

## **Cellular Distribution and Organization of Centrosomal Components, *NuMA* and *Nek2* during Mouse Spermatogenesis and Fertilization**

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*NuMA* is a nuclear mitotic apparatus protein that involves in the formation of the spindle. Also, *Nek2* is a mammalian cell cycle-regulated serine/threonine kinase that involves in G2/M progression, chromosome condensation and centrosome regulation. These proteins maybe play a role in organizing centrosome of embryo. So far, it has been known that each distal, proximal centriole of sperm degenerates during testicular stage of spermiogenesis & epididymal stage. Thus, it seems that the sperm does not contribute the centrosome during murine fertilization. Whereas it has been well known that centrosomes are not present in the mouse oocyte, and that they appear during morula or blastocyst stage. However, the cellular distribution and organization of the centrosomal components in the oocyte is completely unknown during fertilization and embryonic development. We examined distribution of two well-known centrosomal proteins, *NuMA* and *Nek2* in gametes and embryos of mouse to get an insight in the reorganization of centrosomal proteins during germ cell development and early fertilization. Spermatogenic cells, spermatozoa, oocytes and embryos were analysed with anti-*NuMA* or anti-*Nek2* antibodies by immunocytochemistry. Mitotically or meiotically active spermatogenic cells, spermatogonia or spermatocytes were intensively stained with anti-*NuMA* or anti-*Nek2* antibodies in both centrosomes and cytoplasm of spermatogenic cells, whereas the oocytes showed different staining patterns depending on the meiotic stages. During maturation, both GV and metaphase I oocyte were stained intensively with *NuMA* antibody in the nucleus but not metaphase II stage. *Nek2* was only detectable in chromosome at metaphase II. In early developmental embryo, *NuMA* was detected in nucleus of each embryo, *Nek2* was not possible to detect due to either low abundance or cell cycle-specific presence. *Nek2* proteins seem to be disappeared during spermatogenesis. In contrast to previously reported results, *NuMA* antigens were detected in both decondensing head, and the centriole of demembranated and decondensed sperm heads. This finding suggests that both the spermatozoa and oocyte may contribute necessary components of centrosomal proteins during fertilization process and subsequent development.