Purvis, J. L., Battu, R. G. & Péron, F. G. (1968). In *Functions of the Adrenal Cortex*, p. 1007. Ed. by McKerns, K. W. Amsterdam: North Holland Publishing Co.
Simpson, E. R. & Estabrook, R. W. (1969). *Arch. Biochem. Biophys.* **129**, 384.

Changes in Mitochondrial Structure and Ribosomal Activity in Muscle as a Consequence of the Interaction between a Glucocorticoid and some Anabolic Steroids

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When adult male rats were treated with a single dose of triamcinolone acetonide (20 mg./kg.) changes in the mitochondria of the thigh muscles were seen under the electron microscope that became most marked about 12 hr. after injection of the drug. Myelin figures and whorls were apparent when the muscle was fixed in 5% (v/v) glutaraldehyde and post-fixed in 1% (w/v) OsO_4 , but this type of damage was not seen when the fixation media were made 2 mM with respect to Ca^{2+} , nor when the muscle was stretch-fixed directly in OsO_4 for 2 hr. Extremely large mitochondria were seen independently of the fixation method in some fibres, whereas in others the mitochondria disappeared completely. The mitochondria were not swollen. Some morphological changes were seen as early as 2 hr. after triamcinolone administration. Throughout the 24 hr. period the rest of the tissue remained unaltered.

When the animals were pretreated with testosterone (5 mg./kg.) daily for 3 days and then given triamcinolone acetonide (20 mg./kg.), enlarged mitochondria were seen after 12 hr. in even greater numbers than in animals receiving triamcinolone acetonide alone, and muscle glycogen rose to 3.7 times the control value compared with 2.8 times the control value when only the anti-inflammatory steroid was given. The activity of muscle ribosomes from the same animals was decreased after 12 hr. to the same extent as with triamcinolone alone, i.e. to about 75% of control value. Pretreatment with the anabolic steroid Ba-36644 had no effect on the enlarged mitochondria, but the activity of muscle ribosomes was partially restored to normal. In contrast, pretreatment with methandienone (Dianabol) (5 mg./kg.) enabled normal ribosomal function to be retained, together with normal mitochondrial morphology, after the animals had received triamcinolone acetonide. Again, however, there was no effect on the glucocorticoid-induced rise in muscle glycogen.

Since methandienone would have less androgenic action than testosterone (Desaules, Krahenbühl, Schuler & Bein, 1959) or Ba-36644 (Desaules &

Schär, 1967) at the dosages used, these results show that the ability of an anabolic steroid to counteract the effects of a glucocorticoid is probably not a function of its androgenicity. A similar conclusion from chronic studies in rabbits (Bullock, White & Worthington, 1968) is therefore substantiated.

Bullock, G., White, A. M. & Worthington, J. (1968). *Biochem. J.* **108**, 417.

Desaules, P. A., Krahenbühl, C., Schuler, W. & Bein, H. J. (1959). *Schweiz. med. Wschr.* **89**, 1313.

Desaules, P. A. & Schär, B. (1967). *Proc. 2nd int. Congr. Hormonal Steroids: Excerpta med. Found. int. Congr. Ser.* no. 132, p. 541.

Purification of an Oestrophilic Protein from Calf Uterus

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A method has been devised for purifying the oestrogen-binding protein ('uptake receptor') of uterine cytosol that circumvents the marked tendency of this receptor to aggregate during attempted isolation. Ammonium sulphate precipitation of the oestradiol-receptor complex of calf uterine cytosol in the presence of Ca^{2+} yields both an 8s complex and its 4s subunit, which are stable during further fractionation by gel filtration and ion-exchange chromatography. The major product is the 4s complex, which does not revert to the 8s form in the absence of salt and which has been purified 5000-fold to yield receptor protein of about 4% purity. The elution volumes from Sephadex G-200 indicate molecular weights of approx. 200 000 for the 8s complex and 75 000 for the 4s subunit; on isoelectric focusing these partially purified complexes show isoelectric points of 5.8 and 6.4 respectively. In sucrose gradients containing KCl, the purified 4s complex sediments at a lower rate than does the 5s oestradiol-receptor complex extracted from the nuclei of calf uterine horns exposed to dilute solutions of tritiated oestradiol at 37° *in vitro*.

Although the receptor protein is less stable when not complexed with oestradiol, rapid purification, by salt precipitation and ion-exchange chromatography, of calf uterine cytosol containing Ca^{2+} but no oestradiol furnished the uncomplexed 4s subunit. When exposed to oestradiol, this protein showed strong saturable binding, similar in all respects to that of the original cytosol fraction and inhibited both by hexoestrol and by nafoxidine. Thus the stable 4s subunit appears to be closely related to the oestrophilic portion of the 8s receptor protein.