

Microtubule configuration and its relationship to sperm morphology in mammalian spermiogenesis

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The acrosome is a secretory vesicle located in the mammalian sperm head. Its main function is to transport hydrolytic enzymes. These enzymes will dissolve the zona pellucid, assisting the sperm in fertilizing the egg. The acrosome is assembled in the haploid spermatid during spermiogenesis, but many of its enzymes are already synthesized in pachytene spermatocytes during the early phase of spermatogenesis. Haploid spermatids have developed unique mechanism(s) to assure the proper localization/orientation of the acrosome, attachment near the nucleus, and the targeting of acrosomal proteins towards this vesicle. During spermiogenesis, these germ cells undergo dramatic transformations in shape and intracellular distribution of organelles, and the configuration of microtubules seems to be involved with each specific step. In this context, it seems microtubules are essential, for the assembly and formation of the acrosome during spermiogenesis. Microtubules are also involved in guiding prot