effects (Wessels *et al.*, 1971), although this has been questioned by others (Turner & Carter, 1972; Haslam, 1972). We propose a model in which cytochalasin B induces exocytosis by interference with the contractile microfilaments of polymorphonuclear leucocytes; filaments normally restrict lysosome contact with the plasma membrane, but, when filament function is disturbed by cytochalasin, contact of granules with membrane takes place, and this results in release of lysosomal enzymes.

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The Role of Ketone Bodies in the Metabolism of the Adult Desert Locust

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Bailey *et al.* (1971) demonstrated the occurrence of the ketone bodies acetoacetate and D-3-hydroxybutyrate in the blood of the adult pigeon (*Columba livia*) and haemolymph of the adult desert locust (*Schistocerca gregaria*). In the pigeon the ketone bodies probably play a similar role in metabolism to that in mammalian systems (Bailey & Horne, 1972). The present study was undertaken to try to elucidate the role of ketone bodies in the metabolism of the desert locust.

Acetoacetate and D-3-hydroxybutyrate are found in the haemolymph, fat-body and flight muscle of adult locusts. Acetoacetate is the major ketone body in haemolymph and flight muscle, whereas D-3-hydroxybutyrate often predominates in fat-body. The haemolymph concentration of acetoacetate varies with age (being highest at ages when the fat-body lipid reserves are being broken down), and is increased by flight, starvation and injection of corpus cardiacum extracts but is unaffected by stress or sex difference. Ketone bodies are formed in the fat-body although rates of formation of acetoacetate and D-3-hydroxybutyrate *in vitro* are low. However, the addition of haemolymph from starved insects to

incubation mixtures containing fat-body and potassium palmitate causes a marked stimulation of ketone-body formation. Both [3-¹⁴C]acetoacetate and D-3-hydroxy[3-¹⁴C]butyrate are oxidized by fat-body, flight muscle and testes of adult male locusts, [3-¹⁴C]acetoacetate being much more readily oxidized than D-3-hydroxy[3-¹⁴C]butyrate [only low activities of D-3-hydroxybutyrate dehydrogenase (EC 1.1.1.30) have been found in the tissues]. Flight muscle is tenfold more active than testis or fat-body in oxidizing [3-¹⁴C]acetoacetate. Starvation causes a greatly decreased rate of oxidation of ketone bodies by fat-body and flight muscle, but has no effect on the ability of testis to degrade those compounds. It appears that in the fed insects flight muscle is the major user of ketone bodies, whereas in the starved male locust testis is a major user of these compounds.

The results obtained suggest that ketone bodies are formed in fat-body during mobilization of triglyceride food reserves and are then either oxidized by the fat-body or transported (mainly as acetoacetate) in the haemolymph to the flight muscle and other tissues to serve as a respiratory fuel.

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Measurement of the Specific Radioactivity of Glutamine and Glutamate in Plasma

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Studies on the kinetics of glutamine and glutamate metabolism both *in vivo* and *in vitro* are frequently complicated by the fact that under many conditions simultaneous synthesis and utilization occur. Thus measurement of the specific radioactivity of glutamine and glutamate in plasma and other biological fluids is of value in studies of turnover rates and turnover times of these amino acids, and also for investigation of control factors in their synthesis and degradation. A method is described for the simultaneous measurement of specific radioactivity of both amino acids in plasma and other biological fluids.

Total glutamate is measured enzymically by the method of Bernt & Bergmeyer (1968) and total glutamine by a method based on that of Hoek *et al.* (1969).

For the radioassay of glutamate and glutamine the following procedure is used. First, total [¹⁴C]glutamate and [¹⁴C]glutamine are measured as follows: glutamine is converted into glutamate and ammonia by incubation for 1 h at pH 5.0 with *Escherichia coli*