α-Aminoadipate has been found to accumulate in the latter group of mutants, but in an inverse relationship to the lysine concentration present in both the intracellular amino acid pool and the medium. As growth decreases the quantity of lysine initially added to the medium to support growth, the α-aminoadipate content in the pool rises. Similarly, if mycelium is starved, the lysine pool concentration is reduced, and the α-aminoadipate content rises. These findings show clearly that lysine end-product control decreased the availability of α-aminoadipate and explains the inhibition of penicillin production by lysine.

We are currently working with cell-free systems in an attempt to show whether this effect is enzyme repression or feedback inhibition.

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Phosphoglucose Isomerase Variation in Man

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A staining procedure for the specific detection of the enzyme phosphoglucose isomerase (PGI) after electrophoresis in starch gels was recently described, and inherited variations in the isoenzymes of PGI were reported in the mouse (Carter & Parr, 1967). We now report a similar type of variation in man.

Most human haemolysates, when subjected to electrophoresis in a phosphate buffer system at pH 7·4, or in tris at pH 8·0, gave a single major band migrating cathodically (called for the present the 'PGI-Usual' type). However, a random survey of 1292 patients and students, predominantly English, revealed four variant types of erythrocyte PGI, each showing three major bands but distinguishable from one another in mobility. Two ('PGI-Ducek' and 'PGI-Phillips') occurred in Englishwomen, one ('PGI-Ferguson') in an Englishman, and two examples of another variant ('PGI-Singh') occurred in a male Sikh student and in a Ceylonese woman.

We also subjected to electrophoresis 358 haemolysates from Asian Indians resident in London, of whom 294 were Sikhs. Three of these Sikhs (two females and one male) were found to be of 'PGI-Singh' type, and a single example of yet another triplet variant ('PGI-Rajan') was found in a Malayalee woman from Kerala State in Southern India.

In all five variant triplet patterns one of the major bands (either the most cathodic or the most anodic) was identical in electrophoretic mobility with the single major band of 'PGI-Usual' type. This sort of occurrence of triplet patterns in other situations, e.g. for mouse PGI (Carter & Parr, 1967) and for human phosphogluconate dehydrogenase (Carter, Fildes, Fitch & Parr, 1968) has been taken to indicate that the enzyme is at least dimeric in structure and autosomally linked, and the present evidence points to similar conclusions for human PGI.

The finding that one type of PGI variation occurs in Sikhs, with an incidence of something greater than one per cent, whereas other types of variation were detected in Londoners, and with a lower overall incidence, suggests that PGI variation is dependent on ethnic grouping, and provides another source of data that may be of value in the study of human anthropology.

Very recently, an independent report has appeared on PGI variation in man (Detter *et al.* 1968).

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The Effect of Actinomycin D and Cycloheximide on the Activation by Prolactin of Lipoprotein Lipase in the Mammary Gland

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The activity of the lipoprotein lipase of mammary gland increases markedly just before parturition (McBride & Korn, 1963; Robinson, 1963). The mechanism whereby these changes in enzyme activity are achieved is obviously of interest. The lactogenic hormone prolactin was used to investigate the relationship between lipoprotein lipase activity and lactogenesis.

Pseudopregnancy was induced in oestrus virgin rabbits by a single injection of 50 i.u. of chorionic gonadotrophin. Lactation was initiated by the intraductal injection of 50 μg./duct N.I.H.-P-S6 prolactin (Chadwick, 1962). Mammary tissue was

removed by biopsy at daily intervals and assayed for lipoprotein lipase activity. The preparation of acetone–ether-dried powders and assay conditions were essentially as described by Robinson (1963), except that the triglyceride substrate was an activated coconut oil and the free fatty acids released on incubation were estimated colorimetrically (Vaughan, Berger & Steinberg, 1964).

The sequential course of response to prolactin is characterized by a significant increase in activity on the third day rising to a 300–400% increase on the fourth day. The activity in the absence of exogenous prolactin during this period of pseudopregnancy was low and relatively constant, and the intraductal injection of 0·15M-NaCl had no effect on lipoprotein lipase activity.

Intraductal administration of actinomycin D 4hr. before, simultaneously with, or one or two days after prolactin, prevented any increase in activity. In a second series of experiments actinomycin D given on the third day after prolactin caused abolition of the lipase activity. Parallel experiments with cycloheximide gave results similar to those described for actinomycin D.

In experiments to determine the half-life of this prolactin-activated lipoprotein lipase, and of the system responsible for its biosynthesis, actinomycin D was injected on the fifth day after prolactin stimulation. From the rate of decrease of lipase activity over a 10hr. period the approximate half-life of the system was found to be 4hr.

From similar experiments in which cycloheximide was used to inhibit protein synthesis, the half-life of the enzyme appeared to be less than 1·5hr.

It was tentatively concluded from these results that activation of lipoprotein lipase in the mammary gland of pseudopregnant rabbits requires RNA biosynthesis and the subsequent biosynthesis of enzyme protein.

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Isomers of Glucosaminylphosphatidylglycerol

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Glucosamine derivatives of phosphatidylglycerol have been described in *Pseudomonas ovalis* Chester (Phizackerley, MacDougall & Francis, 1966) and in *Bacillus megaterium* (Op den Kamp, Houtsmuller & van Deenen, 1965). The phosphoglycolipid from *B. megaterium* has been characterized as 1(-1,2-diacyl-*sn*-glycero-3-phosphoryl)-2-*O*-(2-amino-2-deoxy-D-glucopyranosyl)-*sn*-glycerol and this structure has been confirmed by chemical synthesis (Gurr, Bonsen, Op den Kamp & van Deenen, 1968).

We have examined the lipids of *B. megaterium* and find at least three glucosamine-containing lipids. One of these is not a phospholipid but the other two, which differ in their chromatographic behaviour, contain phosphorus, glycerol, fatty acid and glucosamine in the molar proportions 1:2:2:1. In both cases fatty acids are liberated by mild alkaline hydrolysis, and both yield phosphatidylglycerol after deamination with nitrite. However, the glucosaminylglycerols derived from these lipids by partial acid hydrolysis in 2·0N-HCl for 8hr. at 105° differ in their behaviour towards periodate. In one case, 1 mole of periodate/mole of glucosaminylglycerol is rapidly consumed, whereas in the other case, under identical conditions, the consumption of periodate is negligible. This result indicates that in the first case glucosamine is attached to the 3′-position of the glycerol moiety of phosphatidylglycerol, and in the second case the attachment is to the 2′-position. Both lipids have been *N*-acetylated, and after removal of fatty acids by mild alkaline hydrolysis, *N*-acetylglucosamine is quantitatively released by β-*N*-acetylhexosaminidase from calf brain (Frohwein & Gatt, 1967). It is concluded that in both lipids the glycosidic link has the β configuration.

The glucosaminylphosphatidylglycerol from *Pseudomonas ovalis* is a 2′-glucosaminide. The *N*-acetyl derivative of the deacylated lipid is not a substrate for β-*N*-acetylhexosaminidase, but instead *N*-acetylglucosamine is released by a preparation from *Patella vulgata* that contains α-*N*-acetylhexosaminidase (Conchie & Levvy, 1957). It seems probable therefore that in this lipid glucosamine is bound as an α-glycoside.

All three phosphoglycolipids are good substrates for phospholipase A, and all appear to be resistant to phospholipase C from *Clostridium perfringens*, but only the 3′-glucosaminide is rapidly hydrolysed by phospholipase D, yielding phosphatidic acid and glucosaminylglycerol.

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