



Role of lysosomal acid phosphatase in the testis of bat, *Cynopterus sphinx* during the reproductive cycle.

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I|Abstract

Acid phosphatase is also called histochemical marker or indicator for ascertaining the site and pattern of distribution of lysosome in the eukaryotic cells (De duve, 1963) and has a function similar to that of alkaline phosphatase. Although it has a limited activity, it is no doubt significantly seen in pathological disorders. The acid phosphatase particles are located in the lysosomes of mammalian liver.

The intracellular localization of acid phosphatase in the testes of bat, *Cynopterus sphinx* reveal that it is synthesized in rough endoplasmic reticulum, concentrated, packaged, and transported to lysosomes (mono-enzyme specific and multi-enzyme specific population respectively). Before reaching lysosomes the enzyme may be budded off as secretory vesicles according to the requirement and along with lysosomes perform remodelling at the time of transformation of spermatogonia to the potential healthy spermatozoa. Lack of such a function of several enzymes (one is Acpase) during spermatogenesis and androgenesis in this bat may lead to sterility and decline in population (D. R. Saxena, 2012-2023). Chiropterans are second largest placental mammals, currently inhabiting various ecological niches on a global scale (Corbett and Hill 1980). Other functions of acid phosphatase are (i) hydrolysis of reserve of nutritional value for the growth and differentiation of spermatogenic cell (ii) secretory activity in Leydig cell (iii) nucleic acid synthesis and protein synthesis thus generating characteristic milieu interior in the seminiferous tubules (iv) affecting the formation and composition of testicular fluid acid phosphatase in the Sertoli cells may be important in producing metabolites of importance to developing stage of spermatogonia during spermatogenesis (v) to facilitate transfer of material between various cells associated and (vi) the presence of acid phosphatase in the head of spermatozoa help in removing the cell membrane barrier during the initial steps of fertilization.

According to D.R.Saxena (2008-2023) the weak activity of hydrolytic enzymes Acpase, Alkpase, beta glucuronidase, non specific and specific esterases, etc, in the endoplasmic reticulum and moderate activity in enzyme packaging and compacting (affecting spatial folding of polypeptide moieties under the influences of hormonal - genetic - chronobiology and altered environment) in the golgi complex subcellular organelle and intense activity in the lysosome particles during preparatory to active breeding physiological phases of animals, but maintenance of poor to weak activity during quiescent phase may be concerned with specific cells, tissues, organs, and organ systems. The initiation, synthesis, secretion, of several molecules in the interconnected - integral RERGL (rough endoplasmic reticulum-golgi complex -lysosomes) and SERGCL (smooth endoplasmic reticulum-golgi complex-lysosomes) to create interior milieu for structuring fresh subsequent mitotic - meiotic cycles (somatic and germinal cells) may be necessary to proliferate healthy male and female gametes and disposal of residual spermatids - sperms, Sertoli embedded either maturing or degenerating sperm heads, luminal sperm