4-ethylsulphonylnaphthalene-1-sulphonic acid in its chromatographic behaviour and u.v. spectrum. Metabolic deamination of a sulphonamide does not appear to have been previously recorded.

I thank the British Empire Cancer Campaign (Yorkshire Council) for financial support.

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Distribution and Biological Role of 3-Methylhistidine in Actin and Myosin

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3-Methylhistidine is present in actin from adult and foetal skeletal muscle, whereas it is only found in myosin of skeletal muscle shortly after birth in the rabbit (Johnson, Harris & Perry, 1967; Asatoor & Armstrong, 1967; Trayer, Harris & Perry, 1968).

In extension of these findings, actin from red skeletal and cardiac muscles of the rabbit and from smooth muscle of the cow uterus and from certain invertebrate muscles has been found to give 3-methylhistidine:histidine ratios similar to that (1:7.6) of purified actin from adult rabbit white skeletal muscle. Slight differences in some of the ratios may be due to small amounts of impurities in the actin preparations.

Myosins from red and cardiac muscles had 3-methylhistidine:histidine ratios much lower (from 1:79 to 1:178) than that (1:44) of purified myosin from adult rabbit white skeletal muscle. In the cases of myosin from smooth and invertebrate muscles the 3-methylhistidine:histidine ratios were higher than 1:44, probably due to actin contamination.

In the white skeletal muscle from vitamin E-deficient dystrophic rabbits, the 3-methylhistidine:histidine ratio for myosin was significantly lower (values ranging from 1:70 to 1:149), and the ratio for actin was unchanged.

These and earlier suggestions (Trayer, Harris & Perry, 1968) that, at least in the case of myosin, the 3-methylhistidine residues were probably not directly involved in the biological activities of the molecule, were confirmed by studies on the Methylene Blue-sensitized photo-oxidation of purified rabbit myosin (Stracher & Chan, 1964) and purified rabbit actin (Martonosi & Gouvea, 1961).

After 35 min. of photo-oxidation the adenosine triphosphatase and actin-combining activities of rabbit myosin were not decreased while the content of 3-methylhistidine was reduced to 0.1 mole/mole. Actin polymerization was totally inhibited after 20 min. of photo-oxidation, whereas approximately half of the actin molecules still possessed intact 3-methylhistidine residues. In both proteins, histidine and 3-methylhistidine residues were destroyed at similar rates.

Thus, although 3-methylation of histidine residues in actin and myosin occurs in a wide variety of muscles, it is not essential for the biological activities of these proteins. It is noteworthy that, whereas actin is methylated to a similar extent in all types of muscle, methylation of myosin is greatest in the fastest muscles, less in slower muscles and absent from the foetal type.

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The Immunochemistry of *Shigella flexneri* O-Antigens: a Comparative Analysis of the O-Specific Side-Chain Structures of Serotypes 1a and 2a

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The *Shigella flexneri* lipopolysaccharides are a family of serologically heterogeneous but structurally related polymers, which resemble their *Salmonella* analogues in possessing a common basal structure to which the various O-specific side chains that determine serological behaviour are attached (Simmons, 1966). The molecular configurations of these O-specific side chains, all of which contain D-glucose, N-acetylglucosamine and L-rhamnose bound in sequences that are unique to each serotype, are presently under study to elucidate the stereochemical basis of their serological specificity and cross-reactivity. The structure of serotype 1a lipopolysaccharide has been elucidated by quantitative analysis of neutral oligosaccharides by using borohydride reduction, periodate oxidation, Morgan-Elson and specific enzyme techniques as described