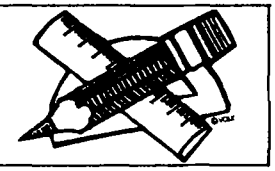
Abstracts



• Fats and Oils

HYDROGENATION OF THE COTTONSEED OIL ON ACTIVATED STATIONARY NICKEL CATALYST. A. Abdourakhimov et al. *Maslo-zhir. Promst.* 1978(11), 26-7. (Rev. Fr. Corps Gras)

PROCESS OF PURIFYING VEGETABLE OILS AND WAXES, PHOSPHATIDES, AND OTHER COMPONENTS WITH A HIGH MELTING POINT. *Maslo-zhir. Promst.* 1978(10), 42-3. (Rev. Fr. Corps Gras)

SEPARATION OF FATTY ACIDS FROM COTTONSEED OIL SOAPSTOCKS. A. Kh. Nabiev et al. *Maslo-zhir. Promst.* 1978(10), 27-8. (Rev. Fr. Corps Gras)

REFINING OF THE PALM OIL. A.A. Schmidt et al. *Maslo-zhir. Promst.* 1978(10), 18-21. (Rev. Fr. Corps Gras)

GLYCERIDIC COMPOSITION OF SUNFLOWER OILS WITH AN UNEQUAL CONTENT OF LINOLEIC AND OLEIC ACIDS. L.N. Khartchenko et al. *Maslo-zhir. Promst.* 1978(10), 13-14. (Rev. Fr. Corps Gras)

INSTALLATION FOR HYDRATION OF OILSEEDS. G.V. Zarembo et al. *Maslo-zhir. Promst.* 1978(9), 40. (Rev. Fr. Corps Gras)

UNSATURATED ALCOHOLS FROM COTTONSEED OIL SOAPSTOCK. R.A. Gorbatcheva et al. *Maslo-zhir. Promst.* 1978(9), 18-20. (Rev. Fr. Corps Gras)

STUDY OF THE DIELECTRIC CHARACTERISTICS OF SOYBEAN OIL. A.N. Tournanov et al. *Maslo-zhir. Promst.* 1978(9), 10-11. (Rev. Fr. Corps Gras)

METHOD OF SEPARATION BY GAS-LIQUID CHROMATOGRAPHY OF THE PENTAERYTHRITOL ESTERS. N.S. Krivitch. *Maslo-zhir. Promst.* 1979(3), 44-5. (Rev. Fr. Corps Gras)

INFLUENCE OF THE TREATMENT OF COTTONSEED OIL SOAPSTOCK ON NON-LIPIDIC MATTERS OF RAW AND DISTILLED FATTY ACIDS. R.L. Malinekevitch et al. *Maslo-zhir. Promst.* 1979(3), 25-7. (Rev. Fr. Corps Gras)

PRIMARY PURIFYING OF SUNFLOWER OIL OBTAINED BY PRESSING ON A FILTER MODERNIZED WITH A DISC AND WITH A CENTRIFUGAL DISCHARGE OF THE DEPOSIT. V.R. Zherebiatev et al. *Maslo-zhir. Promst.* 1979(3), 21-3. (Rev. Fr. Corps Gras)

UTILIZATION OF UNSATURATED FATTY ACIDS FROM COTTONSEED OIL SOAPSTOCK FOR THE ENRICHMENT OF ORES BY FLOTATION. N.M. Kazakova et al. *Maslo-zhir. Promst.* 1979(2), 36-7. (Rev. Fr. Corps Gras)

INFLUENCE OF THE TEMPERATURE OF HYDROTHERMAL TREATMENT ON THE THERMOPHYSICAL PROPERTIES OF THE COTTONSEED MEAL. P.M. Rachidov et al. *Maslo-zhir. Promst.* 1979(2), 13. (Rev. Fr. Corps Gras)

DETERMINATION OF THE COMPOSITION OF SYNTHETIC MONOOXYSTEARIC ACIDS. E.N. Pavlikova et al. *Maslo-zhir. Promst.* 1979(1), 20-1. (Rev. Fr. Corps Gras)

STUDY OF THE PROPERTIES OF PHOSPHATIDE CONCENTRATE OF SUNFLOWER OBTAINED BY DIFFERENT TECHNOLOGICAL SCHEMES. S.N. Volotovskaya et al. *Troudy VNIIZha* 33, 13-19 (1977). It was established that the samples of sunflower phosphatide concentrates obtained by the method of hydration followed by film drying in vacuum were of a superior quality compared with concentrate obtained following the scheme with separation on the plateau decanters. (Rev. Fr. Corps Gras)

VARIATION OF QUALITY OF MARGARINE DURING STORAGE. L.A. Galoun et al. *Pishch. Tekhnol.* 1978(5), 44-6. During storage of ERA margarine and of milk table margarine at a temperature of 5 to 7C for 65 days, the water content decreased significantly. The oxidation and hydrolysis of lipids occur slowly. The deterioration of the quality of superficial layer of margarine was observed after 7 days of storage following the color modification and after 21 days, following the appearance of an aftertaste and of a strange odor. (Rev. Fr. Corps Gras)

COMPLEXES OF PHOSPHOLIPIDS OF SUNFLOWER OIL WITH METALS. E.P. Kornena et al. *Maslo-zhir. Promst.* 1978(5), 12-13. The particular groups of nonhydratable phospholipids show a selectivity for interaction with metals: the phosphatidylinositols form complexes with all the studied metals; the phosphatidylserines, the polyphosphatidic and phosphatidic acids form complexes with the bivalent metals, while the phosphatidylethanolamines form complexes only with the monovalent metals. (Rev. Fr. Corps Gras)

MODIFICATION OF LIPIDS OF THE SUPERFICIAL LAYER OF MARGARINE DURING STORAGE. V.P. Dediukhina et al. *Vopr. Pitaniya* 1978(3), 69-72. During the storage of the Era and Stolovey milk-margarine (table margarine) at a temperature of 5 7C during the guaranted period (45 days), the oxidation process of the lipids of the superficial layer was not observed. The beginning of this process was observed during a storage of 65 days. (Rev. Fr. Corpa Gras)

KINETIC STUDY OF THE OXIDATION OF REFINED SUNFLOWER OILS STORED UNDER COMMERCIAL CONDITIONS IN BULGARIA. G. Shunanov et al. *Maslo-sapunena. Promst.* 1978(1), 22-32. The sunflower oils were stored in 1 liter dark bottles, in a closed room (4-10C), or under canvas covers, in free air. After 105 days of storage in a closed room and 120 days under canvas covers, the oils appear degraded and the oxidation increased. Refined sunflower oils, enriched in vitamin E and stabilized under nitrogen, then stored in bottles, showed good organoleptic qualities for a longer period of time; the oxidative changes are minimal. (Rev. Fr. Corps Gras)

SUBSTITUTION OF SOYBEAN MEAL BY SUNFLOWER MEAL IN CHICKEN FODDER. S. Sandev et al. *Maslo-sapunena. Promst.* 1977(4), 467-73. Chickens were fed mixtures of corn, soybean, sunflower, and fish meal. In these combinations, a part of the soybean was replaced by sunflower meal and by corn. In this way, the content of proteins in the mixture was decreased, but this effect was compensated by the addition of synthetic lysine. The results were positive. There remains, however, the diminishing of the fiber content of the sunflower meal before it can replace soybean meal completely. (Rev. Fr. Corps Gras)

ELIMINATION BY ADSORPTION OF PHOSPHORIC ACID FROM OILS AND SEEDS. S.N. Volotovskaya et al. *Troudy VNIIZha* 33, 128-33 (1977). The elimination of excess phosphoric acid by adsorbents from the water and oil phases is done in a different way. In the water medium (polar), the reaction of neutralization is predominant, while in the oil medium, a process of sorption is present. The alkaline activated carbon and the activated bleaching earths are convenient for the elimination of excess acid. (Rev. Fr. Corps Gras)

INFLUENCE OF TECHNOLOGY AND REFINING OF SUNFLOWER OILS ON THE MATERIALS ACCOMPANYING THE GLYCERIDES. T.B. Morozova et al. *Troudy VNIIZha* 33, 24-30 (1977). In the oils obtained by double or triple pressing, the content of tocopherols, sterols, and carotenes was unchanged, while the content of xanthophylls, chlorophylls, and pheophytines increased with the degree of pressing. The tocopherol content of oils obtained by pre-pressing—extraction is about 1.5 times higher than in corresponding oils obtained only by prepressing. Deodorization at temperatures above 200C and at 1 2 mmHg caused a significant decrease of tocopherol. (Rev. Fr. Corps Gras)

MODIFICATION OF THE DITTMER-LESTER REAGENT FOR THE DETECTION OF PHOSPHOLIPID DERIVATIVES ON THIN-LAYER CHROMATOGRAMS. E.K. Ryu and M. MacCoss (Div. of Biol. and Med. Res., Argonne Nat. Lab., Argonne, IL) *J. Lipid Res.* 20, 561-3 (1979). A simple modification of the Dittmer-Lester reagent is described that allows the detection of phospholipid derivatives at very low concentrations on silica gel and reversed-

phase thin-layer plates. This modification, which involves the addition of acetic acid to the mixture, permits the observation of sharp blue spots on a white background. The specificity and sensitivity of the spray are discussed.

THE PHASE BEHAVIOR OF HYDRATED CHOLESTEROL. C.R. Loomis, G.G. Shipley and D.M. Small (Biophys. Div., Dept. of Med., Boston Univ. Schl. of Med., Boston, MA) *J. Lipid Res.* 20, 525–35 (1979). The thermotropic phase behavior of cholesterol monohydrate in water was investigated by differential scanning calorimetry, polarizing light microscopy, and x-ray diffraction. In contrast to anhydrous cholesterol which undergoes a polymorphic crystalline transition at 39°C and a crystalline to liquid transition at 151°C, the closed system of cholesterol monohydrate and water exhibited three reversible endothermic transitions at 86, 123, and 157°C. The observation of a smectic liquid crystalline phase for hydrated cholesterol correlates with its high surface activity and helps to explain its ability to exist in high concentrations in biological membranes.

