

Thesis Abstract

Analysis of the nucleolar cycle in the seminiferous epithelium of rodents

R.L. Peruquetti

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Orienting Professor: Dr. Maria Tercília Vilela de Azeredo-Oliveira

The nucleolus is a subcompartment of the nucleus and the site of ribosome biogenesis. During the mitotic and meiotic cell cycles, a disorganization and later reorganization of the nucleolar material occur, an event called nucleologenesis. In the spermatogenesis of mammals and other vertebrates, there is evidence of the disorganization of the nucleolus at the end of meiosis I, which supplies material for the cytoplasmic formation of an organelle called the "chromatoid body" (CB). The CB is a structure characteristic of spermatogenic cells and seems to be responsible for RNA metabolism in these cells and for some events of spermiogenesis, such as the formation of the acrosome, cellular communication between spermatids, and the formation of the spermatozoon middle piece and tail. The aim of this paper was to obtain information about the cytochemical and ultrastructural nature of the nucleolar cycle and the distribution of cytoplasmic RNAs in the seminiferous tubule cells of *Rattus norvegicus*, *Mus musculus* and *Meriones unguiculatus*. The testis was fixed in Bouin and Karnovsky solutions for conventional histological analysis and for cytochemical study that included: periodic acid-Schiff, hematoxylin-eosin, Feulgen reaction, silver-ion impregnation, Gomori's reticulin stain, toluidine blue, modified method of critical electrolyte concentration, and basic and acid fast green. The blocks of testis fixed in glutaraldehyde were used for ultrastructural analysis by transmission electron microscopy. Ultrathin sections were double-stained with uranyl acetate and lead citrate. All the techniques used provided information on the origin and function of the CB in the spermatogenic cells. Therefore, considering the persistence of the RNA and nucleolar ribonucleoproteins during spermatogenesis of *Rattus norvegicus*, *Mus musculus* and *Meriones unguiculatus*, our findings corroborate the statement that these molecular complexes are very important in the spermiogenesis phases. It can be suggested that these ribonucleoprotein corpuscles ("chromatoid bodies") are of nuclear origin and have a role in the successive series of events that occur in the formation of the spermatozoon. Furthermore, these results reinforce the conservation of the mechanisms involved in preserving necessary levels of protein stocks in different stages of cell differentiation, from spermatid to spermatozoon, in these rodent species.