casework. Nevertheless we are working on the improvement of the method. For the future a combination of monoclonal antibodies against seminal vesicle specific antigens (Herr et al 1987) and against sperm antigens seem to be extremely promising to detect seminal stains.

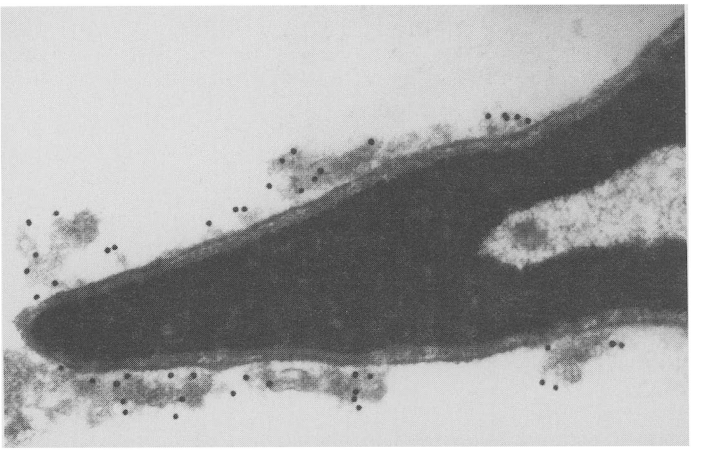

Figure 1: Pre-embedding gold staining of MOAB TÜS 1. Electron microscopy reveals the binding-site in the acrosomal part of human sperm

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