THE LIPID COMPOSITION OF THE ELECTRIC ORGAN OF THE RAY, TORPEDO MARMORATA, WITH SPECIFIC REFERENCE TO SULFATIDES AND Na^+-K^+-ATPASE. G.C. Hansson, E. Heilbronn, K.-A. Karlsson and B.E. Sammuelsson (Dept. of Med. Biochem., Univ. of Goteborg, Goteborg, Sweden) *J. Lipid Res.* 20, 509–18 (1979). The lipids from the electric organ of the ray, *Torpedo marmorata,* have been isolated and characterized. The major lipids were cholesterol, choline phospholipids, ethanolamine phospholipids, and sphingomyelins. The major fatty acids of ethanolamine phospholipids were 18:1, 18:0, 22:6, and 20:4. The ratio of the activity of Na^+-K^+-dependent ATPase (EC 3.6.1.3) and the concentration of sulfatides was similar to ratios found for other tissues with normal and increased Na^+ and K^+ transporting capacity. The significance of this finding is discussed.

LIPID COMPOSITION OF HUMAN NEURAL TUMORS. A.J. Yates, D.K. Thompson, C.P. Boesel, C. Albrightson and R.W. Hart (Dept. of Path., Ohio State Univ., Columbus, OH) *J. Lipid Res.* 20, 428-36 (1979). Gangliosides, cholesterol and phospholipids were quantitated in the tissues of 11 human neural tumors and the cells of two gliomas cultured in vitro. All tumor tissues contained higher water concentrations but lower total lipid concentrations than either human grey or white matter. In general they contained less cholesterol, sphingomyelin, and serine glycerophospholipid but more choline glycerophospholipid than white matter. There were significant amounts of choline and ethanolamine plasmalogens in both cultures and parent tissues. The ganglioside patterns of both cultures were complex but they contained a greater proportion of structurally simpler gangliosides than their parent tissues.

PROTON MAGNETIC RESONANCE IDENTIFICATION AND DISCRIMINATION OF STEREOISOMERS OF C_{27} STEROIDS USING LANTHANIDE SHIFT REAGENTS. T. Iida, M. Kikuchi, T. Tamura, and T. Matsumoto (Dept. of Industrial Chem., Faculty of Engineering, Nihon Univ., Koriyama-shi, Fukushima-ken, Japan) *J. Lipid Res.* 20, 279–84 (1979). A simple proton magnetic resonance spectroscopic method is described for the identification and confirmation of several stereoisomeric pairs of C_{27} stanols as well as their keto and acetate derivatives related to cholesterol. The method, which involves the use of lanthanide shift reagents, is useful in distinguishing clearly between the isomeric pairs differing only in the geometry of a functional group and/or of the A/B-ring junction in the steroid skeleton.

SYNTHESIS OF ALL-CIS-1,3-DIACYLCYCLOPENTANE-1,2,3-TRIOL-2-PHOSPHATE VIA ACYL GROUP MIGRATION IN A CYCLIC DIGLYCERIDE ANALOG. A.J. Hancock and M.D. Lister (Dept. of Chem., Univ. of Missouri, Kansas City, MO) *J. Lipid Res.* 20, 271–4. The acid-catalyzed isomerization of the diglyceride analog (1,2,3/0)-1,2-dipalmitoylcyclopentane-1,2,3-triol has been used to generate *syn-syn*-1,3-diacylcyclopentane-1,2,3-triol, a required intermediate in the synthesis of a symmetrical all-*cis*-1,2,3/0-2P cyclopentanoid phosphatidic acid analog. The all-*cis* cyclophosphatidic acid analog has therefore been obtained in the free acid form and as the diphenyl ester, and dipotassium salt derivatives.

INTERACTIONS OF CHOLESTEROL ESTERS WITH PHOSPHOLIPIDS: CHOLESTERYL MYRISTATE AND DIMYRISTOYL LECITHIN. M.J. Janiak, D.M. Small and G.G. Shipley (Biophys. Div., Depts. of Med. and Biochem., Boston Univ. Schl. of Med., Boston, MA) *J. Lipid Res.* 20, 183–99 (1979). The ternary phase diagram of cholesteryl myristate-dimyristoyl lecithin-water has been determined by polarizing light microscopy, scanning calorimetry, and x-ray diffraction. Comparison with other phospholipid-cholesterol ester-water phase diagrams suggest the following general principles: i) the incorporation of cholesterol ester occurs only into liquid crystalline phospholipid bilayers, ii) the extent of incorporation is temperature-dependent, with increasing amounts of cholesterol ester being incorporated at higher temperatures, and iii) unsaturated cholesterol esters induce increased disordering of the phospholipid bilayers.

FATTY ACIDS, PART 54. SOME REACTIONS OF LONG-CHAIN OXYGENATED ACIDS WITH SPECIAL REFERENCE TO THOSE FURNISHING FURANOID ACIDS. F.D. Gunstone and R.C. Wijesundera (Dept. of Chem., The Purdie Build., The Univ. of St. Andrews, Scotland KY16 9ST, UK) *Chem. Phys. Lipids* 24, 193–208 (1979). C_{18} furanoid acids are prepared from natural oxygenated acids by palladium (II)-catalysed cyclodehydrogenation, by rearrangement of epoxides with iodopropane-sodium iodide-demethylsulphoxide, and by dehydration of endoperoxides. Some reactions give mixed products but routes to the individual 10,13-, 9,12-, and 8,11-furans are reported. The endoperoxide route leads to speculation about the biosynthesis of natural furanoid acids.

STUDIES IN MEMBRANE PROCESSES X: A DEUTERIUM MAGNETIC RESONANCE STUDY OF DIPALMITOYL LECITHIN AND PALMITIC ACID GUESTS IN MAGNETICALLY-ORIENTED HEXADECYLTRIMETHYLAMMONIUM BROMIDE LIQUID CRYSTALLINE SYSTEM. B.J. Forrest and L.W. Reeves (Dept. of Chem., Univ. of Waterloo, Waterloo, Ontario, Canada) *Chem. Phys. Lipids* 24, 183–92 (1979). The membrane phospholipid, dipalmitoyl lecithin, deuterium labelled in its fatty acyl chains, and palmitic acid-d_{31} have been incorporated into the same bilayer model membrane, a lyotropic liquid crystalline hexadecyltrimethylammonium bromide mesophase which spontaneously orients in an applied magnetic field. The order parameter profiles for the lecithin and palmitic acid, and that of the host detergent are quite different indicating that the ordering of the incorporated lipids is not dictated by surrounding detergent molecules, but rather the order imposed is a function of the nature of chemical anchoring of the hydrophilic headgroups of individual molecules at the bilayer interface.

THE CRYSTAL STRUCTURE OF CHOLESTERYL OCTANOATE. B.M. Craven and N.G. Guerina (Dept. of Crystallography, Univ. of Pittsburgh, Pittsburgh, PA) *Chem. Phys. Lipids* 24, 157–66 (1979). Crystals of cholesteryl octanoate ($C_{35}H_{60}O_2$) are monoclinic, space group $P2_1$, with $a = 12.80(3)$, $b = 9.20(2)$, $c = 14.12(3)$Å, $\beta = 93.81(3)°$ and 2 molecules per unit cell. The molecules are arranged in monolayers with their long axes antiparallel and severely tilted (28°). There is a close packing of cholesteryls within the monolayers, but the octanoate chains which form the layer interface regions are conformationally and thermally disordered. The crystal structure is quite different from that of cholesteryl nonanoate, as expected from the discontinuity in thermodynamic properties and phase behaviour which occurs at this point in the homologous series.

THE SYNTHESIS OF A PERDEUTERATED PHOSPHOLIPIDS 1,2-DIMYRISTOYL-SN-GLYCERO-3-PHOSPHOCHOLINE-D_{72}. P.B. Kingsley and G.W. Feigenson (Sec. of Biochem., Molecular and Cell Biol., Clark Hall, Cornell Univ., Ithaca, NY) *Chem. Phys. Lipids* 24, 135–147 (1979). The synthesis of a perdeuterated phospholipid—1,2-dimyristoyl-*sn*-glycero-3-phosphocholine-d_{72}—is described. Ordinary (protonated) DMPC was prepared by the same synthetic route and its properties were found to be the same as those of commercial DMPC. The uses of partially deuterated and perdeuterated phospholipids in NMR studies are discussed.

MOLECULAR ARRANGEMENTS IN SPHINGOLIPIDS. THERMOTROPIC PHASE BEHAVIOUR OF TETRACOSANOYLPHYTOSPHINGOSINE. B. Dahlen and I. Pascher (Dept. of Structural Chem., Inst. of Med. Biochem., Univ. of Goteborg, S-400 33 Goteborg, S-400 33 Goteborg, Sweden) *Chem. Phys. Lipids* 24, 119–33 (1979). The phase behaviour of a ceramide species containing C_{18}-phytosphingosine and C_{24}-fatty acid was studied by X-ray diffraction methods, in order to elucidate the packing principles of lipids with unequally long hydrocarbon chains. Six solid phases were observed. Only one case was observed, in which the molecules pack with their two chains parallelly stacked in a double layer arrangement in which the long fatty acid tails deeply interdigitate between the two opposite layer halves. In a natural membrane containing different lipids, however, long fatty acid tails probably arrange randomly and contribute

to the formation of a liquid hydrocarbon zone in the center of the bilayer.

SYNTHESIS OF SPECIFICALLY DEUTERATED SATURATED AND UNSATURATED PHOSPHATIDYLSERINES. J. Browning and J. Seelig (Dept. of Biophys. Chem., Biocentre of the Univ. of Basel, Klingelbergstrasse 70, CH-4056 Basel, Switzerland) *Chem. Phys. Lipids* 24, 103–18 (1979). A facile chemical synthesis of 1,2-dioleoyl and 1,2-dimyristoyl-*sn*-glycero-3-phospho-L-serine as well as the synthesis of several deuterated derivatives of phosphatidylserine (2 and 3 positions of serine and in the 3-glycerol position) are described. 360 MHz ^1H NMR spectra of phosphatidylserine and the optical activity of various phosphatidylserine diastereomers were measured.

PHOSPHOLIPID LATERAL PHASE SEPARATION AND THE PARTITION OF CIS-PARINARIC ACID AND TRANS-PARINARIC ACID AMONG AQUEOUS, SOLID LIPID, AND FLUID LIPID PHASES. L.A. Sklar, G.P. Miljanich, and E.A. Dratz (Div. of Natural Sci., Univ. of California at Santa Cruz, Santa Cruz, CA) *Biochemistry* 18, 1707–16 (1979). The partition of *cis*-parinaric acid (9,11, 13,15-*cis, trans,trans,cis*-octadecatetraenoic acid, *cis*-PnA) and *trans*-parinaric acid (9,11,13,15-*all-trans*-octadecatetraenoic acids, *trans*-PnA) among aqueous, solid lipid, and fluid lipid phases has been measured by three spectroscopic parameters: absorption spectral shifts, fluorescence quantum yield, and fluorescence polarization. The solid lipid was dipalmitoylphosphatidylcholine (DPPC); the fluid lipid was palmitoyldocosahexaenoylphosphatidylcholine (PDPC). It is concluded that measurements of PnA fluorescence polarization vs. temperature are better suited than measurements of quantum yield vs. temperature for determining phospholipid phase separation.

