(Gurdon & Woodland, 1968), so one must consider the possibility that a similar situation exists in the uterus. If so, one can ask if the cytoplasmic binding serves a function in addition to that of hormone transportation. Also, although oestradiol-17 β binding is related to biological action, is the converse true that, in order to get oestrogen action, one must have tight binding as in the uterus? No convincing evidence exists for this, but one observation raises the possibility that it might be so. The carcinogenic effect of oestrogen on the hamster kidney is accompanied neither by measurable nuclear binding of the hormone nor its marked retention by the kidney.

These studies were carried out in collaboration with Dr L. Martin, Dr A. W. Steggle and Dr M. Vertes.

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Metabolism of Testosterone and Activity of Metabolites in Prostate Organ Culture

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Organ cultures of prostates of normal young adult rats (Lasnitzki, 1965) were incubated with [³H]-testosterone. After a 24 hr. incubation, radioactivity was somewhat concentrated in the tissue. At least two-thirds of the testosterone was metabolized and among the identified metabolites of the medium and of the tissue the main compound was 17 β -hydroxy-5 α -androstane-3-one (androstanolone), especially in the nuclear fraction of the homogenate. There were also androstane-3 β ,17 β -diol and -3 α ,17 β -diols (the former predominantly), and some of the corresponding 17-oxo steroids, but neither 5 β -derivatives nor oestrogens were observed. Unknown non-polar compounds (under study) were also found.

Testosterone and the main metabolites were

tested for their activity at various concentrations in 6-day experiments (two or three changes of medium containing 3.5-70 μ M). Testosterone maintained the epithelium cell height and secretory activity and kept the stroma at minimum. Androstanolone was somewhat more active than testosterone but provoked essentially a hyperplasia (heaping of cells between the basement membrane and the intact superficial secretory cells), which was seen only with very high doses of testosterone. The 5 α -androstane-3 α ,17 β -diol was not very potent, but the 3 β ,17 β -diol was very active, and in a different manner: there was no hyperplasia at all, but a single layer of tall epithelial cells, with considerable secretory activity and much repression of stroma. The corresponding 17-oxo steroids showed a relatively small activity, and the 5 β -metabolites were inactive.

These results suggest that testosterone action may be related to its metabolism in the prostate through the formation of metabolites of different activity.

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The Hormonal Control of Protein Synthesis

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Most hormones can influence protein synthesis in their target organs, but the mechanism by which they do so is not yet understood. At the present time several hypotheses are tenable once it is accepted that not all hormones act in the same way even to produce the same effect and that any one hormone might act by different mechanisms on different aspects of metabolism.

There is an impressive body of evidence implicating 3',5'-cyclic AMP involvement in the response of many metabolic events to hormones (Sutherland, Øye & Butcher, 1965). In a few instances, for example the action of adrenocorticotrophic hormone on the adrenal gland, indirect evidence suggests that cyclic AMP might promote protein synthesis. In most other cases, for example insulin and growth hormone, the evidence suggests that cyclic AMP is not involved in the protein anabolic action of the hormones, although it is involved in the hormonally induced changes in, for example, lipid metabolism (Goodman, 1968).

Some hormones stimulate the synthesis of proteins not previously synthesized by the organism: the most clear-cut examples occur during development. It is possible that, in these cases, de-repression of a portion of the genome has occurred so that new messenger RNA types are synthesized (Karlson, 1963). It seems unlikely, in