

Journal of Andrology, Vol 19, Issue 2 207-214, Copyright © 1998 by The American Society of Andrology

## JOURNAL ARTICLE

# The effects of antifreeze peptide III (AFP) and insulin transferrin selenium (ITS) on cryopreservation of chimpanzee (*Pan troglodytes*) spermatozoa

A. I. Younis, B. Rooks, S. Khan and K. G. Gould

Division of Molecular Medicine, Yerkes Regional Primate Research Center, Emory University, Atlanta, Georgia 30329, USA.

We investigated the effects of antifreeze peptides (AFP) and insulin transferrin selenium (ITS) on the motility and membrane integrity of chimpanzee (*Pan troglodytes*) spermatozoa after chilling (0-5 degrees C) and thawing. The effects of three thawing procedures, in the presence or absence of AFP and ITS, on sperm motility and on the status of the plasma membrane and acrosome were also examined. During chilling, AFP and ITS seem mildly cytotoxic, as the progressive motility and velocity (curvilinear and straight line) declined significantly at AFP concentrations of 1, 10, and 100 microg/ml and at ITS concentrations of 1 and 10 microg/ml. However, at a concentration of 100 microg/ml, ITS was able to protect sperm during short-term hypothermic storage. Addition of AFP or ITS at 100 microg/ml to test egg yolk-glycerol extender during freezing significantly ( $P < 0.05$ ) increased postthaw motility, plasma membrane integrity, and acrosome integrity. The mean ( $\pm$ SE) motility recovery rate increased from 28.9  $\pm$  3.9%, for the untreated control, to 59.2  $\pm$  5.8% and 67.8  $\pm$  7.4%, for ITS and AFP, respectively. The effects of the thawing procedure were influenced by the presence of AFP during the freezing cycle. An improved motility recovery rate of 67  $\pm$  4.2% was obtained when chimpanzee sperm frozen in test egg yolk-glycerol extender supplemented with AFP were thawed rapidly at 37 degrees C, compared to 47  $\pm$  5.2% and 44  $\pm$  8.2% for slow (23 degrees C) and ultrarapid (75 degrees C) thawing, respectively. The motility recovery after thawing of ITS-treated semen at 23 degrees C, 37 degrees C, or 75 degrees C was not significantly different. Semen frozen without AFP or ITS and thawed at 75 degrees C was seriously ( $P < 0.05$ ) damaged. This study provides evidence that AFP- or ITS-supplemented semen extender improves postthaw sperm motility in the chimpanzee.

This article has been cited by other articles:



### This Article

- [Full Text \(PDF\)](#)
- [Alert me when this article is cited](#)
- [Alert me if a correction is posted](#)

### Services

- [Similar articles in this journal](#)
- [Similar articles in PubMed](#)
- [Alert me to new issues of the journal](#)
- [Download to citation manager](#)

### Citing Articles

- [Citing Articles via HighWire](#)
- [Citing Articles via Google Scholar](#)

### Google Scholar

- [Articles by Younis, A. I.](#)
- [Articles by Gould, K. G.](#)
- [Search for Related Content](#)

### PubMed

- [PubMed Citation](#)
- [Articles by Younis, A. I.](#)
- [Articles by Gould, K. G.](#)



Journal of ANDROLOGY

[▶ HOME](#)

Y. Agca, J. Liu, S. Mullen, J. Johnson-Ward, K. Gould, A. Chan, and J. Critser

Chimpanzee (*Pan troglodytes*) Spermatozoa Osmotic Tolerance and Cryoprotectant Permeability Characteristics

J Androl, July 1, 2005; 26(4): 470 - 477.

[\[Abstract\]](#) [\[Full Text\]](#) [\[PDF\]](#)



Journal of ANDROLOGY

[▶ HOME](#)

Y.-H. Li, K.-J. Cai, A. Kovacs, and W.-Z. Ji

Effects of Various Extenders and Permeating Cryoprotectants on Cryopreservation of Cynomolgus Monkey (*Macaca fascicularis*) Spermatozoa

J Androl, May 1, 2005; 26(3): 387 - 395.

[\[Abstract\]](#) [\[Full Text\]](#) [\[PDF\]](#)



Journal of ANDROLOGY

[▶ HOME](#)

A. J. Soler, A. J. Garcia, M. R. Fernandez-Santos, M. C. Estes, and J. J. Garde

Effects of Thawing Procedure on Postthawed In Vitro Viability and In Vivo Fertility of Red Deer Epididymal Spermatozoa Cryopreserved at -196{degrees}C

J Androl, September 1, 2003; 24(5): 746 - 756.

[\[Abstract\]](#) [\[Full Text\]](#) [\[PDF\]](#)



EUROPEAN JOURNAL OF CARDIO-THORACIC SURGERY

[▶ HOME](#)

G. Amir, B. Rubinsky, Y. Kassif, L. Horowitz, A. K. Smolinsky, and J. Lavee  
Preservation of myocyte structure and mitochondrial integrity in subzero cryopreservation of mammalian hearts for transplantation using antifreeze proteins--an electron microscopy study

Eur. J. Cardiothorac. Surg., August 1, 2003; 24(2): 292 - 297.

[\[Abstract\]](#) [\[Full Text\]](#) [\[PDF\]](#)