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JOURNAL ARTICLE

Anti-bull sperm monoclonal antibodies: I. Identification of major antigenic domains of bull sperm and manifestation of interspecies cross-reactivity

J. D. Ambrose, R. Rajamahendran, T. Yoshiki and C. Y. Lee
Department of Animal Science, University of British Columbia, Vancouver, Canada.

The overall objective of this series of experiments is to generate immunological markers that may elucidate bull sperm surface changes in vitro. Here we report the initial experiments of the study, involving the production and characterization of monoclonal antibodies (mAbs) again bull sperm. BALB/c mice were immunized with phosphate-buffered saline (PBS)-washed whole bull sperm, and their spleen cells were fused with NS-1 myeloma cells in two separate cell fusion experiments, resulting in the generation of 15 mAbs. The mAbs were specific to antigens of either the posterior tail or the head regions of bull sperm and detected five major domains of antigen localization in the bull sperm (apical crescent, equatorial band, principal acrosomal, whole head, and posterior tail). Eleven of the 13 head-specific mAbs recognized intra-acrosomal antigens, whereas 2 mAbs recognized antigens that were localized in the plasma membrane. One mAb specific to the tail region was of the IgM class; the remaining 14 mAbs were of the IgG class. They were all sperm specific, with no cross-reactivity to bovine oocytes or to any of the 12 bovine somatic tissues tested. The mAbs were not species specific, however, because 11, 10, 2, and 1 of the 15 mAbs cross-reacted with sheep, pig, mouse, and human sperm, respectively. None of the mAbs cross-reacted with rooster sperm. The cognate antigens of the 11 tested mAbs were of testicular origin, but several of them showed enhanced binding to epididymal sperm. In western blot analysis, 3 of the 13 mAbs tested identified more than one protein band (40-200 kDa). Seven others recognized proteins of > or = 200 kDa, whereas three mAbs recognized no proteins.

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