SUBCELLULAR LOCALIZATION OF PROLYL ENDOPEPTIDASE DURING THE FIRST WAVE OF RAT SPERMATOGENESIS AND IN RAT AND HUMAN SPERM

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Prolyl Endopeptidase (PREP) is an enzyme which cleaves several peptide hormones and neuropeptides on the carboxyl side of proline residues and is involved in many biological processes, including cell proliferation and differentiation, glucose metabolism, learning, memory, and cognitive disorders. PREP has also been identified as a binding partner of tubulin, suggesting the involvement of endopeptidase in microtubule-associate processes, independent of its peptidase activity. Furthermore, several reports have implied PREP participation in both male and female reproduction-associated mechanism. We assessed a potential involvement of PREP in the morphogenesis of rat testis, profiling its localization versus tubulin, during the first wave of spermatogenesis and in the adult gonad (from 7 to 60 dpp). We showed that, in mitotic phases, PREP shares its localization with tubulin in SC, gonocytes, and spermatogonia. Later, during meiosis, both proteins are found in spermatocytes, and in the cytoplasm of SC protrusions, surrounding the germ cells, while, during spermiogenesis, they both localize in the cytoplasm of round and elongating SPT. We also found that this enzyme has a peculiar nuclear localization, in the proliferating cells in all phases of analysis. Finally, they are expressed in the flagellum of mature gametes, as corroborated by additional immunolocalization analysis on both rat and human sperm. Our data support the hypothesis of the fundamental role of PREP in reproduction and in cytoskeletal organization during mammalian testis morphogenesis and gamete progression.