maintain a steady concentration of about 10mM in the perfusate during the second hour. A 'spike' of [^{14}C]glycerol was injected at the beginning of this period, when necessary.

The mean rate of glycerol utilization (six experiments) was $1.66\mu\text{mol/min per g}$ of liver. There was no sign of the accumulation of glycerol 1-phosphate described by Schimassek (1968); on the contrary, glucose was produced. The mean net rate of accumulation was $0.60\mu\text{mol/min per g}$, which is about twice that reported by Müllhofer, Hesse, Kunzen & Hechtel (1968), and close to the value of $0.48\mu\text{mol/min per g}$ reported by Ross, Hems & Krebs (1967). However, experiments with [^{14}C]glucose showed that there was a distinct turnover of the glucose pool. About 87% of the ^{14}C lost from labelled glycerol was found in glucose, in agreement with Müllhofer *et al.* (1968).

As reported by McCraw, Yarnell & Ashmore (1969), 4mM-octanoate (+ 4% albumin) had no effect on gluconeogenesis from glycerol, but 2mM-palmitate suppressed glucose formation almost completely. Glycerol uptake was only slightly depressed (average $1.45\mu\text{mol/min per g}$), and was considerably larger than one-third of the rate of fatty acid disappearance from the perfusate, suggesting that a switch from gluconeogenesis to triglyceride synthesis was not the complete reason for the failure to synthesize glucose. Substantial quantities of glucose were synthesized from lactate in the presence of palmitate (and glycerol), showing that the anabolic pathway itself is not blocked by the fatty acid.

These results suggest that the long-held view that glycerol carbon supplies a part of the glucose formed by the liver *in vivo* during starvation may need revision.

This work was supported by a grant from the Medical Research Council.

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The Use of Skin Biopsy in the Diagnosis of the Glycogen-Storage Diseases

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The differential diagnosis of the genetically determined glycogen-storage diseases is usually

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achieved by enzymic assays on liver or muscle biopsies. Dancis, Hutzler, Lynfield & Cox (1969) have found that acid maltase (α -1,4-glucan glucosylhydrolase, EC 3.2.1.3) is absent from tissue cultures of skin fibroblasts from a patient with type II glycogen-storage disease (Pompe's disease). We are in the process of examining some of the enzymes of glycogen metabolism in epidermis and here we report the results of acid maltase and phosphorylase (α -1,4-glucan-orthophosphate glucosyltransferase, EC 2.4.1.1) assays on normal skin and skin from two patients with confirmed type II glycogenosis and one with type V glycogenosis (Gruener, McArdle, Ryman & Weller, 1968).

Samples of skin were obtained either from the edge of a surgical incision or by a vacuum blistering technique (Kiistala, 1968). Acid maltase and phosphorylase activities were assayed by modifications of the methods of Hers (1964).

Samples of normal skin contained both acid maltase (0.32 – $0.79\text{nmol/min per mg wet wt. of tissue}$) and phosphorylase (0.33 – $1.7\text{nmol/min per mg wet wt. of tissue}$) activity. Both the patients with type II glycogen-storage disease showed skin phosphorylase activity within the normal range (0.89 and $0.80\text{nmol/min per mg wet wt. of tissue}$) whereas acid maltase activity could not be detected. The patient with type V glycogenosis, which is characterized by a specific lack of muscle phosphorylase activity, showed skin phosphorylase within the normal range ($0.62\text{nmol/min per mg of tissue}$).

These results suggest that examination of enzyme activity in skin biopsies can be used to replace the more hazardous liver and muscle biopsies for the specific diagnosis of type II glycogenosis.

We are grateful to the Medical Research Council for their support.

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Studies on the Structure of Horse Spleen Apoferritin: the Products of Cyanogen Bromide Cleavage

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Apoferritin from horse spleen was prepared from ferritin by the method of Granick & Michaelis (1943) as modified by Crichton (1969b). This protein of molecular weight 460 000 is thought to be made up of 20 identical subunits arranged at the vertices of a pentagonal dodecabedron with a small central space in each pentagonal face (Harrison, 1963; Harrison &