

Acrosome components after intracytoplasmic sperm injection: the decondensation frontier

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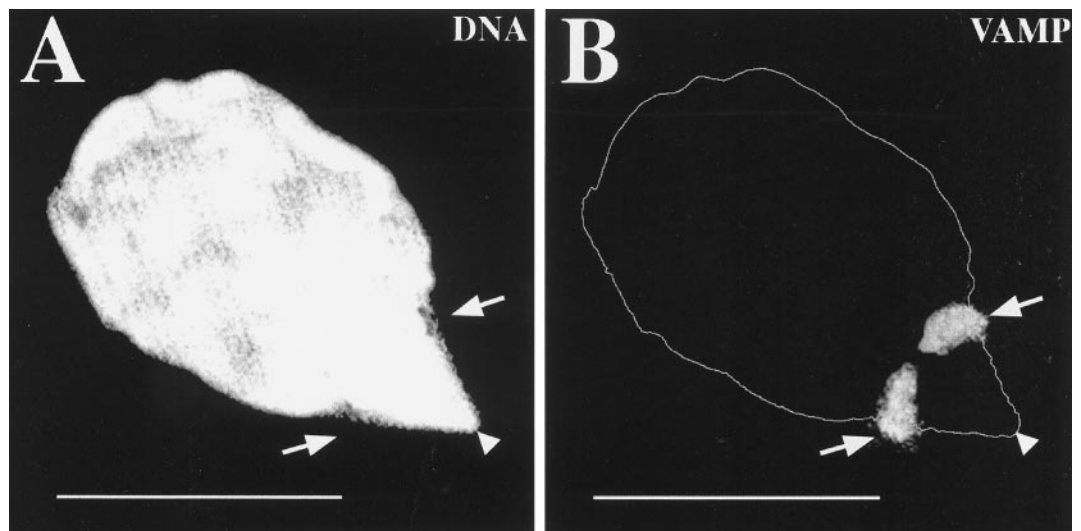
Intracytoplasmic sperm injection (ICSI) allows the direct injection of a spermatozoon into an oocyte and has evolved as an assisted reproduction technique to overcome certain types of male factor infertility (1). ICSI bypasses many sperm-oocyte interactions that take place during in vivo and in vitro fertilization, thus introducing into the oocyte sperm-specific structures normally removed before the male DNA

enters the ooplasm. Prominent among these is the acrosome, a secretory vesicle that covers most of the mammalian sperm nucleus (2). Exocytosis of acrosomal components is thought to aid the sperm in gaining access to the oocyte plasma membrane.

Using the rhesus monkey as a model for human ICSI (3, 4) and antibodies to vesicle-associated membrane protein (VAMP), an ac-

FIGURE 1

Confocal imaging of a rhesus sperm nucleus 8 hours after injection into a mature metaphase II arrested rhesus oocyte. Both DNA (A) and the corresponding VAMP image (B) are shown. To better localize VAMP on the male pronucleus, a tracing of the DNA staining is also presented in B. Decondensation of the apical portion of the sperm head (*arrowhead*) seems to be prevented by a "collar" of acrosomal VAMP (*arrows*). Bar = 10 μ m.



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rosome marker (2), it can be shown that part of the acrosome (possibly the equatorial segment) remains attached to the sperm head 8 hours after ICSI (Fig. 1). This VAMP “collar” (arrows) seems to sharply separate the already decondensing (posterior) portion of the sperm head from the apical part (arrowhead), which remains largely condensed. Although VAMP is eventually removed from the male pronucleus in most cases observed (4), its persistence following ICSI results in asynchronous sperm decondensation that may lead to delays in the completion of the first embryonic cell cycle.

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