retinol is probably by transesterification with endogenous lipids such as phospholipids, whereas the monoglycerides and lysophosphatides are esterified directly through acyl-CoA. In contrast with this general pattern of absorption of various lipids retinoic acid follows a completely different mechanism, in that it is rapidly absorbed through the portal route and is quickly excreted through the bile (Fidge *et al.*, 1968).

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Structure and Enzymic Properties of Phospholipase A from Porcine Pancreas

By G. H. DE HAAS (*Biochemistry Laboratory, State University, Utrecht, The Netherlands*)

Phospholipase A (EC 3.1.1.4) is an ubiquitously occurring enzyme that catalyses the hydrolysis of 1,2-diacyl-*sn*-glycerol-3-phosphatides into 1-mono-acyl-*sn*-glycerol-3-phosphatides (lysophosphatides) and free fatty acids. In mammalian pancreas this enzyme occurs as an inactive zymogen that, after its transport to the intestine, is converted by limited tryptic proteolysis into the active enzyme. The zymogen, as well as the active enzyme, was isolated from porcine pancreas. Both proteins are low-molecular-weight compounds (mol.wt. about 14 000), each consisting of one single polypeptide chain intramolecularly cross-linked by six disulphide bridges. The amino acid sequence and the positions of the disulphide bonds have been determined and the mechanism of the conversion of the precursor into the active enzyme has been elucidated.

By using a series of different synthetic phospholipids and intermediates, in which the polar head groups as well as the apolar acyl chains were modified, the minimal substrate requirements of the enzyme were determined. The enzyme has an absolute requirement for Ca^{2+} , and a mechanism based on kinetic analysis will be proposed. The kinetic parameters V_{max} and K_m were determined, and their dependence on pH and ionic strength will be discussed in relation to the amino acid side chains involved in binding and catalysis. The synthesis and kinetic behaviour of active-site-protecting competitive inhibitors will be reported, as well as their use in chemical modification studies of active-centre residues. The pronounced preference of the enzyme to attach only substrates that form organized lipid/

water interfaces will be demonstrated, and the implications involved in kinetic analysis will be discussed.

The Role of Clearing-Factor Lipase in the Removal of Triglyceride Fatty Acids from the Plasma

By D. S. ROBINSON (*Department of Biochemistry, University of Leeds, Leeds LS2 9LS, U.K.*)

Removal from the blood of the triglyceride fatty acids of chylomicrons and very-low-density lipoproteins occurs by virtue of the hydrolysis of the triglycerides in the capillary beds of the extrahepatic tissues by the enzyme clearing-factor lipase (lipoprotein lipase).

The extent to which the plasma triglyceride fatty acids are taken up by a particular tissue depends on the clearing-factor lipase activity of that tissue, relative to its activity in other tissues. Moreover, activity of the enzyme at a particular tissue site can change rapidly. Hence the enzyme has a directive role in the distribution of the plasma triglycerides. Evidence for this role is provided by the reciprocal changes in muscle and adipose-tissue clearing-factor lipase activity that occur with changes in nutritional state and that are associated with reciprocal changes in the extent of triglyceride fatty acid uptake by these tissues, and by the finding that the activity of clearing-factor lipase in the mammary gland is high only when uptake of triglyceride fatty acid occurs during lactation.

Alterations in the clearing-factor lipase activity of particular tissues may involve both changes in the amount of enzyme present and the conversion of one form of the enzyme into another. Evidence for the existence of more than one form of the enzyme in adipose tissue is available. There is, moreover, evidence to suggest that the changes in activity of the enzyme are under hormonal control and that such hormonal control is exerted, directly or indirectly, through changes in the tissue content of adenosine 3':5'-cyclic monophosphate.

Synthesis of Naturally Occurring Phosphonolipids

By ERICH BAER (*Banting and Best Department of Medical Research, University of Toronto, Toronto 5, Ont., Canada*)

The synthesis of phosphonic acid analogues of ester and ether phosphatidylethanolamines, phosphatidylserines and phosphatidylcholines (ester and ether kephalins and ester and ether lecithins) and