sperm extracts consistently gives two distinct peaks of enzyme activity. One peak is eluted at a position corresponding to a molecular weight of 100 000, whereas the other peak is eluted at the void volume from Sephadex G-150 (mol.wt. > 500 000). No significant change from one peak to the other was observed when either form was re-run separately on Sephadex, even when run in the presence of high salt concentrations (0.75M). No difference in the K_m of fructose or glucose could be detected between the two forms of hexokinase.

Horizontal starch-gel electrophoresis separates hexokinase into three bands. One of these migrates very slowly from the origin and is characteristic of sperm hexokinases. Katzen (1967) discovered this slowly migrating form of hexokinase in testis and epididymal extracts and deduced that it resulted from the sperm in these tissues. Separate electrophoresis of each of the two peaks from gel filtration strongly suggests that this 'sperm-type' hexokinase band on electrophoresis is identical with the higher-molecular-weight enzyme peak from gel filtration. The low mobility of the 'sperm-type' band may well be due to its being a relatively large molecule, retarded by the sieving action of starch gel, rather than to its charge or chemical properties.

This work is supported by a grant from the Pig Industry Development Authority.

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Characteristics of Growth of a *Pseudomonas* Species in Culture Media containing Chlorhexidine

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Pseudomonads are able to grow in media containing many types of bactericide. We have used a strain isolated by Mr R. Hall that will grow aerobically in media containing up to 200 µg. of chlorhexidine/ml. In the absence of bactericide, cultures consisted mainly of motile bacteria that gave smooth colonies on agar; on transfer to media containing chlorhexidine the organisms became non-motile and had rough colonial morphology. When cultures grown in chlorhexidine were transferred to media containing less, or no, chlorhexidine, growth occurred either immediately or after a lag during which viability was roughly

constant, but on transfer to a medium containing more chlorhexidine viability first decreased, then remained constant, then increased. After this growth phase viability again decreased, usually fairly rapidly, and the greatest absorption of bactericide occurred. The ratio of viable cells to the total cell mass was always lower in the presence than in the absence of bactericide. Electron micrographs of sections revealed, amongst apparently normal bacteria, many greatly damaged bacteria; large numbers of empty vesicles of varying size were present; some had the complete bacterial wall structure, some only part of it. The vesicles probably came from deformed cells, some having no cytoplasm and some in which the cytoplasm was replaced by electron-dense granules.

Suspensions of washed bacteria grown in medium containing radioactively labelled nutrients without chlorhexidine release labelled components from their metabolic pool on boiling, on treatment with acids or on addition of chlorhexidine. Similar suspensions prepared from cultures grown in presence of chlorhexidine have a metabolic pool extractable by boiling or treatment with acids but only partly extractable or not extractable by chlorhexidine depending on the concentration during growth.

At pH 7 cultures in media containing chlorhexidine moved with an electrophoretic mobility of either 1.0×10^{-4} or 1.0×10^{-5} cm.²sec.⁻¹V⁻¹. It is suggested that in a normal population a small proportion of the pseudomonads can grow in chlorhexidine, and these are selected when chlorhexidine is added; only the most highly adapted of their progeny survive; on transfer to drug-free medium, the culture reverts to the original composition; resistance to chlorhexidine is due to non-absorption by the cells. This is in accordance with the hypothesis of Hamilton (1968).

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A Mutant Strain of *Escherichia coli* Requiring Lipic Acid for Normal Growth

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A mutant of *Escherichia coli* K-12, W-945 (original strain from Professor W. Hayes) was obtained by u.v. irradiation. This mutant, named UV-3, has an exceptionally small colony form when grown on Oxoid nutrient agar and low cytochrome concentrations (particularly cytochrome a_2), and low concentrations of respiratory quinones, and low

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