SUBSTRATE SPECIFICITY OF STREPTOMYCIN-ADENYLATING ENZYMES FROM GRAM-NEGATIVE BACTERIA

Sir:

Studies by RAKE *et al.*[1,2] showed mannosidostreptomycin to be less active and dihydrostreptomycin about equally active to streptomycin in inhibiting most Gram-negative and acid-fast bacteria. DAVIES *et al.*[3] have reported that mannosidostreptomycin and dihydrostreptomycin were adenylated by enzymes from RTF-carrying strains of *Escherichia coli*, but did not indicate the relative efficiencies of adenylation of these substrates. We have examined the adenylation of these 3 streptomycins by crude enzyme preparations (ammonium sulfate precipitated material) from several Gram-negative bacteria using techniques described by YAMADA *et al.*[4] to study adenylation. As is shown in Table 1, mannosidostreptomycin is adenylated at between 10 and 20 % of the rate of streptomycin and dihydrostreptomycin. If this is true for other Gram-negative streptomycin-resistant organisms, mannosidostreptomycin may be a more desirable antimicrobial agent than originally supposed[9,2] in treating infections, especially those carrying RTF for streptomycin.

Table 1. Substrate specificity of adenylating enzymes from Gram-negative bacteria

Culture	Specific activity (units)*		
	Streptomycin	Dihydrostreptomycin	Mannosidostreptomycin
Escherichia coli 8	9.45±0.7	6.15±0.4	2.2 ±0.3
Escherichia coli 15	7.3 ±0.6	6.50±0.8	2.04±0.5
Klebsiella species 24	4.5 ±0.6	2.88±0.3	0.95±0.2
Salmonella typhimurium (culture S-1)	80.5 ±9	75.5 ±6	7.95±0.8

* 1 unit=1 nmole substrate adenylated/mg protein/hr as determined by a modification of the technique described by OZANNE *et al.*[5] using ATP-^{14}C.

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