ISOLATION AND STRUCTURE OF DIGLYCOSYSTEROLS AND TRIGLYCOSYLSTEROLS IN RICE BRAN. Y. Fujino and M. Ohnishi (Dept. of Agr. Chem., Obihiro Univ., Obihiro, Hakkaido, Japan) *Biochim. Biophys. Acta* 574, 94–102 (1979). Novel oligoglycosylsterols, a series of sterylglycosides, were detected in the glycolipids of rice bran, and di- and triglycosylsterols were isolated and their structures were investigated. The principal sterol components were sitosterol, campesterol and stigmasterol; glucose was the only component sugar. The major species of diglycosylsterols and triglycosylsterol were characterized as D-glucopyranosyl-(β1 → 4)-D-glucopyranosyl-(β1 → 3′)-sitosterol, i.e. cellobiosylsitosterol, and D-glucopyranosyl-(β1 → 4)-D-glucopyranosyl-(β1 → 4)-D-glucopyranosyl-(β1 → 3′)-sitosterol, i.e. cellotrisylsitosterol, respectively.

EVALUATION OF SOME EGYPTIAN SWEET MELON SEED OILS. S.B. El-Magoli, M.M. Morad and A.A. El-Fara, *Fette, Seifen, Anstriehm.* 81, 201 (1979). The physico-chemical properties of two kinds of Egyptian sweet melon seed oils (King Bahtim and Malty Bahtim) were investigated. The amount of oil extracted from King Rahtim reached 34% while in the other kind this percentage reached 36%. The oil extracted has high acid and iodine values in both kinds in comparison with cotton seed oil. Fatty acid composition by GLC for the two kinds revealed the presence of linolenic, linoleic, oleic, stearic, palmitic and myristic acid in different proportions. The variety of the seeds influences to a great extent the amount of saturated and unsaturated fatty acids. Oil stability investigations in a Warburg apparatus indicated that King Bahtim variety reached the maximum absorption of oxygen after 17 days, while Malty Bahtim variety needs 20 days to reach the same maximum absorption. On the other hand chemical analysis of the residual meal indicated the probability of its usage in animal feed as it contains a high amount of protein and fibers. The residual meal can be considered also as a good source for both phosphorus and potassium.

• Biochemistry and Nutrition

LEUCINE AS AN IN VITRO PRECURSOR TO LIPIDS IN RAT SCIATIC NERVE. L.W. Stillway, D.A. Weigand and M.G. Buse, (Dept. of Biochem. and Med. Med. Univ. of South Carolina, Charleston, South Carolina 29403) *Lipids* 14, 127–31 (1979). The in vitro incorporation of leucine, isoleucine and pyruvate into lipids was compared and the possibility that leucine might serve as an *in situ* precursor to the corresponding *iso* fatty acids in the rat sciatic nerve was studied. The relative incorporation of ^{14}C from leucine into lipids vs. nonlipids was 20%, and the incorporation of label into total lipids from leucine was one-half that from pyruvate. The incorporation of label from leucine and pyruvate into sterols was nearly equivalent, but the incorporation of label into all other lipid classes from leucine was less than that from pyruvate, and the incorporation of label from isoleucine into lipids was much less in all cases. No detectable label from leucine was incorporated into branched chain fatty acids. It is concluded that leucine may be a substantial in vitro precursor to all major lipids in peripheral nerve, especially sterols. The possibility and significance of a leucine catabolic pathway in the cytosol in relation to availability of 3-hydroxy-3-methylglutaryl CoA for sterol biosynthesis is discussed.

EFFECTS OF OXANDROLONE ON PLASMA LIPOPROTEINS IN PATIENTS WITH TYPE IIA, IIB AND IV HYPERLIPOPROTEINEMIA: OCCURRENCE OF HYPO-HIGH DENSITY LIPOPROTEINEMIA. T. Tamai, T. Nakai, S. Yamada, T. Kobayashi, T. Hayashi, Y. Kutsumi and R. Takeda, (The Second Dept. of Internal Med., Schl. of Med., Kanazawa Univ., 13–1, Takaramachi, Kanazawa City, Japan 920) *Artery* 5, 125–43 (1979). The effects of oxandrolone on plasma lipids and lipoprotein composition in patients with type IIa, IIb and IV hyperlipoproteinemia were investigated. Oxandrolone (4 mg/day, for 28 days) induced a significant reduction in plasma and VLDL triglyceride. Reciprocal elevation of LDL cholesterol was observed in 8 of 10 type IV patients and in 2 of 5 type IIb patients.

EFFECT OF MARINE OIL AND RAPESEED OIL ON COMPOSITION OF FATTY ACIDS IN LIPOPROTEIN TRIACYLGLYCEROLS FROM RAT BLOOD PLASMA AND LIVER PERFUSATE. M.S. Thomassen, E. Strom, E.N. Christiansen and K.R. Norum, (Inst. for Nutr. Res., Univ. of Oslo, Blindern, Oslo 3, Norway) *Lipids* 14, 58–65 (1979). The fatty acid patterns of triacylglycerols (TG) from very low density lipoprotein (VLDL) in blood plasma and liver-perfusate from rats fed partially hydrogenated marine oil or rapeseed oil were determined. The results indicated that the liver exported the very long chain fatty acids and that an adaptation took place after three days feeding with rapeseed oil or marine oil. This adaptation in the liver could possibly explain why TG accumulation in hearts, which appears after three days' feeding with rapeseed oil or marine oil, disappears after an extended feeding period.

HIGH AND LOW DENSITY LIPOPROTEIN CHOLESTEROL LEVELS IN HYPERCHOLESTEROLEMIC SCHOOL CHILDREN. J.A. Morrison, I. deGroot, K.A. Kelly, B.K. Edwards, M.J. Mellies, S. Tillett, P. Khoury and C.J. Glueck, (Dept. of Med., Univ. of Cincinnati, College of Med., Cincinnati General Hosp., 234 Goodman St, Cincinnati, OH) *Lipids* 14, 99–104 (1979). This report focuses upon C-HDL and C-LDL levels in children identified in a lipid and lipoprotein sampling survey of 6,775 Princeton School children, by either total plasma cholesterol 205 mg/dl, the approximate 95th percentile for children 6–17 years of age, or age-, sex-, and race-specific 95th percentiles for cholesterol. However, when selection for hypercholesterolemia was based on age-, sex-, and race-specific 95th percentile cholesterol levels, there were no differences in the proportion of black and white children having elevations of C-HDL and C-LDL, accounting for their hypercholesterolemia.

NEUROGENIC REGULATION OF LIPID METABOLISM IN THE RABBIT. A MECHANISM FOR THE CHOLESTEROL-LOWERING EFFECT OF ACUPUNCTURE. C-C. Wu and C-J. Hsu, (Dept. of Med. Natl Taiwan Univ. Hosp. 1, Chang-Te St. Taipei Taiwan) *Atherosclerosis* 33, 153–64 (1979). Plasma and aortic cholesterol levels are known to fall significantly after needling at the specific point which is innervated by a branch of the deep peroneal nerve. Different types of stimulation were applied to the specific nerve, using solely needling, injection of normal saline with needling and injection of a small dose of novocain with needling at the specific point in several groups of rabbits fed a high cholesterol diet for two or three weeks. Significant decreases in plasma and aortic cholesterol were obtained in the combined acupuncture group after one to two weeks of acupuncture. When the specific point was blocked by injection of a larger dose of novocain or the deep peroneal nerve was cut, then needling at the specific point lost its hypocholesterolemic effect. It is thus suspected that stimulation of sensory receptors of the deep peroneal nerve at the specific point may be the mechanism of the cholesterol-lowering action of acupuncture.

DISTRIBUTION OF HIGH DENSITY AND OTHER LIPOPROTEINS IN SELECTED LRC PREVALENCE STUDY POPULATIONS: A BRIEF SURVEY. B.M. Rifking, I. Tamir, G. Heiss, R.B. Wallace and H.A. Tyroler, (Lipid Metabolism Branch, National Heart,

Lung and Blood Inst., Bethesda, Maryland) *Lipids* 14, 105–12 (1979). Selected lipid and lipoprotein data from the Lipid Research Clinics (LRC) Prevalence Study are presented, with particular emphasis given to high-density lipoprotein (HDL) values. Cross-sectional age- and sex-specific mean values are shown for 7007 white participants in the ten North American LRCs. Comparisons are drawn for males and females (including the pediatric group) and for females using or not using sex hormones. The US-USSR Collaborative Program is summarized, and selected comparisons are noted for the Soviet and United States samples.

INCORPORATION OF DEUTERIUM LABELED CIS- AND TRANS-9-OCTADECENOIC ACID IN HUMANS:PLASMA, ERYTHROCYTE, AND PLATELET NEUTRAL LIPIDS. E.A. Emken, W.K. Rohwedder, H.J. Dutton, W.J. DeJarlais, R.O. Adlof, J. Mackin, R. Dougherty, and J.M. Iacono, *Metabolism* 28, 575–83 (1979). Mixtures of specifically deuterated triolein and trielaidin were fed to three subjects, and the incorporation of these labeled fats into human plasma, erythrocyte, and platelet neutral lipids was followed by gas chromatography—mass spectrometry analysis. Plasma triglycerides selectively incorporated 10% more oleic acid than elaidic acid. Plasma cholesterol ester samples contained three times more oleic acid than claidic acid. Plasma free fatty acid fractions also contained about 25% more claidic acid than oleic acid. Low levels of deuterated fatty acids were found in the platelet neutral lipids. These samples followed the same general selectivities observed in the plasma samples. Uptake of elaidic acid by blood lipids confirms selectivities and distribution patterns previously reported in animal and in vitro studies. A 28% deuterium isotope effect due to deuterium on the fatty acid double bond was observed in the cholesteryl ester samples when oleic-9,10-d_2 acid was fed against oleic-8,8,13,13,14,14,-d_6 acid. No evidence for a similar isotope effect was found for deuterated fatty acid incorporation into triglycerides and free fatty acid fractions.

