

'...it has serious side effects such as ototoxicity and nephrotoxicity... this has necessitated the therapeutic drug monitoring of streptomycin ...'

Determination of Streptomycin by Ion-Pair RP-HPLC

Abstract

An isocratic, ion-pair reversed phase HPLC method is described for the determination of Streptomycin. The procedure employs a C18 column with hexanesulfonic acid as the ion-pairing agent, and detection by UV absorbance at 195 nm. The sensitivity is at the sub-ppm level. The retention time for streptomycin is approximately 7 minutes.

Streptomycin, an aminoglycoside, was first isolated by Waksman and co-workers¹ in 1944 from a strain of *Streptomyces griseus*. It exhibits comparable anti-microbial activity against a wide range of gram-negative and positive bacteria as well as mycobacteria. Streptomycin became the first clinically available drug for the treatment of tuberculosis. Despite its clinical usefulness, it has serious side effects such as ototoxicity and nephrotoxicity, which are related to the concentration in serum. This has necessitated the therapeutic drug monitoring of streptomycin.²

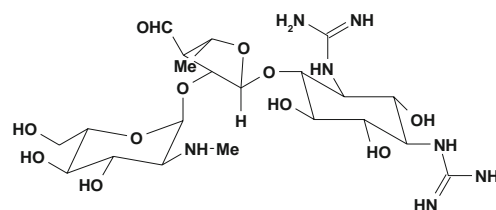
The traditional methods for the analysis of streptomycin are microbiological turbidimetric procedures and plarography. These methods have the disadvantages of being slow, with poor reproducibility and interferences from other co-administered antibiotics. HPLC, with its sensitivity, selectivity, ease-of-operation and speed, offers a powerful alternative for routine analyses over the traditional methods.³

Conditions

Column: Spherisorb S5 ODS, 250 x 4.6 mm ID
 Mobile Phase: 0.025 M Sodium Phosphate Dibasic, 0.01 M hexanesulfonic acid, pH 2.6 / Acetonitrile, (90:100) (Helium Sparging)
 Flow Rate: 1.0 ml/min
 Temperature: 40°C
 Detection: UV at 195 nm

Keywords:

Streptomycin, Aminoglycoside Antibiotic Tuberculosis, Pharmaceutical, Veterinary Medicine, RP-Ion-Pair HPLC



Streptomycin

Acknowledgement

We are grateful to the Department of Agriculture and Rural Affairs (Victoria), for the kind gift of streptomycin.

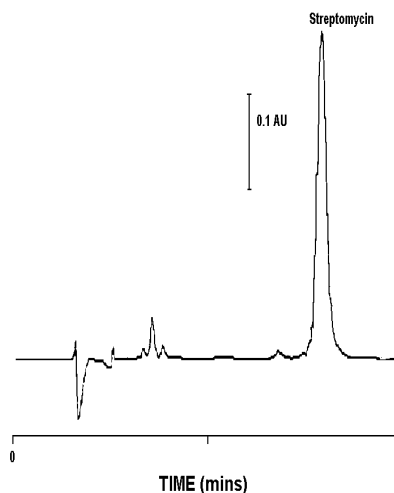


Figure 1 Streptomycin Standard

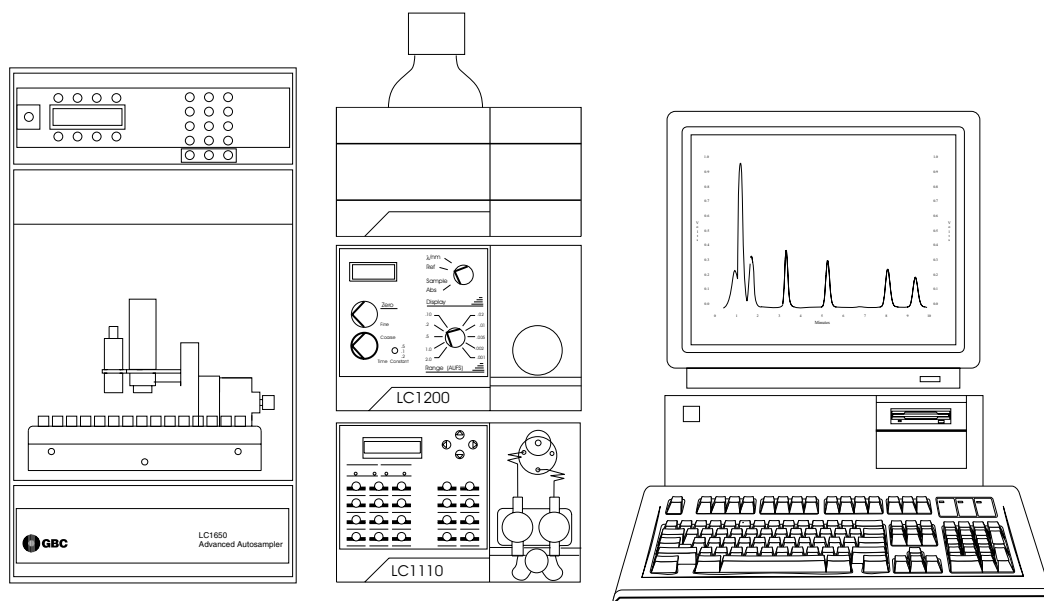


GBC HPLC Instrumentation

LC1110 Dual Piston HPLC Pump
LC1200 Variable Wavelength UV/Vis
Detector
LC1650 Advanced Autosampler
GBC Column Heater
WinChrom Chromatography Data
Management System
LC1440 System Organiser

References

1. A.Schatz, E.Burgie and S.A.Waksman, Proc. Soc. Exp. Biol. Med., 55, (1944), 66.
2. M.Barza and R.T.Scheife, Am. J. Hosp. Pharm., 34, (1977), 723.
3. N.Kurosawa, S.Kuribayashi, E.Owada and K.Ito, J.Chromatogr., 343, (1985), 379.
4. L.T.Wong, A.R.Beaubien and A.P.Pakuts, *ibid.*, 231, (1982), 145.
5. T.J.Whall, *ibid.*, 219, (1981), 89.



P9
01-0380-00

GBC Scientific Equipment Pty Ltd

A.C.N. 005 472 686
12 Monterey Road, Dandenong, Victoria, 3175, Australia
Phone: (03) 9213 3666 Fax: (03) 9213 3677

All rights reserved
GBC publication number 01-0380-00
September, 1995