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Control of Rat Testicular Prostaglandin Dehydrogenase, Δ^{13} -Prostaglandin Reductase, and Total Prostaglandin Dehydrogenase Activities

Hypophysectomy, Follicle Stimulating Hormone, Luteinizing Hormone, Prolactin, Growth Hormone, and Testosterone

CHARLES C. OHUO-OBASIOLOU¹, MICHAEL D. GROESBECK¹, AND
LeGRAND C. ELLIS¹

¹ *Department of Biology, Utah State University, Logan, Utah*

The effects of hypophysectomy and various hormonal treatments on rat testicular prostaglandin dehydrogenase (PGDH), Δ^{13} -PG reductase, and total PGDH activities were studied *in vivo* and *in vitro*. All three activities were reduced, on a per animal basis, by hypophysectomy. Treatment with FSH increased all three activities while prolactin or GH plus LH inhibited only Δ^{13} -PG reductase activity, the inhibition being evident both *in vivo* and *in vitro*. Prolactin ameliorated the effects of FSH *in vivo* and the gonadotropin effects were considered to be allosteric in nature. The highest specific activity for total PGDH activity was found in the testicular capsule followed by the interstitial cells and the seminiferous tubules. The seminiferous tubules had more total activity than did the interstitial cells and testicular capsule. PGDH activities in the three structural compartments of the testis were considered physiologically related to the functions of these compartments, ie contractility or steroidogenesis. Changes in the specific activity of PGDH indicated that the enzymes in the seminiferous tubules were localized within nongerminal cells.

Key words: rat testicular prostaglandin dehydrogenase, hypophysectomy, luteinizing hormone, follicle stimulating hormone, prolactin, growth hormone, testosterone

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