CHOLESTEREMIA IN JAPANESE QUAIL: RESPONSE TO A MIXTURE OF VITAMINS C AND E AND CHOLINE CHLORIDE. R.B. Morrissey and W.E. Donaldson, (North Carolina State Univ., Dept. of Poultry Sci., Raleigh, NC) *Artery* 5, 182–92 (1979). Five-week old, male, Japanese quail *(Coturnix coturnix japonica)* were given *ad libitum* access to glucose-soybean meal-10% fat diets containing 0, 0.25, 0.5, or 1% cholesterol, with or without the addition of a vitamin supplement (vitamin C—1 g/kg of diet, vitamin E—30 I.U./kg of diet and choline chloride—5.5 g/kg of diet). After 12 weeks, 9 quail from the 24 quail fed each diet were killed and the total cholesterol concentration of serum, liver, kidney, and aorta was determined. Cholesterol concentrations of these organs increased with increasing levels of dietary cholesterol. No significant effect of vitamin supplementation on organ cholesterol concentration was noted at 24 weeks although serum cholesterol concentration was significantly lower for the vitamin-fed groups at all levels of dietary cholesterol.

THE IMPORTANCE OF THE STERIC CONFIGURATION OF LYSOPHOSPHATIDYLCHOLINE IN THE LYMPHATIC TRANSPORT OF FAT. P.J.A. O'Doherty, (G.F. Strong Lab. for Med. Res., Dept. of Med., Univ. of British Columbia, Vancouver, B.C. Canada V5Z 1M9) *Lipids* 14, 84–7 (1979). The importance of the steric configuration of lysophosphatidylcholine in the lymphatic transport of fat was investigated in bile fistula rats. It was found that the feeding of 1-palmitoyl-*sn*-glycero-3-phosphocholine increased the lymphatic output of phosphatidylcholine and triacylglycerol, while the feeding of 3-palmitoyl-*sn*-glycero-1-phosphocholine had no effect. The significance of these findings is briefly discussed.

DIET-INDUCED ALTERATIONS IN THE DISCOID SHAPE AND PHOSPHOLIPID FATTY ACID COMPOSITIONS OF RAT ERYTHROCYTES. G.A. Rao, K. Siler and E.C. Larkin, (Hematology Res. Lab., Veterans Admin. Med. Center, Martinex, CA) *Lipids* 14, 30–8 (1979). For eight weeks young male rats were fed diets rich in 18:2 (stock diet, or 10% corn oil, CO) or those devoid of 18:2 (fat free, FF, or 10% hydrogenated coconut oil, HCNO). When 18:2 was excluded, an increase in the level of 16:1, 18:1 and 20:3 and a decrease in 18:2 was observed in the fatty acids of red cells. The exclusion of 18:2 for even a few days decreased the proportion of discocytes. The loss of discoid shape was reversed in a few days by feeding an 18:2-rich diet. Fatty acid analysis of erythrocytes of rats on the various dietary manipulations showed that the change in the proportion of discocytes followed the change in the level of 18:2.

SERUM LIPOPROTEIN LIPIDS AFTER GEMFIBROZIL TREATMENT. P. Schwandt, P. Weisweiler and G. Neureuther, (2nd Med. Clin., Klinikum Grosshadern, Univ. of Munich) *Artery* 5, 117–24 (1979). The changes of serum lipoprotein lipids including the phospholipids of twelve hyperlipoproteinemic patients were studied after a four weeks treatment with 1,200 mg/day gemfibrozil. There was a decrease of all VLDL lipids as well as of LDL and HDL triglycerides and an increase of HDL cholesterol. The phospholipids were influenced in different directions, particularly their concentration in the HDL was constant.

ISOLATED BRAIN CAPILLARY ENDOTHELIA: INFLUENCE OF VARIOUS LEVELS OF ESSENTIAL FATTY ACIDS ON THE ACYL GROUP COMPOSITION OF GLYCEROPHOSPHOLIPIDS. D.P. Selivonchick and B.I. Roots, (Dept. of Zoology, Univ. of Toronto, Mississauga, Ontario, Canada L5L 1C6) *Lipids* 14, 66–9 (1979). On day seven of gestation, Wistar rats were assigned to a high essential fatty acid (EFA), low EFA, or a fat free diet. The same diets were continued during lactation. On weaning, the offspring were fed the same diets as their mother. Rats were killed at 222 days, brain capillary endothelia isolated, and total lipids extracted from the purified capillaries. The composition of the constituent fatty acids of ethanolamine glycerophospholipid (EGP), choline glycerophospholipid (CGP), and the alk-1-enyl EGP composition from each diet is reported.

INFLUENCE OF ORAL CONTRACEPTIVES ON ASCORBIC ACID AND TRIGLYCERIDE STATUS. N.K. Hudiburgh and A.N. Milner. *J. Am. Diet. Assoc.* 75, 19 (1979). Ascorbic acid and triglyceride concentrations were determined in fifteen users and fifteen non-users—all college students—of oral contraceptives on three days during one menstrual or oral contraceptive cycle. There were no significant differences in either ascorbate or triglyceride concentrations between the groups, or within the period of menstrual or drug cycle. All triglyceride and ascorbate concentrations were in the normal range. Nutrient intake was adequate in both groups for all nutrients except iron. The data indicate that, with adequate ascorbic acid intake, there is no threat to ascorbic acid status incident to oral contraceptive use.

NUTRITIONAL EFFECT OF LOW-ERUCIC RAPESEED OILS ON PIGS: 1. DEVELOPMENT OF ANIMALS AND CARCASS CHARACTERISTICS. U. Petersen, H.-J. Oslage and A. Seher (Bundesforschungsanstalt für Landwirtschaft (FAL), Braunschweig, und der Bundesanstalt für Fettforschung, Münster) *Fette, Seifen, Anstrichm.* 81, 177 (1979). In a feeding experiment (17 weeks, 20 kg to 110 kg body weight) with 94 castrated males (Deutsche Landrasse) from a SPF colony the influence of type of fat, amount of fat, and concentration of erucic acid on growth, feed utilization, quality of slaughtered carcass, and development of some organs were studied. The feeds examined were a barley-soya ration with 2% residual fat without addition of fat, two soybean oil groups with 4% and 8% added fat, six mixed rapeseed oil groups with three different erucic acid concentrations (7.5%, 15%, 22.5%) at levels of 6% and 10% total fat in feed, as well as a Lesira oil group with 1.7% erucic acid at a level of 10% fat in feed. The daily increase on an average of all experimental groups was 0.76 kg and the feed utilization index (digestible energy) was similar in all experimental groups. Remarkable effects on the quality of slaughtered carcass were not detected. The relative mass of heart, kidney, spleen, and thyroids did not show any distinct alterations that were related to the dietary treatment. The liver was found to be distinctly heavier in the mixed rapeseed oil groups fed 10% fat in the feed; moreover, the effect of the amount of erucic acid was also observed. The adrenals of the mixed rapeseed oil groups were significantly lighter than those of the other groups; a relationship to the fat concentration or erucic acid concentration was not found.

NUTRITIONAL EFFECT OF LOW-ERUCIC RAPESEED OILS ON PIGS: 2. EFFECT ON LIPIDS OF HEART MUSCLE. A. Seher, M. Arens, M. Krohn and U. Petersen (Bundesanstalt für Fettforschung, Münster, und der Bundesforschungsanstalt für Landwirtschaft (FAL), Braunschweig) *Fette, Seifen, Anstrichm.* 81, 181 (1979). The effect of various mixtures of rapeseed oils (7.5–22.5% erucic acid) and of Lesira oil (1.7% erucic acid) in comparison to that of soybean oil and a low-fat barley-soybean meal feed on the lipids of heart muscle of pigs is reported. Neither after 17 days nor after 17 weeks of experimental feeding does lipidosis of heart muscle or short term accumulation of erucic acid in heart muscle occur. The incorporation of erucic acid into the total lipids of heart muscle exhibited

linear dependence (maximum 2.1%) on dose. The influence of composition and amount of dietary fat on the concentration of individual fatty acids of total lipids of heart have been studied. The increased conversion of dietary linolenic acid to ω3-docosahexaenoic acid after feeding rapeseed oil, as found in the rat, is not observed in the pig.

NUTRITIONAL EFFECT OF LOW-ERUCIC RAPESEED OILS ON PIGS: 3. EFFECT ON DEPOT FAT AND LIVER LIPIDS. A. Seher, G. Werner, M. Krohn and U. Petersen (Bundesanstalt für Fettforschung, Münster, und der Bundesforschungsanstalt für Landwirtschaft (FAL), Braunschweig) *Fette, Seifen, Anstrichm.* 81, 187 (1979). After feeding pigs for 17 and 119 days, respectively, the back fat, intestinal fat, and liver lipids were examined in order to study the effect of the type and amount of fat on these organs. Different mixtures of rapeseed oils containing up to 22.5% erucic acid as well as the low-erucic Lesira Oil did not have any negative effect on the tissues analyzed. The concentration of palmitic acid and linoleic acid in the tissue lipids showed characteristic dependence on the concentration of fat in the diet (palmitic acid) or on the total amount fed (linoleic acid). The conversion of linoleic acid to arachidonic acid in the liver seems to be influenced by the linolenic acid content of the dietary fat.

NUTRITIONAL EFFECT OF LOW-ERUCIC RAPESEED OILS ON PIGS: 4. HISTOMETRY OF MYOCARDIAL CHANGES. G.M. Bijster, W.G. Timmer and R.O. Vles (Unilever Research, Vlaardingen) *Fette, Seifen, Anstrichm.* 81, 192 (1979). The objective of this histopathological study—part of a larger collaborative trial—was to investigate the influence of type, level and erucic acid content of dietary fat on the frequency and severity of myocardial changes in growing pigs. Sixty-eight castrated pigs were allotted to ten dietary treatments comprising a low fat diet and regimens supplemented with soybean oil or with three mixtures of rapeseed oils. The mixtures of rapeseed oils contained 7.5, 15 or 22.5% erucic acid, respectively. A tenth group was fed low-erucic rapeseed oil (Lesira). The experiment lasted 17 weeks. The hearts were sampled systematically yielding 28 samples per heart. All sections were screened and those showing areas of muscle cell necrosis were submitted to a detailed histometric investigation. Pigs fed for 17 weeks rapeseed oil mixtures or low-erucic-acid rapeseed oil did not display more or more severe lesions than animals fed either soybean oil or a low fat diet. Neither the level nor the nature of the fat in the diets influenced the number and the severity of the mild cardiac changes observed in growing pigs.

