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Rat Testicular Phospholipase A_2 Activity:

pH Optima, Its Cellular and Subcellular Distribution in the Gonad, and Some Factors That May Modulate Its Activity

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A sensitive radiometric assay was developed for detecting phospholipase A_1 and A_2 (PLA_1 and A_2) activity. Four to five times more PLA_2 activity was observed in rat testes than PLA_1 activity. Two PLA_2 were observed in the testis, one with an acid (3.5) and one with an alkaline (7.5-8.0) pH optimum. The acid pH optimal PLA_2 was located in the interstitial and lysosomal fractions. The alkaline pH optimal PLA_2 was localized in the germinal elements of the seminiferous tubules and in the lysosomalenriched and membrane-enriched fractions. Triton X-100 inhibited PLA_2 at 10^{-2} M and inhibited PLA_1 at 10^{-3} M. At 10^{-2} M, triton X-100 activated PLA_1. EGTA inhibited PLA_2 activity, whereas Ca^{++} at 10^{-2} to 10^{-3} M restored this activity. Corticosterone had no effect on PLA_2 activity, but progesterone, dihydrotestosterone, and testosterone all stimulated the enzyme at lower concentrations (10^{-9}-10^{-7} M), with testosterone giving maximum stimulation at a lower dosage (ie, 10^{-9} M compared to 10^{-7} M for dihydrotestosterone). Both androgens inhibited PLA_2 activity at higher concentrations.

Key words: rat testicular phospholipase A_2 activity, pH optima, localization, control

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