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JOURNAL ARTICLE

Distribution of mouse sulfated glycoprotein-1 (prosaposin) in the testis and other tissues

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Mouse sulfated glycoprotein-1 (SGP-1) is the homologue of rat SGP-1 and human prosaposin. Rat SGP-1 is one of the major secretory products of rat Sertoli cells in culture. Human prosaposin is the precursor of four lysosomal saposins, termed A, B, C, and D, that are generated by limited proteolysis. Saposins are sphingolipid-binding proteins that function as activators for lysosomal enzymes involved in sphingolipid hydrolysis of the former. Recently, we have generated a cDNA encoding the mouse SGP-1 by polymerase chain reaction amplification of a mouse testicular Uni-Zap XR cDNA library with two synthetic oligonucleotide primers and have used it as a probe for examining the tissue distribution of SGP-1 mRNA. We have also studied the distribution of the translation product of SGP-1 mRNA in the same tissues. The analysis demonstrated that SGP-1 is expressed ubiquitously in all tissues examined. This investigation showed that, in mouse testis, two forms of SGP-1 exist: a 70-kDa secreted protein and a 65-kDa protein corresponding to the lysosomal form of SGP-1, which may be involved in the generation of saposins. Light microscope immunocytochemistry with anti-SGP-1 antibody demonstrated that, in the mouse seminiferous tubules, the translation product of SGP-1 mRNA is expressed in Sertoli cells but not in germinal cells. Electron microscope immunogold labeling with anti-SGP-1 antibody yielded a strong reaction on lysosomes and phagolysosomes containing residual bodies but not on endosomes or luminal residual bodies. These results demonstrate that SGP-1 is not internalized from the lumen but is targeted directly to the lysosomes from the Golgi apparatus. Immunoblotting also confirmed the existence of a secreted form of testicular SGP-1 delivered to the lumen of the seminiferous tubules. The production of a secreted and a lysosomal form of SGP-1 by Sertoli cells indicates that this protein plays a multifunctional role. This study also suggests that the lysosomal form of SGP-1 may be involved in the degradation of membrane glycolipids from residual bodies phagocytosed by Sertoli cells.

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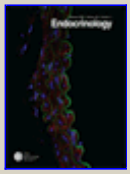

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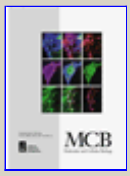

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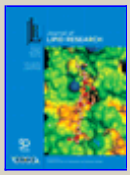

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