A NEW METHOD FOR THE MEASUREMENT OF LIPOPROTEIN LIPASE IN POSTHEPARIN PLASMA USING SODIUM DODECYL SULFATE FOR THE INACTIVATION OF HEPATIC TRIGLYCERIDE LIPASE. M.L. Baginsky and W.V. Brown (Dept. of Med., Schl. of Med., Univ. of California, San Diego, La Jolla, CA) *J. Lipid Res.* 20, 548–56 (1979). Lipoprotein lipase (LPL) and hepatic triglyceride lipase (H-TGL) are lipolytic activities found in postheparin plasma. A simple and precise method for the direct determination of LPL in postheparin plasma is described. Preincubation of this plasma (45–60 min at 26°C) with sodium dodecyl sulfate (35–50 mM) in 0.2 M Tris-HCl buffer, pH 8.2, results in the inactivation of H-TGL, while leaving LPL fully active.

STRUCTURAL ORGANIZATION OF FREE AND ESTERIFIED CHOLESTEROL IN HUMAN HIGH DENSITY LIPOPROTEINS. A 100.6 MHz ^{13}C NMR STUDY. H. Hauser and G.M. Kostner (Eidgenossische Technische Hochschule Zurich, Lab. fur Biochemie, ETH-Zentrum, Universitatstrasse 16, CH-8092 Zurich, Switzerland) *Biochim. Biophys. Acta* 573, 375–81 (1979). The structural organization of free and esterified cholesterol in human high density lipoproteins has been studied by high-field ^{1}H and ^{13}C NMR. The measurements are consistent with free cholesterol being present in at least two different environments. Part of the free cholesterol is oriented in the outer surface layer of the high density lipoprotein particle in contact with phospholipid or apoprotein, or both. The rest is probably present in the liquid, hydrophobic core of the HDL particle.

SPHINGOMYELIN-LECITHIN BILAYERS AND THEIR INTERACTION WITH CHOLESTEROL. W.I. Calhoun and G.G. Shipley (Biophys. Div., Dept. of Med., Boston Univ. Schl. of Med., Boston, MA) *Biochemistry* 18, 1717–22 (1979). Utilizing X-ray diffraction and differential scanning calorimetry (DSC), we have studied (1) the structure and thermotropic properties of hydrated *N*-palmitoylsphingomyelin, (2) the interaction of *N*-palmitoylsphingomyelin with dimyristoyllecithin, and (3) the interaction of cholesterol with *N*-palmitoylsphingomyelin and dimyristoyllecithin, both individually and in a 50:50 (mol/mol) mixture. Scanning calorimetry indicates that interaction with cholesterol is similar for both *N*-palmitoylsphingomyelin and dimyristoyllecithin and that in a 50:50 (mol/mol) mixture cholesterol shows no preferential affinity for either phospholipid.

DIETARY FAT-DEPENDENT CHANGES IN HEPATIC CHOLESTEROGENESIS AND THE ACTIVITY OF 3-HYDROXY-3-METHYLGLUTARYL-CoA REDUCTASE IN FASTED-REFED RATS. T. Ide, T. Tanaka and M. Sugano (Lab. of Nutr. Chem., Dept. of Food Sci. and Tech., Kyushu Univ. Schl. of Agr., Fukuoka 812, Japan) *J. Nutr.* 109, 807–18 (1979). Effects of various dietary fats on the activity of 3-hydroxy-3-methylglutaryl-CoA (HMG-CoA) reductase and sterol and fatty acid synthesis from [1-^{14}C]acetate and [2-^{14}C]-mevalonate were examined in the liver from fasted-refed rats. Rats fasted for 2 days were refed a fat-free diet or diets containing various fats (tricaprylin, trilaurin, trimyristin, tristearin, camellia oil, or safflower oil) at 10% level for 1, 3, or 7 days. Dietary fats appear to play an important role not only in the regulation of hepatic HMG-CoA reductase and sterol synthesis, but also in the overall processes of cholesterol dynamics.

EFFECTS OF QUANTITY AND UNSATURATION OF DIETARY FAT ON SERUM COMPONENTS IN NORMAL AND DIABETIC MACACA NIGRA. C.F. Howard, Jr. (Dept. of Nutr. and Metabolic Diseases, Oregon Reg. Primate Res. Center, Beaverton, OR) *J. Nutr.* 109, 892–903 (1979). Dietary fat affects serum lipids independently of dietary cholesterol. Normal and diabetic monkeys *(Macaca nigra)* were fed cereal-based, specially formulated diets with either a low fat (LF = 2.5%) or a higher fat (13.2%) content; the latter had varying concentrations of safflower and coconut oil to attain greater polyunsaturation (SFO) or saturation (CCO) in the diets. The quantity of fat had a greater effect on serum cholesterol than did the degree of polyunsaturation. In both groups, triglyceride concentrations correlated significantly with VLDL protein, and cholesterol levels correlated with LDL protein. Thus the responses of *Macaca nigra* to dietary fat manipulation depend upon both the diet fat content and composition as well as the normal or diabetic metabolic state of each monkey.

EFFECTS OF VITAMIN E DEFICIENCY ON THE ACTIVITIES OF LIPID-REQUIRING ENZYMES IN RABBIT LIVER AND MUSCLE. C. Vajanamarhutue, P. Wilairat and P. Komaratat (Dept. of Biochem., Faculty of Sci., Mahidol Univ., Rama 6 Rd., Bangkok 4, Thailand) *J. Nutr.* 109, 848–55 (1979). The effects of vitamin E deficiency on membrane integrity were studied by examining the temperature dependence of membrane-bound enzyme activities in liver mitochondria and microsome and in muscle sarcoplasmic reticulum. In vitamin E-deficient rabbits, the specific activities at 37° of mitochondrial oligomycin-sensitive ATPase (EC 3.6.1.3), β-hydroxybutyrate dehydrogenase (EC 1.1.1.30), and microsomal glucose-6-phosphatase (EC 3.1.3.9) were increased, whereas those of microsomal NADH cytochrome C reductase (EC 1.6.99.3) and sarcoplasmic reticulum Ca-ATPase were reduced in comparison to control rabbits.

EFFECTS OF DIETARY VITAMIN A DEFICIENCY, RETINOIC ACID AND PROTEIN QUANTITY AND QUALITY ON SERIALLY OBTAINED PLASMA AND LIVER LEVELS OF VITAMIN A IN RATS. B.A. Underwood, J.D. Loerch and K.C. Lewis (Nutr. Program, Div. of Biol. Health, Pennsylvania State Univ., University Park, Penn.) *J. Nutr.* 109, 796–806 (1979). Rats were fed vitamin A-deficient diets either alone, supplemented with retinoic acid (RA), or of limited protein quality or quantity (7% rice or 7% casein protein); one group was fed 7% rice protein supplemented with vitamin A. Supplementation with RA caused an immediate and sustained reduction of 15 to 20 μg/dl in circulating vitamin A. A scheme is proposed suggesting possible regulatory mechanisms that might control homeostatic levels of plasma vitamin A.

EFFECTS OF RETINOIC ACID ON THE MOBILIZATION OF VITAMIN A FROM THE LIVER IN RATS. B. Keilson, B.A. Underwood and J.D. Loerch (Nutr. Program, Div. of Biol. Health, Pennsylvania State Univ., University Park, Penn.) *J. Nutr.* 109, 787–95 (1979). The effect of short- (3 days) and long-term (24 or 25 days) feeding of retinoic acid (RA) on plasma levels of retinal and on the ability of the hepatic system to mobilize retinol was studied in three groups of normally

growing rats maintained on vitamin A-deficient diets. The data suggest that direct partial provision of tissue needs for vitamin A by RA modified the feedback control mechanism that, in the absence of dietary RA, regulates mobilization and/or release of retinol bound to its carrier protein from endogenous stores.

RESPONSE OF PLASMA LEVELS OF VITAMIN A TO A DOSE OF VITAMIN A AS AN INDICATOR OF HEPATIC VITAMIN A RESERVES IN RATS. J.D. Loerch, B.A. Underwood and K.C. Lewis (Nutr. Program, Div. of Biol. Health, Pennsylvania State Univ., University Park, Pennsylvania) *J. Nutr.* 109, 778–86 (1979). Rats were fed diets deficient [−A] or sufficient [+A] (3 mg retinol equivalents/kg) in vitamin A, and without [−RA] or with [+RA] (12 mg/kg) retinoic acid supplementation, for up to 33 days. An RDR above 50% invariably was associated with low plasma levels (10 to 30 μg/dl) and low liver stores (<10 μg/g) of vitamin A, whereas an RDR of less than 40% was associated with plasma levels above 30 μg/dl and liver stores ranging from 3 to 100 μg/g.

METABOLISM OF 3α,7α-DIHYDROXY-5β-CHOLESTANOIC ACID BY RAT LIVER IN VIVO AND IN VITRO. J. Gustafsson (Dept. of Chem., Karolinska Inst., Stockholm, Sweden) *J. Lipid Res.* 20, 265–70 (1979). The metabolism of 3α,7α-dihydroxy-5β-cholestanoic acid was studied in bile fistula rats and in preparations from rat liver homogenates. In the bile fistula rat, the main products were chenodeoxycholic acid, α-muricholic acid, and β-muricholic acid. Only small amounts of cholic acid were formed. Incubations of 3α,7α-dihydroxy-5β-cholestanoic acid with microsomes and NADPH yielded as the main products 3α,6β,7α-trihydroxy-5β-cholestanoic acid.

EFFECT OF DIOSGENIN ON LIPID METABOLISM IN RATS. M.N. Cayen and D. Dvornik (Dept. of Biochem., Ayerst Res. Lab., Montreal, Quebec H3C 3JI, Canada) *J. Lipid Res.* 20, 162–74 (1979). The purpose of this study was to determine whether diosgenin suppresses cholesterol and bile acid metabolism. Diosgenin fed with the diet for 1 week inhibited cholesterol absorption as determined by the serum isotope ratio technique, as well as by measuring in the feces the amount of unabsorbed radioactivity from orally administered [^{3}H]cholesterol. It was concluded that diosgenin interferes with the absorption of cholesterol of both exogenous and endogenous origin; such interference is accompanied by derepressed, i.e., increased, rates of hepatic and intestinal cholesterol synthesis. The increased unabsorbed cholesterol together with enhanced secretion of cholesterol into bile resulted in increased excretion of neutral sterols without affecting the biliary and fecal excretion of bile acids.

