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AN IMMUNOMAGNETIC METHOD TO SEPARATE  
X AND Y CHROMOSOME-BEARING  
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The purpose of this project was to develop a rapid and inexpensive method to separate mammalian spermatozoa in X and Y chromosome-rich fractions.

The H-Y antigen is a phylogenetically conserved male-specific protein found ubiquitously on male cells. An immunomagnetic method to sort spermatozoa was developed by exploiting the fact that the H-Y antigen is present on the surface of Ybearing sperm but absent on the surface of their Xbearing counterparts. Washed bovine sperm cells were treated with monoclonal antibodies to the H-Y antigen (MoAb 12/49 to immunoglobulin G). Supermagnetized polymer beads (Dynabeads-M450, Dynal, inc) coated with an anti-antibody to the MoAb 12/49 were then added to the cells. Microscopic evaluation revealed that approximately 50% of the sperm cells from each of seven bulls sampled were attached to one or more beads. Using a magnet (MPC-1, Dynal Inc.), spermatozoa bound to magnetic beads were removed from the sample. Flow cytometric evaluation using a fluorescein-conjugated anti-antibody to MoAb 12/49 revealed that immunomagnetically sorted sperm samples were greater than 99% pure for X-bearing cells. Immunomagnetic sorting provides a rapid, inexpensive method to produce nearly pure populations of X-bearing spermatozoa.