Wed-S23-16

**FATTY ACIDS STIMULATE DIACYLGLYCEROL FORMATION IN PLATELETS & LYMPHOCYTES.**


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Unsaturated fatty acids added to platelets or lymphocytes prelabelled with \(^{14}C\) arachidonate induce radioactive diacylglycerol accumulation and increased loss of radioactivity from phosphatidylinositol (PI) proportional to fatty acid concentration. Prostaglandin (PG) production is inhibited by unsaturated fatty acids in platelets but is stimulated by these acids in lymphocytes. The mechanism for arachidonate release from PI initiating PG synthesis in platelets may involve a PI phosphodiesterase followed by a diacylglycerol lipase, which is inhibited by unsaturated fatty acids. Fatty acid stimulation of lymphocyte PG synthesis may occur via an alternative pathway.

Wed-S23-17

**PROSTACYCLIN PREVENTS ISCHEMIA-INDUCED INCREASE OF LACTATE AND c-AMP IN THE ISCHEMIC MYOCARDIUM.**

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The effect of PGI(2) (0.5 nmole/kg x min iv.) on myocardial metabolism was studied in cats subjected to 5 hrs of myocardial ischemia (MI) and compared to vehicle treated MI-cats. MI was followed by a 52% decrease in ATP and a concomitant increase in lactate (2-3-fold) and lactate/pyruvate-ratio in severe ischemic area.PGI, prevented this increase in lactate, but neither prevented the loss of energy-rich phosphates nor the increase in the lactate/pyruvate ratio. PGI abolished the ischemia-induced increase in c-AMP. It is concluded that PGI, exerts its beneficial actions - prevention of changes in the ST-segment and preservation of myocardial cell integrity - not by an improved local perfusion, but by its metabolic effects on c-AMP (c-AMP linked mechanisms) and lactate, protecting ischemic myocardium from irreversible damage. Supported in part by Deutsche Forschungsgemeinsch.

Wed-S23-18

**MYOCARDIAL PHOSPHOLIPIDS AND PROSTAGLANDIN (PG) RELEASE BY THE DIABETIC HEART.**

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The PG release (measured by bioassay) was increased in acutely (100 mg streptozotocin (SZ), 3 days) and in chronically (60 mg SZ, 30 days) diabetic rat hearts at least 2-3 fold if sufficient arachidonic acid (50 ug) was provided (prostacyclin (PGI): 297 and 348 vs 130 ng; PGE2: 36 and 31 vs 15 ng). Thus, an inhibition of the PG-synthetizing system can be excluded. The basal increased PI release (determined by RIA) agrees well with the accelerated coronary flow and the transiently diminished platelet aggregability, but was associated with a decrease in the arachidonic acid content of myocardial phospholipids. Thus, it might be concluded that a severe diabetic metabolic disorder lead to a compensatory release of PI with an increased coronary flow and an, thereby, improved oxygen availability to prevent the deleterious impairment of the myocardial energy supply in diabetes.

Wed-S23-19

**PROSTAGLANDIN SYNTHASE ACTIVITY IN TISSUES FROM GUINEA PIGS FED POLYUNSATURATED FATTY ACID (PUFA) SUPPLEMENTED DIETS.**

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Prostaglandin and thromboxane synthesis by the microsomal fraction isolated from brain, lung, kidney medulla, spleen, adipose tissue and seminal vesicles was determined following incubation with \(^{1-14}C\) AA. The ether extracts were analyzed on t.l.c., radioautographic location, solution and liquid scintillation counting. Tissues from control animals showed patterns of products characteristic for each tissue. Ad lib PUFA supplemented diet produced changes in the PUFA content of the tissues as follows lung>kidney medulla>adipose tissue> spleen, brain>seminal vesicles. The microsomal fractions showed increased synthesis of the product characteristic of each tissue. The PG content of blood serum (measured by radiimmunoassay) was significantly increased by PUFA supplementation.

Wed-S23-20

**GLASS CAPILLARY GAS CHROMATOGRAPHY ANALYSIS OF ARACHIDONIC ACID-OXYGENATED METABOLITES OF BLOOD PLATELETS USING FLAME IONIZATION DETECTION.**

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The stimulation of blood platelets by aggregating agents is accompanied by an activation of the phospholipases that hydrolyze arachidonic acid (C 20 :4) from the phospholipid pool. The C20:4 is further oxygenated by a cyclooxygenase and a lipooxygenase. We have developed a sensitive and resolutive quantitative method to investigate such a metabolism. We determined the quantitative profile of oxygenated metabolites including C20:4 itself. The practical sensitivity of the method was 2 ng per injected compound which allowed the use of small amounts of platelets. After the incubation of platelets with various pharmacological agents, it was possible to analyze the variations of the metabolism of C20:4 (i.e. hydrolysis and oxygenations).

Wed-S23-21

The influence of labelling time and medium-condition on 14C-Prostaglandins (PG) release from human diploid fibroblasts in culture.

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Confluent monolayers of fibroblasts were labelled with 14C-AA (arachidonic acid) in Dulbecco's MEM plus 10 % FCS. 3 modes of incubation were investigated. 1. 14C-AA was diluted in FCS and exposed for 24,48, 72 h. 2. 14C-AA was added 24,48, 72 h after feeding and stopped 24 h later. 3. 14C-AA was added at above times for increasing periods. The medium was analyzed for 6-oxo-PGF \(_2\alpha\), -PGE2, and AA. Cells were stimulated with bradykinin (BRS). The ether extracts were analyzed on TLC. A plateau of incorporation was reached within 12 h at 80 % and decreases slightly after 24 h. An increase in AA and PG's was observed with time, the same occurs after BRS. In modes 2 & 3 an increase in AA and a decrease in PG's occurs in the medium, whereas after BRS an increase in AA in both modes, but a decrease in PG's in the 2. and an increase in 3. can be seen.