STIMULATION OF CHOLESTEROL ESTERIFICATION IN HEPATIC MICROSOMES BY LIPOPROTEINS FROM NORMAL AND HYPERCHOLESTEROLEMIC RABBIT SERUM. S. Hashimoto and S. Dayton (Res. Service and Med. Service. VA Wadsworth Hosp. Center, Los Angeles, CA) *Biochim. Biophys. Acta* 573, 354–60 (1979). Incubation of plasma lipoproteins with rabbit hepatic microsomes enriched the microsomes with free cholesterol and stimulated cholesterol esterification. The rate of cholesterol esterification correlated well ($r = 0.96$) with the concentration of microsomal free cholesterol. Lipoproteins from normal and hypercholesterolemic serum varied in their propensity to stimulate cholesterol esterification. The augmentation of cholesterol content, when microsomes were exposed to mixed hyperlipidemic lipoproteins, was proportionately much greater than augmentation of phospholipid or protein concentration.

PURIFIED PHOSPHOLIPASE A_2 FROM SHEEP ERYTHROCYTE MEMBRANE. PREFERENTIAL HYDROLYSIS ACCORDING TO POLAR GROUPS AND 2-ACYL CHAINS. J. Jimeno-Abendano and P. Zahler (Inst. of Biochem., Univ. of Berne, Freiestrasse 3, Berne, Switzerland) *Biochim. Biophys. Acta* 573, 266–75 (1979). Hydrolysis of natural phospholipids by pure erythrocyte membrane phospholipase A_2 was compared to the reaction catalyzed by the soluble pancreatic enzyme. Fatty acids liberated during both types of reaction were quantitatively analyzed by gas liquid chromatography. We confirm for the pancreatic enzyme lack of specificity with respect to the *sn*-2 acyl chain of the phospholipids and preference for negatively charged polar head groups. The significance of such differences between pancreatic and sheep erythrocyte enzyme is discussed in relation to the possible physiological role of the latter enzyme.

CONTINUOUS MONITORING OF FREE FATTY ACID RELEASE FROM ADIPOCYTES BY pH-STAT TITRATION. N.O. Nilsson and P. Belfrage (Dept. of Physiol. Chem. 4, Univ. of Lund, P.O.B. 750, S-220 07 Lund, Sweden) *J. Lipid Res.* 20, 557–60 (1979). A method for direct and continuous monitoring of free fatty acid release in adipocyte suspensions is described. Using a pH-stat apparatus the protons from the released free fatty acids are continuously titrated and the accumulated amount of OH^- added is monitored on a recorder against time, the slope thus indicating the rate of free fatty acid release. Under the conditions described, free fatty acid release from 5% of maximal norepinephrine stimulation of rat adipocytes can be accurately measured and the kinetics can be followed over extended periods of time.

MODIFICATION OF THE FATTY ACID COMPOSITION OF CULTURED HUMAN FIBROBLASTS. A.A. Spector, R.E. Kiser, G.M. Denning, S.-W.M. Koh and L.E. DeBault (Dept. of Biochem., Univ. of Iowa, Iowa City, IA) *J. Lipid Res.* 20, 536–47 (1979). The fatty acid composition of human skin fibroblasts grown in 10% dialyzed fetal calf serum can be modified considerably by adding supplemental fatty acids to the culture medium. The degree of modification was dependent on the concentration of added fatty acid over the range tested, 2.5×10^{-5} to 1×10^{-4}. Fatty acid modifications also were produced in the commercially available IMR-90 strain of human lung fibroblasts, suggesting that the ability to tolerate considerable differences in fatty acid composition is not a special property of the skin fibroblast line that was isolated locally.

PURIFICATION OF PHOSPHOLIPASE C FROM BACILLUS CEREUS BY HYDROPHOBIC CHROMATOGRAPHY ON PALMITOYL CELLULOSE. S. Imamura and Y. Horiuti (Res. Lab., Toyo Jozo Co., Ltd., Mifuku, Ohito-cho, Tagata-gun, Shizuoka 410–23, Japan) *J. Lipid Res.* 20, 519–24 (1979). Phospholipase C (phosphatidylcholine choline-phosphohydrolase, EC 3.1.4.3) from Bacillus cereus (IAM-1208) was absorbed to palmitoyl cellulose from a crude enzyme solution at pH 5–9. The enzyme adsorbed on palmitoyl cellulose was active, although its activity was about one-fourth that of free phospholipase C. Therefore, the enzyme appeared to be adsorbed to the cellulose through a hydrophobic site that was distinct from the catalytic site on the enzyme molecule.

METABOLISM OF 5β-CHOLESTANE-3α,7α,12α,26-TETROL AND 5β-CHOLESTANE-3α,7α,12α,25-TETROL INTO CHOLIC ACID IN NORMAL HUMAN SUBJECTS. R.F. Hanson, A.B. Staples, and G.C. Williams (Dept. of Internal Med., Univ. of Minnesota Med. Schl., Minneapolis, MN) *J. Lipid Res.* 20, 489–93 (1979). Side chain oxidation and cleavage of precursors in cholic acid synthesis is thought to involve initial hydroxylation at either position 25 or 26 of the side chain. Therefore, the conversion of 5β-cholestane-3α,7α,12α,26-tetrol and 5β-cholestane-3α,7α,12α,25-tetrol into cholic acid was studied in normal subjects after single intravenous injections of these labeled alcohols. Thus, this study indicates that 5β-cholestane-3α,7α,12α,25-tetrol is an inefficient substrate for cholic acid biosynthesis in man and that the major route of cholic acid synthesis probably involves the 26-hydroxylated intermediate.

LIPID METABOLISM IN CULTURED CELLS. XVIII. COMPARATIVE UPTAKE OF LOW DENSITY AND HIGH DENSITY LIPOPROTEINS BY NORMAL, HYPERCHOLESTEROLEMIC AND TUMOR VIRUS-TRANSFORMED HUMAN FIBROBLASTS. J.-D. Wu, J. Butler and J.M. Bailey (Dept. of Biochem., The George Washington Univ. Schl. of Med., Washington, DC) *J. Lipid Res.* 20, 472–80 (1979). Serum lipoproteins control cell cholesterol content by regulating its uptake, biosynthesis, and excretion. Monolayers of cultured fibroblasts were used to study interactions with human high density (HDL) and low density (LDL) lipoproteins doubly labeled with [^{3}H]cholesterol and ^{125}I in the apoprotein moiety. These results indicate that HDL and LDL bind to cultured cells at separate sites and that further processing of the two lipoprotein classes appears to take place by fundamentally different mechanisms.

LIPOPROTEIN LIPASE AND ACID LIPASE ACTIVITY IN RABBIT BRAIN MICROVESSELS. P. Brecher and H.-T. Kuan (Dept. of Med., Boston Univ. Med. Center, Boston, MA) *J. Lipid Res.* 20, 464–71 (1979). A preparation of cerebral microvessels was used to demonstrate the presence of lipoprotein lipase and acid lipase activity in the microvasculature of rabbit brain. Microvessels, consisting predominantly of capillaries, small arterioles, and venules, were isolated from rabbit brain. Homogenates were assayed for lipolytic activity using a glycerol-stabilized trioleoylglycerol-phospholipid emulsion as substrate. The data show the presence of both lipoprotein lipase and acid lipase in brain microvessels and suggest that lipoproteins

are metabolized within the cerebral vasculature.

THE SUBCELLULAR LOCALIZATION OF NEUTRAL SPHINGOMYELINASE IN RAT LIVER. K.Y. Hostetler and P.J. Yazaki (Dept. of Med., Div. of Metabolic Disease, Univ. of California, San Diego, CA) *J. Lipid Res.* 20, 456–63 (1979). The subcellular distribution of neutral sphingomyelinase activity has been determined in rat liver. Neutral sphingomyelinase is present in the plasma membrane. This enzyme requires either Mg^{2+} or Mn^{2+} for full activity; these cations cannot be replaced by Co^{2+} or Ca^{2+}. The plasma membrane sphingomyelinase is strongly inhibited by Hg^{2+}. In contrast to the results obtained with the neutral sphingomyelinase activity of plasma membranes and microsomes, lysosomal sphingomyelinase is unaffected by sulhydryl inhibitors.

CHANGES IN THE CONCENTRATION OF PLASMA LIPOPROTEINS AND APOPROTEINS FOLLOWING THE ADMINISTRATION OF TRITON WR 1339 TO RATS. T. Ishikawa and N. Fidge (Cardiovascular Metabolism and Nutr. Res. Unit, Baker Med. Res. Inst., Prahan, Victoria, Australia) *J. Lipid Res.* 20, 254–64 (1979). Changes in whole plasma and lipoprotein apoprotein concentrations were determined after a single injection of Triton WR 1339 into rats. Concentrations of apoproteins A-I (an activator of lecithin:cholesterol acyl transferase), arginine-rich apoprotein (ARP), and B apoprotein were measured by electroimmunoassay. These studies suggest that the detergent may achieve its hyperlipidemic effect by disrupting HDL and thus removing and A-I and C-II proteins from a normal activating environment comprising VLDL, HDL, and the enzymes. The possible involvement of intact HDL in VLDL catabolism is discussed in relation to other recent reports which also suggest that abnormalities of the VLDL-LDL system may be due to the absence of normal HDL.

ONTOGENY OF GLYCEROLIPID BIOSYNTHETIC ENZYMES IN SWINE LIVER AND ADIPOSE TISSUE. D.G. Steffen, G. Phinney, L.J. Brown and H.J. Mersmann (Shell Devl. Co., Modesto, CA) *J. Lipid Res.* 20, 246–53 (1979). Enzymes associated with glycerolipid biosynthesis were examined in microsomal fractions of liver and adipose tissue obtained from swine of various ages. Generally, liver glycerophosphate acyltransferase, phosphatidate phosphohydrolase, diglyceride acyltransferase, and choline phosphotransferase activities were substantial at birth but increased 2- to 3-fold by day 14 postpartum, decreased at day 25, then increased at the oldest ages studied (up to 155 days postpartum). In adipose tissue, enzyme activities were low at birth and developed through day 25 in a pattern generally similar to that observed in liver.

ENZYME-LINKED IMMUNOASSAY OF URSODEOXYCHOLIC ACID IN SERUM. S. Ozaki, A. Tashiro, I. Makino, S. Nakagawa and I. Yoshizawa (Second Dept. of Med., Hokkaido Univ. Schl. of Med., Sapporo, Japan) *J. Lipid Res.* 20, 240–5 (1979). A sensitive and specific enzyme-linked immunoassay for the measurement of ursodeoxycholic acid in human serum was developed. Ursodeoxycholic acid conjugated to alkaline phosphatase (from calf intestine) was used as a tracer. The specificity and sensitivity of this enzyme-linked immunoassay were similar to those of a radioimmunoassay reported previously. The serum ursodeoxycholic acid levels measured by this method correlated well with those determined by gas-liquid chromatography and radioimmunoassay. Based on these findings, this enzyme-linked immunoassay of bile acid might be useful as a tool for the routine clinical analysis of serum bile acids.

