

67. Induction of adrenocortical special zone in immature female possums (*Trichosurus vulpecula*) by gonadotrophin administration  
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The adult female possum is unique in that its adrenal cortex shows in addition to the cortex proper (c.p.) a hypertrophied area, the "special" zone (s.z.), while the adrenals of males and immature animals resemble that of eutherian mammals. Our previous work indicated that the s.z. possesses active  $5\alpha$  and  $5\beta$  reductases, not found in the c.p. The aim of the present study was to establish if the s.z. and its reductase activity could be linked with gonadal maturation. Six immature female joeys, 100-120 days old, were treated with gonadotrophins (FSH and LH) in varying amounts intermittently for 40 days. The treatment resulted in multiple follicle formation, a gross enlargement of uteri and vaginae and pouch development. Homogenized adrenals were incubated with  $^{14}\text{C}$  progesterone in the presence of an NADPH generating system and the identity of the conversion products confirmed by crystallizations. The yields of total  $5\beta$ -reduced pregnane derivatives increased from a control level of  $9 \pm 2\%$  to  $56 \pm 4\%$  (mean  $\pm$  S.E.M.), which was accompanied by a concomitant fall in the yields of cortisol and corticosterone, from  $62 \pm 2\%$  to  $22 \pm 6\%$  (mean  $\pm$  S.E.M.) respectively. Histological examination of adrenals revealed the presence of a s.z. of variable size. The data indicate a gonadotrophin and/or a sex hormone involvement in the adrenal s.z. formation and in the control of its reductase activity.

68. INTRACELLULAR PROGESTERONE REGULATES cAMP LEVEL AND REINITIATES MEIOSIS IN *XENOPUS* OOCYTES.  
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Microinjection of progesterone dissolved in paraffin oil induces the reinitiation of meiotic maturation in the *Xenopus* oocyte; 50% maturation is obtained when 50 nl of a  $5 \times 10^{-5}\text{M}$  solution is microinjected into the oocyte. An analysis of the leakage and the metabolism of the steroid shows that intracellular steroid is the true trigger. Furthermore progesterone microinjected in oil decreases the cAMP content as does externally applied hormone.

69. SIMILARITIES BETWEEN THE EFFECTS OF GLUCOCORTICOIDS AND CHEMICAL INDUCERS OF DIFFERENTIATION ON IMMATURE LYMPHOID CELLS  
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Events associated with the cytotoxic action of glucocorticoids on immature lymphoid cells have been studied using the CEM human leukaemic lymphoblast cell line. Treatment of these cells with glucocorticoids resulted in the progressive inhibition of uridine and thymidine incorporation and RNA polymerase A activity in a manner consistent with their arrest in the  $G_1$  phase of the cell cycle. These effects were followed by the inhibition of RNA polymerase B activity and extensive fragmentation of DNA by endonucleolytic attack. Identical lethal effects were produced by butyrate and other compounds which, like the glucocorticoids, induce growth inhibition and differentiation-related events in other cell types. From these results we propose the hypothesis that the lethal action and certain of the differentiating actions of the glucocorticoids are mediated directly or indirectly by effects on the methylation status of DNA.