Poster Session 1 – Microbiology

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Development of a rapid, high-throughput, colorimetric assay for antimicrobial susceptibility testing

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Selection of an antibiotic for treatment of severe and life-threatening infection is usually made following determination of the susceptibility of the infecting bacteria to a number of antibiotics. Rapid selection and administration of antibiotics is imperative for the successful resolution of these types of infections. Unfortunately, all methods currently employed to determine the susceptibility of infecting bacteria to antibiotics involve overnight incubation of the bacteria in media containing the antibiotic at a range of concentrations, which may result in appropriate antibiotic therapy being delayed. The aim of this project was, therefore, to develop a microtitre-based colorimetric method for susceptibility testing which would provide rapid results and enable appropriate antibiotic therapy to be commenced more quickly.

The Minimum Inhibitory Concentrations (MICs) of a number of antibiotics, for *Pseudomonas aeruginosa* strains were determined using the broth micro-dilution method (Andrews 2001) at 24 h and a colorimetric method at 4 h and the results compared. The colorimetric method used was a modification of the broth micro-dilution method, and is based on the measurement of the metabolic activity of the cells, determined using a formazan salt reduction assay.

There was good correlation between the MICs determined after 4 h using the colorimetric method and the MICs determined after 24 h using the broth microdilution method (Table 1) with differences in MIC greater than one dilution only apparent for 2 strains tested.

Table 1 Susceptibility of *P. aeruginosa* strains to tobramycin determined using broth microdilution (BMD) and colorimetric (COL) methods

Strain	MIC ($\mu g\ mL^{-1}$)	
	BMD	COL
ATCC 27853	1	1
PA01	2	1
CF 4384	0.5	0.5
CF 14685	8	16
CF 14706	1–2	8–16
CF 7307	128	>128
CF 6106	4	4–8
CF 343	16	128

The results of this study suggest that the colorimetric method developed can be used to accurately and rapidly determine the susceptibility of bacteria to antibiotics. The use of this method, therefore, warrants further evaluation as its application in routine susceptibility testing would ensure the earlier commencement of appropriate antibiotic therapy.

Andrews, J. (2001) *J. Antimicrob. Chemother.* **48** (Suppl. S1): 5–16