THE STEREOCHEMICAL CONFIGURATION OF LYSOSOMAL PHOSPHATIDYLCHOLINE AND PHOSPHATIDYLETHANOLAMINE: COMPARISON OF LYSOBISPHOSPHATIDIC ACID. A. Joutti and O. Renkonen (Lab. of Lipid Res., Univ. of Helsinki, Haartmaninkatu 3, SF 00290 Helsinki 29, Finland) *J. Lipid Res.* 20, 230–3 (1979). Lysosomal phosphatidylcholine and phosphatidylethanolamine were isolated from liver of rats treated with Triton WR 1339 and from cultured BHK-cells. Stereochemical analysis proved that these lipids, in contrast to the lysosomal lysobisphosphatidic acid, were derivatives of *sn*-glycero-3-phosphate.

CHANGES IN PLASMA VERY LOW DENSITY AND LOW DENSITY LIPOPROTEIN CONTENT, COMPOSITION, AND SIZE AFTER A FATTY MEAL IN NORMO- AND HYPERTRIGLYCERIDEMIC MAN. T.G. Redgrave and L.A. Carlson (King Gustav V Res. Inst., Karolinska Hosp., Stockholm, Sweden) *J. Lipid Res.* 20, 217–29 (1979). Four subfractions of plasma VLDL characterized by decreasing S_f value and LDL were isolated by density gradient preparative ultracentrifugation from normotriglyceridemic (NTG) and hypertriglyceridemic (HTG) (type IV) subjects in the fasting state and after a fatty meal. The LDL of type IV subjects contained more apoprotein B than those from NTG subjects, and this difference was associated with increases in diameter, molecular weight, density, and the ratio of protein: phospholipid in LDL from type IV subjects. Defective degradation of large VLDL to small VLDL, and of VLDL to LDL may be related to this alteration in apoprotein B content of the lipoproteins in type IV subjects.

INHIBITION OF EPINEPHRINE-INDUCED LIPOLYSIS IN ISOLATED WHITE ADIPOCYTES OF AGING RABBITS BY INCREASED ALPHA-ADRENERGIC RESPONSIVENESS. M. Lafontan (Inst. de Physiologie, Universite Paul Sabatier, ERA CNRS 412-2- rue Francois Magendie, 31400 Toulouse, France) *J. Lipid Res.* 20, 208–16 (1979). The aim of this study was to explain the unresponsiveness of rabbit perirenal adipose tissue to epinephrine. The in vitro lipolytic response to isoproterenol and to epinephrine alone or associated with alpha- or beta-adrenergic blocking agents, was studied in the adipocytes of rabbits of various ages. The loss of beta-adrenergic responsiveness towards epinephrine in the aging rabbit is linked to the involvement of an increased alpha-adrenergic responsiveness. The stimulation of alpha receptor sites by epinephrine

leads to a depressive effect on lipolysis (lack of adipokinetic effect or antilipolytic action).

DISTRIBUTION OF CHOLESTEROL AND APOLIPOPROTEIN A-I AND A-II IN HUMAN HIGH DENSITY LIPOPROTEIN SUBFRACTIONS SEPARATED BY CsCl EQUILIBRIUM GRADIENT CENTRIFUGATION: EVIDENCE FOR HDL SUBPOPULATIONS WITH DIFFERING A-I/A-II MOLAR RATIOS. M.C. Cheung and J.J. Albers (Northwest Lipid Res. Clin., Harborview Med. Center, 325 Ninth Ave, Seattle, WA) *J. Lipid Res.* 20, 200–7 (1979). The purpose of this experiment was to characterize the high density lipoproteins (HDL) as a function of hydrated density. HDL was subfractionated on the basis of hydrated density by CsCl density gradient centrifugation of whole serum or the d 1.063–1.25 g/ml HDL fraction isolated from three men and three women. HDL subfractions with the same hydrated densities had comparable molecular weights and A-I/A-II and cholesterol/(A-I + A-II) ratios when isolated from men or women. HDL contains subpopulations that differ in the A-I/A-II molar ratio.

NORETHINDRONE ACETATE INHIBITION OF SPLANCHNIC TRIGLYCERIDE SECRETION IN CONSCIOUS GLUCOSE-FED SWINE. B.M. Wolfe and D.M. Grace (Univ. Hosp., Univ. of Western Ontario, London, Ontario, Canada) *J. Lipid Res.* 20, 175–82 (1979). The effects of conventional doses of two synthetic contraceptive steroids on the concentration and rate of secretion of plasma triglycerides from the splanchnic region were investigated. Compared with studies in the untreated animal, norethindrone acetate significantly reduced the arterial concentration (1.1 ± 0.1 vs. 0.7 ± 0.1 mM) and rate of splanchnic secretion of plasma triglyceride fatty acids (2.0 ± 0.4 vs. 0.8 ± 0.1 mol/min · kg body $wt^{0.75}$) and decreased the percent of free fatty acids entering the splanchnic region that was converted to plasma triglycerides (22 ± 5 vs. $13 \pm 3\%$, $P < 0.05$). Ethynylestradiol, in the dose employed, had no significant effect on these variables; however, ethynylestradiol and norethindrone acetate together gave responses similar to norethindrone acetate alone.

ESSENTIAL FATTY ACID DEFICIENCY AND ADRENAL CORTICAL FUNCTION IN VITRO. G.V. Vahouny, V.A. Hodges and C.R. Treadwell (Dept. of Biochem., Schl. of Med. and Health Sci., The George Washington Univ., Washington, D.C.) *J. Lipid Res.* 20, 154–61 (1979). Adrenocortical cells were prepared from rats maintained on essential fatty acid-deficient diets and control litter mates. Cells from control rats had high concentrations of essential fatty acids in the cholesteryl ester fraction of which approximately 22% was arachidonate. In contrast, cells from EFA-deficient rats had only 2.5% arachidonate in the cholesteryl esters, even though the total esterified cholesterol level was comparable to that of controls. The results indicate that high levels of the prostaglandin precursors, namely linoleate and arachidonate, are not a sine qua non for the steroidogenic action of ACTH or cyclic AMP.

HEPATIC LIPID METABOLISM IN DOMESTIC FOWL AS INFLUENCED BY DIETARY CEREAL. D.V. Maurice and L.S. Jensen (Dept. of Poultry Sci., Univ. of Georgia, Athens, GA) *J. Nutr.* 109, 872–82 (1979). The influence of dietary cereal on hepatic lipid metabolism was studied in adult Japanese quail and mature female chickens fed isoenergetic and isonitrogenous corn-soy and wheat-soy diets ad libitum. Hepatic lipid accumulation and rate of biosynthesis were significantly higher in birds fed the corn-soy diet. The differential response to the cereals was seen in ovipositing females but not in mature male quail. These studies show that differences in liver lipid accumulation due to corn and wheat diets are related to changes in rate of lipogenesis.

THE EFFECT OF CERULENIN AND EXOGENOUS FATTY ACIDS ON TRIACYLGLYCEROL ACCUMULATION IN AN INOSITOL-DEFICIENT YEAST, SACCHAROMYCES CARLSBERGENSIS. G. Daum, G. Gamerith and F. Paltauf (Inst. fur Biochemie, Technische Universitat Graz, A-8020 Graz, Austria) *Biochim. Biophys. Acta* 573, 413–5 (1979). Cerulenin inhibits fatty acid synthesis in yeast; supplementation with exogenous fatty acids is required to maintain cell growth. In the presence of cerulenin and exogenous fatty acids inositol-deficient cells accumulate triacylglycerols to almost the same extent as normally grown deficient cells, indicating that increased fatty acid synthesis is not primarily responsible for triacylglycerol accumulation.

TRANSFORMATION OF ARACHIDONIC ACID INTO 12-HYDROXY-5,8,10,14-EICOSATETRAENOIC ACID BY MOUSE PERITONEAL MACROPHAGES. M. Rigaud, J. Durand and J.C. Breton (Lab. de Biochimie, Faculte de Medecine, 2 rue du Docteur Marcland, 87300 Limoges Cedex, France) *Biochim. Biophys. Acta* 573, 408–12 (1979). Mouse peritoneal macrophages were incubated at 37°C for 30 min with arachidonic acid (all-*cis*-5,8,11,14-eicosatetraenoic acid). Oxygenation of arachidonic acid in mouse peritoneal macrophages occurs by two major pathways: fatty acid cyclooxygenase and lipoxygenase. The major metabolite of the latter is 12-hydroxy-5,8,10,14-eicosatetraenoic acid which was identified by gas liquid chromatography on high resolution glass capillary column and mass spectrometry.

IN VIVO TRANSFER OF CHOLESTERYL ESTERS FROM HIGH DENSITY LIPOPROTEINS TO VERY LOW DENSITY LIPOPROTEINS IN MAN. P.J. Nestel, M. Reardon and T. Billington (Cardiovascular Met. and Nutr. Res. Unit, Baker Med. Res. Inst., Melbourne, Australia) *Biochim. Biophys. Acta* 573, 403–7 (1979). The fate of cholesteryl esters in high density lipoprotein (HDL) was studied to determine whether the transfer of esterified cholesterol from HDL to other plasma lipoproteins occurred to a significant extent in man. HDL cholesteryl ester, labelled in vitro with [^{3}H]cholesterol, was injected into human subjects. The rapid rate of labelling of VLDL from HDL suggests that the transfer of HDL cholesteryl esters to VLDL may represent a significant pathway for the disposal of HDL cholesterol.

STIMULATION OF PHOSPHATIDIC ACID PRODUCTION IN PLATELETS PRECEDES THE FORMATION OF ARACHIDONATE AND PARALLELS THE RELEASE OF SEROTONIN. E.G. Lapetina and P. Cuatrecasas (Dept. of Molecular Biol., Wellcome Res. Lab., 3030 Cornwallis Rd., Res. Triangle Park, NC) *Biochim. Biophys. Acta* 573, 394–402 (1979). Thrombin rapidly induces the formation of labeled phosphatidic acid from platelets prelabeled with [^{14}C] arachidonate or $^{32}PO_4^{3-}$ and specifically decreases by 50–75% the content of phosphatidylinositol. Phosphatidate production reflects the generation of diacylglycerol by C-type phospholipase degradation of phosphatidylinositol. Diacylglycerol and phosphatidic acid may participate in the membrane modification related to the early changes in platelet shape, release reactions or aggregation which occur on stimulation.

