in chylomicrons remained well below 1% of the total ^{14}C infused.

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The Use of Fatty Acids by Muscle during Exercise

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Muscle tissue may obtain long-chain fatty acids for oxidation from the following sources: (1) plasma lipid transport system: chylomicrons, lipoproteins, free fatty acids; (2) intracellular lipid pools: triglycerides, phospholipids, other (?); (3) local extracellular lipid pools: adipose tissue between muscle fibres. Changes in these different lipid pools during exercise will be reviewed. Quantitative, as well as qualitative, aspects will be covered. Thus in 1965 ten healthy subjects walked 50km. a day for 10 days. Their daily caloric intake was only about 200cal. It can be estimated that they spent around 4500cal./day (3000 for walking and 1500 for basal metabolism) corresponding to 500g. of fatty acids or 700g. of adipose tissue. They lost about 0.75kg./day (Carlson & Fröberg, 1967). The concentration of free fatty acids in the plasma increased to $1.4\mu\text{moles/ml}$. If we assume the fractional turnover rate of free fatty acids to be about 0.33/min. ($t_{1/2}$ about 2min.) the value for the concentration of free fatty acids corresponds to a transport of 500g. of fatty acids from adipose tissue/24hr. These values support the hypothesis that, in the starving state, free fatty acids are the major transported energy substrate.

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COLLOQUIUM ON 'INTERACTIONS OF NUCLEAR MACROMOLECULES'

Conformations of Nucleohistones and Histones

By E. M. BRADBURY. (*Biophysics Laboratory, Department of Physics, College of Technology, Portsmouth*)

Because of the close association of histones with DNA in the cells of higher organisms, it has been suggested that histones are involved in genetic regulation and much effort has been expended in attempting to demonstrate this role. However, histones are a major component of chromosomes and they could be involved in a purely structural role in controlling the conformational changes that chromosomes undergo during mitosis. Unfortunately there is little precise physical information on the molecular structure of chromosomes and their components and the whole process of chromosomal coiling is not understood.

X-ray-diffraction studies of nucleoproteins have

been disappointing because of the lack of detail in the diffraction patterns. However, a feature of the diffraction patterns that is not present in the diffraction patterns of either the DNA or the total isolated histone is a series of low-angle diffraction rings at 110, 55, 35, 27 and 22 Å (Wilkins, Zubay & Wilson, 1959; Luzzati & Nicolaieff, 1959). From the values of these spacings and their partial meridional orientation, Wilkins (1964) suggested that nucleohistone was in the form of a supercoil of 120 Å pitch and 100 Å diameter. Evidence for this coiled form of nucleohistone has been provided by the experiments of Pardon, Wilkins & Richards (1967) in which a stretched nucleohistone fibre was shown to have lost the low-angle diffraction rings characteristic of the superstructure; the rings, however, reappeared on relaxing the fibre and this cycle could be repeated. It is clear from this experiment that there is a folded structure for