Journal of Andrology, Vol 12, Issue 5 305-314, Copyright © 1991 by The American Society of Andrology

JOURNAL ARTICLE

Use of neonatal tolerization and chemical immunosuppression for the production of monoclonal antibodies to maturation-specific sperm surface molecules

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Mammalian sperm acquire functional maturity as they move from the caput to the cauda epididymidis. Changes occur in the protein/glycoprotein composition of the sperm plasma membrane during this time, and may be essential to the maturation process. The production of monoclonal antibody (Mab) probes to the maturation-specific molecules has been difficult since new proteins comprise a minor portion of total membrane proteins. This report describes a protocol for enhancing the production of Mabs to maturation specific molecules. By injecting neonatal mice with caput epididymal sperm plasma membranes, in combination with chemical immunosuppression at adulthood, the mice were made tolerant to the antigens expressed on the caput sperm membranes. Subsequent immunization with cauda epididymal sperm plasma membranes allowed the production of Mabs to the maturation-specific moieties without the necessity for extensive antigen purification procedures. The majority of the resulting Mabs recognize cauda, not caput, epididymal sperm plasma membranes as determined by enzyme-linked immunosorbent assay (ELISA), immunocytochemistry on unfixed cells, and Western blot analyses, even though the protein profile from caput epididymal sperm plasma membranes is very similar to that from cauda membranes. The five Mabs described also recognize cauda fluid antigens, suggesting that the maturational changes on the sperm plasma membranes arise from interactions with the epididymal fluid. Use of the tolerization/immunosuppression protocol has provided Mab tools to assist in the study of sperm maturation during epididymal transit.

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