

Evaluation of Rat Sperm Motility by CASA

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Abstract

Introduction: When mammalian spermatozoa first enter the epididymis from testis they display little or no progressive motility. On transit along the epididymis, spermatozoa gradually acquire the potential for full progressive motility. This process which begins after sperm leave the testis, is called sperm maturation and requires specific factors from the epididymal epithelium. The *aim* of this study was to investigate the use of computer-assisted sperm analysis for the objective determination of rat sperm motility. Having validated this system, it would be used to assess *in vitro* and *in vivo* sperm maturation.

Material and methods: Sperm samples from various regions of the epididymis and ejaculates, were prepared. Primary cultures of the epithelium from the rat epididymis were established. A novel computer-aided sperm analysis was used to analyze and characterize the motility of the rat spermatozoa during *in vitro* and *in vivo* maturation. Sperm motility analysis also examined during co-culture. Image analyses of sperm movement from video recording tapes were also examined.

Results: This study used a novel CASA system and image analysis to monitor the changes in motility as spermatozoa undergo maturation in the rat epididymis, during ejaculation and during co-incubation with epididymal epithelial cultures and medium preparations. It is interesting to note that changes in epididymal sperm motility were occurred *in vivo* and *in vitro*. The co-incubation of immature rat spermatozoa from the caput epididymis with epithelial cultures led to significant changes in progressive sperm motility parameters associated with maturation.

Conclusion: This study indicate the CASA and other image analysis techniques, were able to characterize in detail the objective determination and changes in motility parameters of rat spermatozoa. Validation of this system provides the best facility to assess rat sperm maturation *in vitro*.

Key words: rat spermatozoa, CASA system, image analyzer, epididymal sperm maturation, *in vitro* sperm maturation.

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