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# Cellular Localization of GABA and GABA<sub>B</sub> Receptor Subunit Proteins During Spermiogenesis in Rat Testis

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The GABAergic system, a major inhibitory regulator in the central nervous system, may also play important roles in peripheral nonneuronal tissues and cells. Recent studies showed that GABA<sub>B</sub> receptor is expressed in testis and sperm. To understand the role of the GABAergic system in spermiogenesis, we examined cellular localization of GABA and GABA<sub>B</sub> receptor subunits in rat spermatids by immunocytochemistry. Immunoreactivity for GABA was detected around acrosomal granules of spermatids during the Golgi and cap phases. GABA<sub>B(1)</sub> immunoreactivity was observed in the acrosomal vesicle of spermatids in Golgi phase, and during cap phase, this reactivity expanded to the entire region of the acrosome covering the nuclear membrane. The level of reactivity decreased gradually with maturation of spermatids. In contrast, GABA<sub>B(2)</sub> immunoreactivity was not observed in spermatids during Golgi phase but was detected in the equatorial region during cap phase. Both GABA immunoreactivity and GABA<sub>B(2)</sub> immunoreactivity were transferred to the residual cytoplasm during the release of spermatozoa. Electron microscopic immunocytochemistry revealed that, during cap phase, GABA and GABA<sub>B(1)</sub> were distributed within the whole acrosomal vesicle but not in the acrosomal granule. GABA<sub>B(2)</sub> immunoreactivity was observed in the narrow space between the inner acrosomal and nuclear membrane and was limited to the equatorial region of the spermatid head. These results indicate that the GABAergic system might be involved in regulation of spermiogenesis.

Key words: Spermatid, immunocytochemistry, acrosome, GABAergic system

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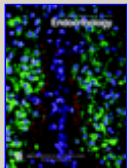
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