Increased sensitivity to epinephrine (epi) of lipolysis and of the adenylate cyclase-protein kinase (PK) system in diabetic rat adipose tissue (AT) and fat cells (FC)

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Epi - but not ACTH - stimulates glycerol release from diabetic rat AT half-maximally at 8fold lower concentrations than in normal AT. Lipolysis in diabetic FC is 3 times more sensitive to both epi and ACTH than normal FC. Epi - but not ACTH - causes half-maximal cAMP and PK responses in both diabetic AT and FC at 3fold lower concentrations than in normal AT and FC. In accordance with these findings is a 3fold increase in epi-sensitivity of the adenylate cyclase in FC-ghosts from diabetic AT. Basal cAMP-levels and PK-activities are not significantly different in AT of normal and diabetic rats if expressed per µg of protein. However, per g fresh weight, cAMP and PK activity are elevated in diabetic AT. Increased sensitivity to catecholamines of diabetic AT provides an additional explanation for elevated plasma-free fatty acids in the diabetic state. Furthermore, insulin seems to play a role in modifying the catecholamine response of AT.

Purification of phosphatase activity of human crythrocytes

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In order to find out any relationship between high-affinity Ca^{2+}-ATPase (EC 3.6.1.3) and Ca^{2+}-dependent p-nitrophenylphosphatase (EC 3.1.3.1) of human erythrocytes, we tried to isolate and characterize the phosphatase activity. - Human blood (group 0, Rh^+) was washed 3 times with isotone KCl-solution. The packed erythrocytes were diluted 1:1 with 10 mM $CaCl_2$ and 40 mM morpholinopropanesulfonic acid (MOPS), pH 7.5, and hemolyzed by freezing at -80 °C. After thawing, the hemolyzed erythrocytes were diluted 1:1 with 10 mM MOPS, pH 7.5, and the membranes were sedimented at $37{,}000 \times g$ for 40 min. Soluble phosphatase activity of the supernatant was purified on DEAE-sepharose CL-6B using a linear gradient of 20–250 mM KCl. After precipitation of the most active fractions with 80% $(NH_4)_2SO_4$, further purification was carried out on sephadex G-100 at 150 mM K^+, 2 mM Mg^{2+}, 0.2% mercaptoethanol and 20 mM MOPS, pH 6.8. The phosphatase activity could be purified 2100fold up to 11.6 U/mg protein. As shown by SDS-gel-electrophoresis, the mol.wt of the active material is $\leq$ 30,000 daltons.

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Dopamine currents in cell R15 of *Aplysia*

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Aplysia californica abdominal ganglia are isolated, bathed in culture medium and desheathed. Cell R15 is penetrated with 2 electrodes for voltage clamping. Dopamine and dopamine antagonists are perfused over the preparation. Hyperpolarizing currents elicited by step increases in dopamine concentration reach their final levels in 10–20 min. Complete washout requires 20–40 min. Dopamine currents can be elicited by concentrations as small as 10^{-6} M; saturating currents require concentrations in excess of 10^{-4} M. Hyperpolarizing synaptic currents elicited by stimulation of the branchial nerve are depressed by bath application of dopamine in proportion to the current elicited directly by dopamine. Both the dopamine current and the synaptic current are inhibited stereospecifically by LSD in concentrations of 10^{-6} M or less. The results suggest that dopamine is an agonist at postsynaptic receptors and possibly at nonsynaptic receptors that have characteristics similar to the synaptic receptors.

Serum-free hepatocyte culture: Evidence for de novo synthesis of multiple forms of cytochrome P450

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Chick embryo hepatocytes in primary monolayer culture maintain highly differentiated drug-metabolizing functions comparable to those of mammalian liver in vivo. Induction of at least 3 forms of P450 hemoproteins was observed when cells were exposed to appropriate inducer compounds. Induction was shown by a) analysis of CO-binding spectra, b) relative increases in activities of aminopyrine demethylase and arylhydrocarbon hydroxylase, c) increase in particular protein bands of mol.wt 49,000–57,000 daltons on SDS-polyacrylamide gel electrophoresis. De novo synthesis was confirmed by increased incorporation of ^{35}S-methionine into drug-induced protein bands relative to ^{3}H-methionine into controls. Addition of insulin (10^{-7} M) was required for induction. This chick embryo liver cell system provides a new tool for the study of the regulation of hepatic metabolism of drugs and carcinogens.

'Permissive' role of the beta-adrenergic system in drinking induced by circulating renin

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In uninephrectomized rats, constriction of the artery to the remaining kidney produced a 5fold increase in plasma renin level and a 50% decrease in renal renin concentration. This renin release stimulated water intake (28 ml/kg 6 h verus 9 ml for sham constriction). Pretreatment with 1 or 3 mg/kg 1-propranolol s.c. 30 min before constriction did not block renin release, but diminished the drinking response (20 and 10 ml/kg 6 h, respectively). We suggest that drinking induced by the increase in circulating renin levels (provoked by renin release following constriction) is in some way mediated by the beta-adrenergic system.