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JOURNAL ARTICLE

Testosterone and spermatogenesis: evidence that androgens regulate cellular secretory mechanisms in stage VI-VIII seminiferous tubules from adult rats

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The aim of this study was to investigate the effect of testosterone manipulation on the quantitative synthesis and secretion of a number of specific proteins produced by seminiferous tubules (ST) isolated at stages VI-VIII of the spermatogenic cycle from adult rats. The proteins selected were derived from different cellular sources. ST were isolated from control rats, from rats treated 4 days earlier with ethane dimethane sulfonate (EDS) to induce complete testosterone withdrawal by the destruction of the Leydig cells, and from EDS-treated rats injected with testosterone esters (TE) in order to maintain quantitatively normal spermatogenesis. Two-dimensional sodium dodecyl sulfate polyacrylamide gel electrophoresis, combined with computerized image analysis, was used to analyze 35S-methionine-labeled intracellular and secreted proteins. Testosterone withdrawal did not affect to any significant degree the total synthesis of any of the proteins studied. Similarly, the secretion of the major known Sertoli cell proteins SGP-1 and SGP-2, together with a third putative Sertoli cell protein, all of which appeared to be secreted constitutively, was also not affected to any major degree by EDS treatment. In contrast, the secretion of another probable Sertoli cell protein, together with six proteins found to be secreted by germ cells and one protein that appeared to derive from more than one cellular source, was reduced dramatically by testosterone withdrawal, but was maintained by treatment with EDS+TE. All of the affected proteins appeared to be secreted in a regulated manner. Our results confirm that testosterone manipulation has little or no effect on either total protein synthesis by ST, or on the secretion of the major Sertoli cell secretory proteins, at stages VI-VIII of the spermatogenic cycle, but suggest strongly that testosterone regulation of ST protein secretion at these stages is mediated by an effect on the regulated secretory pathways. Our findings also demonstrate that the secretion, not only of Sertoli cell proteins, but also of those secreted by germ cells, is androgen-regulated.

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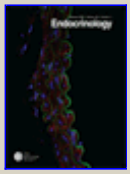

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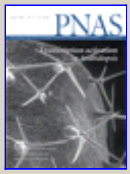

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