

Induced turbidity changes in non-growing cultures of *Escherichia coli*

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Non-growing cultures of cells of *Escherichia coli* suspended in glucose free, simple salts media have been shown to exhibit turbidity changes in the presence of hexadecyltrimethyl ammonium bromide (HTAB). The extent of these changes is dependent on medium composition and HTAB concentration and is related to the uptake isotherm for HTAB by the cells (Salt & Wiseman, 1970).

Further studies of the interactions between bacterial cells and other members of the homologous series of which HTAB is a higher member are now reported. Basic conditions of cell cultivation, harvesting and the

method of turbidity assessment (absorbance 650 nm) were as described by Salt & Wiseman (1970).

Figure 1 relates culture turbidity with concentration of the C_8 , C_{10} , C_{12} , C_{14} , C_{16} , and C_{18} homologues of the *N*-alkyltrimethyl ammonium bromides. The influence of alkyl chain length on such a rapidly measurable parameter as culture turbidity is immediately apparent, much lower concentrations of the higher homologues being required to induce turbidity changes. The C_8 , C_{10} and C_{12} compounds produced relatively little or no change in turbidity over the concentration ranges studied, though for all other compounds a general pattern of activity emerges. At low concentration little or no change in turbidity was detected, but for each compound there exists a threshold concentration above which small concentration changes induce large increases in turbidity. This phase of activity terminates in a plateau, the onset of which has been shown, for HTAB, to approximate to the compounds critical micelle concentration in this particular medium as determined using the dye-solubilization technique.

It is well established that members of the *N*-alkyltrimethyl ammonium series become more effective antibacterial agents (see for example Laycock & Mulley, 1970) and comply more fully with the requirements for film penetration specified by Schulman & Rideal (1937a, b) as the series is ascended, tempting the suggestion that the results reported above are indicative of post mortem changes in the cells following penetration of the cell membrane.

If this is so, the measurement of induced turbidity increases in non-growing cultures may provide a useful, rapid means of assessing the antibacterial effectiveness of compounds believed to have a similar mode of action to HTAB.

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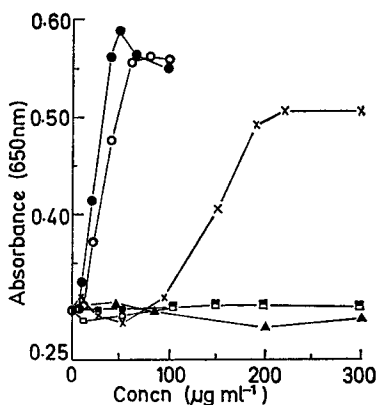


FIG. 1. Turbidity changes (absorbance at 650 nm) in cells of *E. coli* suspended in glucose free media containing different homologues of HTAB, plotted as a function of the homologue concentration. Cell concentration 0.125 mg ml^{-1} . Temperature 25° . Contact time 15 min. ●—● C_{18} ; ○—○ C_{16} ; ×—× C_{14} ; ▲—▲ C_{12} ; □—□ C_{10} ; ■—■ C_8 .

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