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DISSOCIATED STIMULATION BY ACTH OF ADRENAL CORTICOSTERONE AND PROTEIN SYNTHESIS

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Thirty hrs after hypophysectomy of rats, stimulation of ^{14}C-gly incorporation by pig adrenal 15 000 x g SN upon addition of rat adrenal 105 000 x g SN was almost as high (plus 684 $\pm$ 28 cpm) as after three days of ACTH-treatment of normal rats (plus 803 $\pm$ 61 cpm, control rats plus 424 $\pm$ 87 cpm, $p < 0.001$). Amino acid incorporation could not then be further elevated by prior ACTH infusion or i.m. treatment of hypophysectomized rats (plus 619 $\pm$ 14 cpm). Thus, 30 hrs after hypophysectomy protein synthesis in adrenal homogenates still appears to occur at an increased level, presumably due to the stress of hypophysectomy, whereas corticosterone secretion rapidly decreased to baseline levels (20.3 $\pm$ 2.4 ng/4 min.) after hypophysectomy, and maximal stimulation by ACTH of corticosterone secretion into the adrenal vein appears to be reduced 30 hrs after hypophysectomy (895.0 $\pm$ 197.2 ng/4 min.) in comparison with values obtained with i.m. ACTH application or i.v. ACTH assay 1 to 4 hrs after hypophysectomy (1805.7 $\pm$ 201 ng/4 min.)

Eight and ten days after hypophysectomy, only one tenth of stimulation of corticosterone secretion was obtained by two i.m. injections of 5 U β^{1-24}corticotrophin (150.9 $\pm$ 7.4 ng/4 min., control 11.8 $\pm$ 6.2 ng/4 min.). However, 14 days after hypophysectomy and following 4 hrs of ACTH infusion or i.m. ACTH injection (as above) rat adrenal 105 000 x g SN exhibited roughly twice the stimulation of ^{14}C-gly incorporation by 15 000 x g SN of pig adrenals (plus 474 $\pm$ 25 cpm) as compared with the controls (plus 255 $\pm$ 14 cpm).

The results indicate that the stimulation by ACTH of the limiting factor rate for *in vitro* adrenal protein synthesis and the stimulation of *in vivo* corticosterone secretion can be dissociated and are hence presumably independent.

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