CHARACTERIZATION OF LOW DENSITY LIPOPROTEIN-LIKE PARTICLE IN THE HUMAN AORTA FROM GROSSLY NORMAL AND ATHEROSCLEROTIC REGIONS. H.F. Hoff, W.A. Bradley, C.L. Heideman, J.W. Gaubatz, M.D. Karagas and A.M. Gotto, Jr. (Dept. of Med., Baylor College of Med., Houston, TX) *Biochim. Biophys. Acta* 573, 361–74 (1979). Physical and chemical criteria of lipoproteins containing apolipoprotein B, extracted from human aortic intima, were compared with those of plasma low density lipoproteins (LDL). Homogenates of grossly normal intima and advanced atherosclerotic lesions were subjected to differential ultracentrifugation to isolate a $d = 1.006$–1.063 g/ml density fraction which was extensively characterized. Our initial studies suggest that although aortic fractions are similar to LDL by certain criteria, some differences observed are more pronounced infractions from lesions than from normal intima.

REGULATION OF BODY CHOLESTEROL POOLS. INFLUENCE OF CHOLESTEROL INPUT AND EXCRETION IN AN ANIMAL MODEL. S. Robins and A. Russo (Dept. of Med., Veterans Admin. Hosp. Boston, MA) *Biochim. Biophys. Acta* 573, 343–53 (1979). Biliary cholesterol excretion closely parallels lecithin excretion in the rat and may be increased by feeding an excess of choline and decreased by choline deficiency. To determine the relative influence of cholesterol input and excretion on whole body cholesterol metabolism, we have measured by compartmental analysis rates of cholesterol transport and pool sizes when both input and choline-mediated biliary excretion were increased and diminished. Thus, in this model, cholesterol excretion and tissue deposition were reciprocally related, and, regardless of plasma cholesterol concentration and cholesterol input, stores were found to increase only when biliary excretion was impaired.

STRUCTURE OF MEMBRANE LIPIDS AND PHYSICO-BIOCHEMICAL PROPERTIES OF THE PLASMA MEMBRANE FROM THERMOPLASMA ACIDOPHILUM, ADAPTED TO GROWTH AT 37°C. L.L. Yang and A. Haug (MSU-DOE Plant Res. Lab., Michigan State Univ., East Lansing, MI) *Biochim. Biophys. Acta* 573, 308–20 (1979). *Thermoplasma acidophilum*, a mycoplasma-like organism, grows optimally at 56°C and pH 2. The low temperature extreme of growth is 37°C. The plasma membrane of cells grown at 37°C was isolated and characterized physico-

biochemically. The lipid structures were elucidated by combined gas chromatography-mass spectroscopy, direct probe mass spectroscopy and ^{13}C NMR. There is a close correlation between membrane fluidity and physiological functioning of this membrane-bound enzyme.

VALIDATION OF A PROCEDURE FOR EXOGENOUS ISOTOPIC LABELING OF LIPOPROTEIN TRIGLYCERIDE WITH RADIOACTIVE TRIOLEIN. C.J. Fielding (Cardiovascular Res. Inst., Univ. of California Med. Center, San Francisco, CA) *Biochim. Biophys. Acta* 573, 255–65 (1979). A procedure has been developed for the exogenous isotopic labeling of triglyceride-rich lipoproteins (chylomicrons and very low density lipoproteins) using high specific activity radioactive triglyceride in the presence of aqueous dimethyl sulfoxide. The labeled product lipoproteins showed unchanged chemical and physical properties. Using such labeled lipoproteins it has been shown that uptake of remnant lipoprotein cholesteryl ester and triglyceride by the liver is simultaneous. The labeling procedure described should prove suitable for kinetic studies of the disposition of the various lipoprotein non-polar ('core') lipids.

EVIDENCE FOR THE USE OF A POOL OF THE FREE ARACHIDONIC ACID IN RAT CEREBRAL CORTEX TISSUE FOR PROSTAGLANDIN $F_{2\alpha}$ SYNTHESIS IN VITRO. J. Marion, H.M. Pappius and L.S. Wolfe (Donner Lab. of Exp. Neurochem., Montreal Neurological Inst., McGill Univ., 3801 Univ. St., Montreal, Quebec H3A 2B4, Canada) *Biochim. Biophys. Acta* 573, 229–37 (1979). To determine if the arachidonic acid which is released postmortem in rat cerebral cortex is directly available for the in vitro synthesis of prostaglandin $F_{2\alpha}$, cerebral cortex slices or homogenates were incubated in the presence of [$^2H_8$] arachidonic acid. The deuterium to protium ratios in the prostaglandin $F_{2\alpha}$ were compared to those in the free arachidonic acid and other lipids of the tissue after 5 and 60 min of incubation. The results indicate that exogenous and endogenous arachidonic acid do not mix appreciably in the intact slice and that the prostaglandin synthetase is present on the damaged surface as well as the intact interior of the slice.

KINETICS AND MECHANISM OF PHOSPHATIDYLCHOLINE AND CHOLESTEROL EXCHANGE BETWEEN SINGLE BILAYER VESICLES AND BOVINE SERUM HIGH-DENSITY LIPOPROTEIN. A. Jonas and G.T. Maine (Dept. of Biochem., Schl. of Basic Med. Sci., Univ. of Illinois, Urbana, IL) *Biochemistry* 18, 1722–8 (1979). We investigated the exchange of lipids between sonicated, single bilayer vesicles containing egg phosphatidylcholine and cholesterol in a molar ratio of 2:1 and bovine serum high density lipoprotein, free of lecithin:cholesterol acyltransferase activity. Results indicate that there is no net transfer of lipids under our experimental conditions. All of the vesicle cholesterol is exchangeable, with a radiolabel exchange half-life of 1 h 8 min.

1-FLUOROVITAMIN D_3, A VITAMIN D_3 ANALOGUE MORE ACTIVE ON BONE-CALCIUM MOBILIZATION THAN ON INTESTINAL CALCIUM TRANSPORT. J.L. Napoli, M.A. Rivizzani, H.K. Schnoes and H.F. DeLuca (Dept. of Biochem., College of Agr. and Life Sci., Univ. of Wisconsin-Madison, Madison, WI) *Biochemistry* 18, 1641–6 (1979). The chemical synthesis, spectral characterization, and biological activity of 1-fluorovitamin D_3 are described. The title compound was synthesized through direct fluorination of 1α-hydroxyvitamin D_3 3β-acetate and characterized by ultraviolet, nuclear magnetic resonance, and mass spectroscopy. Therefore, relative to vitamin D_3, 1-fluorovitamin D_3 demonstrates at least partial selectivity for mediating calcium metabolism in bone as opposed to mediating calcium metabolism in intestine.

β-OXIDATION OF THE COENZYME A ESTERS OF ELAIDIC, OLEIC, AND STEARIC ACIDS AND THEIR FULL-CYCLE INTERMEDIATES BY RAT HEART MITOCHONDRIA. L.D. Lawson and F.A. Kummerow (Burnsides Res. Lab., Univ. of Illinois, Urbana, IL) *Biochim. Biophys. Acta* 573, 245–54 (1979). β-Oxidation rates for the CoA esters of elaidic, oleic and stearic acids and their full-cycle β-oxidation intermediates and for the carnitine esters of oleic and elaidic acids were compared over a wide range of substrate and albumin concentrations in rat heart mitochondria. It was concluded that the slower oxidation rate of elaidic acid is not due to slower oxidation of any of its full-cycle β-oxidation intermediates, nor to slower activity of fatty acyl-CoA dehydrogenase, nor to outer mitochondrial carnitine acyltransferase. Possible explanations to account for the slower oxidation rate of elaidic acid are discussed.

ABSORBABILITY OF PLANT STEROLS AND THEIR DISTRIBUTION IN RABBIT TISSUES. A.K. Bhattacharyya and L.A. Lopez (Dept. of Path., Louisiana State Univ. Med. Center, New Orleans, LA) *Biochim. Biophys. Acta* 574, 146–53 (1979). Rabbits were fed a low cholesterol diet containing 2% plant sterols for 10 weeks to determine the absorbability of these sterols and their deposition in the tissues. Campesterol was the preponderant sterol in all tissues studied, including the aorta. Sitosterol was found in small amounts in the tissues of the abdominal organs. Stigmasterol was not detected in any tissue studied. Esterified campesterol and sitosterol were detected in trace amounts in most tissues. Campesterol and sitosterol, particularly the former, accumulated in the tissues including the aorta.

• Drying Oils and Paints

WATER-DISPERSIBLE URETHANE POLYESTERAMIDE COATINGS FROM LINSEED OIL. W.J. Schneider and L.E. Gast. *J. Coatings Tech.* 50 No 646, 76–81 (1978). Water-dispersible coatings were prepared from products of the aminolysis reaction of linseed oil and diethanolamine, polybasic acid anhydrides and tolylene diisocyanate by a simpler and more economical method than conventional alkyd processes. Low reaction temperatures and rapid air drying, for most uses, characterise these coatings. They are hard, glossy and exhibit moderate to good chemical and solvent resistance. (World Surface Coatings Abs. No. 444)

RESINS FROM SUNFLOWER SEED OIL MODIFIED WITH RUBBER BASED ON PIPERYLENE. V.A. Bukhareva, Yu. Perevezentsev, L.V. Kosmodem'yanskii and O.P. Radoman. *Lakokras. Mat.*

1978(3), 60–2. A wide range of these resins and paints based on them were synthesised and tested. The rate of drying of the films was shown to be increased by using a structured polymer of divinylbenzene with piperylene and butadiene. It is pointed out that the consumption of natural materials in paints can be reduced by increasing the variety of synthetic oils, using butadiene/piperylene rubber emulsions as modifying solvent oils for synthetic resins. (World Surface Coatings Abs. No. 443)

WATER VAPOUR PERMEABILITY INFLUENCE OF SUBSTRATE: STUDIES ON ALKYD RESIN VARNISHES. M. Charreton. *Bull. du CERIPEC* 49, 51–79 (1978). The presence of a substrate permeable to water vapour, such as cellophane, lowers the value of the permeability coefficient of varnishes of various types to a degree dependent on the degree of film/substrate interaction. Nevertheless, measurements carried out on a substrate are justified, particularly for their convenience. The water vapour permeability of alkyd resin varnish films depends on the nature of the oil, the oil length and above all the film thickness. Permeability increases with oil length, and the lowest value was obtained with a short oil tall oil alkyd. (World Surface Coatings Abs. No. 444)