The chemical properties of this polysaccharide support the contention that it is sulphated. Cetyltrimethylammonium bromide precipitates the polysaccharide even after acidification to pH 2 with acetic acid, indicating that the acidic group is still ionized at pH 2. This material is also strongly adsorbed on DEAE-cellulose and requires 1M-salt at pH 6 for elution, providing further evidence for the anionic nature of the polymer.

This report appears to be the first indication of sulphated polysaccharides in bacteria. Such polymers are more typically found in the mucopolysaccharides of higher organisms and seaweeds.

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Peptidoglycan Lytic System associated with Mesosomal Membranes from *Micrococcus lysodeikticus*

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Previous studies (Ellar, 1969; Ellar & Freer, 1969; Ellar *et al.*, 1971) have described the purification and properties of mesosomal membranes from *Micrococcus lysodeikticus* and *Bacillus megaterium* KM. Although mesosomal membranes were seen to differ from plasma membranes in their morphology and chemical composition and in the activities of certain enzymes, pulse-labelling experiments (Ellar *et al.*, 1971) revealed no preferential synthesis of membrane lipid in the mesosome.

Several reports (Rogers, 1970; Ellar *et al.*, 1967) have observed that mesosomes are invariably associated with the growing transverse septum during division of Gram-positive bacteria. Studies with *Streptococcus faecalis*, which showed that peptidoglycan-hydrolysing enzymes are located in the region of the septum and the newly synthesized cell wall (Shockman *et al.*, 1967a), suggested that the mesosome in this region might represent the site for the enzymic remodelling of the peptidoglycan that is thought to occur during division and cell separation (Rogers, 1970). The present report describes a peptidoglycan-hydrolytic enzyme system associated with mesosomal membranes isolated from *M. lysodeikticus*.

Cytoplasmic and mesosomal membranes were isolated and washed five times as described by Ellar &

Freer (1969). Purified *M. lysodeikticus* cell walls used as substrate in the assay of lytic enzyme were prepared from exponentially growing cells by mechanical disruption (Shockman *et al.*, 1967b) and treated with sodium dodecyl sulphate to inactivate any endogenous autolytic activity. Lytic assays were carried out at 23°C with 2ml of the substrate (150 µg/ml) suspended in 50mM-tris-HCl buffer, pH 7.5, or 50mM-sodium phosphate buffer, pH 6.7. Cytoplasmic or mesosomal membrane contained in the same buffer was added and the total volume was adjusted to 3.0ml. The reaction was followed by observing the change in the absorbance at 450nm. One unit of enzyme was defined as the amount giving a decrease of 0.001 E_{450} unit/h (Shockman *et al.*, 1967b). Assays revealed a high content of peptidoglycan-lytic activity associated with mesosomal membranes (15000 units/mg of protein) whereas the plasma membrane showed a 30-fold less specific activity (430 units/mg of protein). Since no lytic activity could be detected in cell cytoplasm, these results indicate a concentration of over 70% of the total lytic activity of the cell in the mesosomal membranes. Preliminary investigation of the properties of the enzyme system including sensitivity to inhibitors and reaction kinetics have been carried out.

The possibility that this lytic activity might represent contaminating residual lysozyme employed in the isolation of membranes and mesosomes was eliminated by control experiments that included the use of ^{125}I -labelled lysozyme and lysozyme-specific antisera. The relationship between cell and nuclear division and this apparent concentration of peptidoglycan-lytic activity in mesosomal membranes will be discussed.

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Endotoxins in a Lipopolysaccharide Preparation and Cell Envelope of *Escherichia coli*

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Certain groupings detectable in some endotoxins by shifts in the spectrum of a dye (Janda, 1971) were investigated in extracellular materials released by