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RELATIOSHIP BETWEEN IODINE METABOLISM AND 32P-ORTHOPHOSPHATE INCORPORATION INTO PHOSPHOLIPIDS AND RNA IN THYROID OF NEONATAL RATS

J.Knopp, M.Palkovič and A.Fáberová, Institute of Experimental Endocrinology, Slovak Academy of Sciences, Bratislava, Czechoslovakia.

The in vivo iodine metabolism of 127, 131 and 125 I and 32 P incorporation in vitro into phospholipids and ribonucleic acids in thyroid of the postnatal and adult rats were studied. The specific activity of 125 and 131- I-iodide and thyroxine and triiodothyronine decreased after birth and was enhanced in adult rats. The stimulatory response of in vivo preinjected rats with thyrotropic hormone on thyroid hormone biosynthesis occured within all age groups but markedly in the second postnatal week. In vitro release of 131-I-thyroxine of the of the endogenous thyroglobuline was enhanced on the 16th day of life. Rat thyroid pieces took up of 32P-orthophosphate from the medium during 3 hours of incubation. We used Silica G gel thin layer chromatography in a solvent system petrolether:ether:acetic acid /82:16:1/ to separate other lipidic fraction from phospholipids. After 3 hr. of incubation decreased of 32 P labeled phospholipids after birth and increased in adult age whereas the incorporation of 32 P labeled RNA increased with age. The addition of 50 milliunit of thyrotropic hormone/ml of incubation medium enhanced the accumulation of 32P phospholipids during ontogenesis with maximum response after birth. These results indicate the posibility of maturation of the pituitary-thyroid system during postnatal period of life and increased phospholipid turnover after birth.

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EFFECT OF SOME AMINO-ACIDS ON CHICK LIVER LIPIDS

N.Ivanov, G.Dimitrov, V.Banskalieva. Institute of Animal Breeding, Sofia--Kostinbrod, Bulgaria

The presence of amino acids/aspartic and glutamic// in the incubation medium of St.aureus increases the incorporation of ^{14}C glycerol into the phospholipids and ^{14}C acetate in the fatty acids of the lipid fraction (Gale, Folkes). It has been established (Macfarlane) that under these conditions C_{15} and C_{17} acids having branched chains and C_{16}, C_{18} and C_{20} saturated acids predominate. We studied the effect of methionine, tryptophan, arginine, lysine, aspartic and glutamic acids on the level of lipids and fatty acids in the liver of growing chicks. Methionine and tryptophan increased the content of linoleic and arachidonic acids in the phospholipids. The addition of excess of lysine and argine increased the level of phospholipids in the liver and that of steeric and linoleic acid and decreased the level of palmitic and oleic acids. Glutamic acid increased the content of liver phospholipids and that of their unsaturated fatty acids while the aspartic acid decreased the content of phospholipids and that of their unsaturated fatty acids, at the same time increasing the level of the saturated acids. The essential amino acids used increased the quantity of liver phospholipids and their essential fatty acids. The increased content of linoleic and arachidonic acids is important for the normal development of chicks and represents starting material for the synthesis of prostaglandins.

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SYNTHESIS OF PROSTAGLANDINS IN HUMAN PLATELETS

S.Maffei and J. Clausen, Neurokemisk Inst. and Inst. f. Biologisk Kemi A-København Universitet, Denmark

The effect of prostaglandins-E (PGE) on the ADP induced agglutination of platelets (1) has prompted us to investigate the possibility of synthesis of PGE in human platelets.
We report preliminary findings that platelets incubated with ^{14}C acetate synthesise ^{14}C labaled PGE within 10 min.
Human platelets were isolated from citrated blood by slight modification of (2) using 1 ml plastic syringes for resuspending the platelets.
1 ml(≈ 10^9 platelets, pH 6.8) was incubated at 39°C with constant O_2 bubbling, 5 Ci of ^{14}C acetate in 500 l was added. The reaction was stopped by freesing at ÷60°C.
Pure samples of PGE_1, PGE_2 and PGE_3 donated by dr. K.C. Sriwastava, Neurokemisk Inst., were added as carriers. Lipids were extracted and PGE's first isolated by TLC I (3). The fraction from TLC I was rechromatographed on $AgNO_3$-TLC (4), along with PGE_1, PGE_2 and PGE_3 standards. The fraction were eluted and counted by Liquid Scintillation.
5% of the total lipid counts from TLC I were in the PGE's. Refractionation on TLC II showed 20-40% of this activity in PGE_1. The PGE_2 and PGE_3 fractions accounted for 0-5%.

1 - Kloeze J., Biochim.Biophys.Acta 187(1969) 285
2 - Deykin D. and Desser R.K., J.Clin.Invest. 47 (1968) 1590
3 -
4 - Hamberg M. and Samuelsson B., J.Biol.Chem. 241 (1966) 9257

This work was supported by a grant from the DANISH HEART ASSOCIATION.

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LIPID PEROXIDE APPEARANCE IN MICROSOMAL FRACTIONS

Capalna S.- Clinical Biochemistry, Faculty of Medicine, Sos.M.Bravul 42 Blok P.8 Bucharest-31 Romania.

Lipid peroxide and hydroperoxide may be formed naturally in tissues as a result of lipoxidase activity, exposure to light, ionizing radiations or in presence of metalic ions. The lipid peroxides which appear in the microsomal fraction of rat-liver was tested for, by, inhibition of glucose-6-phosphatase (F-6Pase) activity and oxygen uptake.

Working on microsomal fraction and rat-liver supernatants it was found that G-6Pase is inhibited proportionally with the amount of lipid peroxides appearing in the system. The lipid peroxide and hydroperoxide was found to be effeotive at 10^{-5}M in inhibiting the G-6Pase of 4 mg of microsomes. It seems likely that these effects of, lipid peroxide and hydroperoxide may be due to free radicals released by decomposition. The studies show that lipid peroxide differs greatly from hydrogen peroxide (H_2O_2) in its effects on cellular constituents.

Lipid peroxide and hydroperoxide cause inactivation of mitochondrial and microsomal enzymes, damage to the electron transport chain and release of hydrolases from lysosomes as a result of in vitro peroxidation.