

ScreenTape® simplifies *Mycobacterium tuberculosis* genotyping

The Lab901 ScreenTape System aids MIRU-VNTR molecular typing of *M. tuberculosis* by providing a simple and rapid solution to gel electrophoresis. Accurate and reproducible sizing ensure the correct assignment of genotype whilst one-click GLP standard reporting facilitates standardised result presentation.

Introduction

Tuberculosis (TB) is an infectious disease caused by *Mycobacterium tuberculosis*. According to the World Health Organisation, 2 million people die of TB worldwide every year. Accurate genotyping aids TB control by determining molecular epidemiological links between patients. It can detect outbreak strains, distinguish reinfection from reactivation and identify contamination in the diagnostic laboratory. Mapping TB strains will assist studies in transmission dynamics and development of new control measures.

Materials and Methods used in the PCR assay

Locus specific PCRs were performed on tubercle bacillus isolates. These reactions use primers targeted to the flanking regions of 15 MIRU-VNTR (Mycobacterial Interspersed Repetitive Units - Variable Numbers of Tandem Repeats) loci (Supply et al. 2006 J. Clin. Microbiol. 44, 4498-4510). The resulting size of the amplicons allows the number of repeats within a locus to be calculated and, once combined for a particular isolate, the data gives strain specific information.

ScreenTape DNA Analysis Procedure

Samples were mixed 1:4 with Lab901 loading buffer and placed in the TapeStation along with D800 ScreenTape. The Lab901 TapeStation controller software was used to select the samples and press 'START'.

Results

Full analysis of 7 samples was achieved in less than 10 minutes compared to over 5 hours using traditional gel electrophoresis. The analysis software was launched immediately and presented each of the samples in turn, with the corresponding fragment lengths for each amplified locus.

ScreenTape used

D800

Convenient set up

No reagent preparation

No gel loading

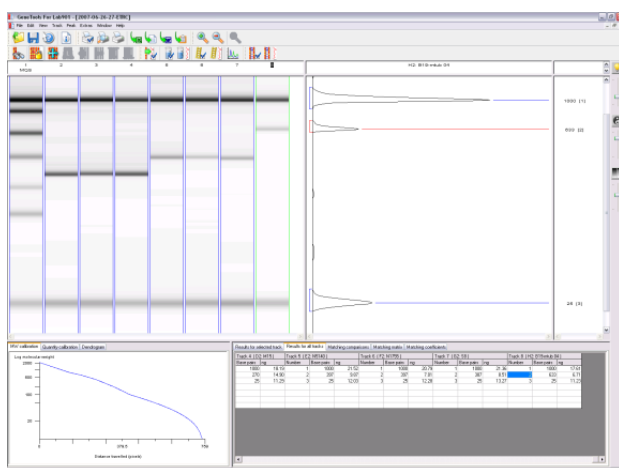
No manual analysis

Total time

10 minutes

Sample volume used

1 µl



Benefits of using ScreenTape for MIRU-VNTR typing

The ScreenTape system dramatically reduces the time needed to accurately identify *M. tuberculosis* strains. Automated analysis enables simple and reproducible diagnosis without any reagent preparation. The TapeStation's small footprint combined with the fully enclosed ScreenTape offers the possibility of field-based operation. Standardised reporting facilitates the sharing of information with regulated formatting. Using the one-click export to Excel and converting the results using a customized macro would allow automated calculation of the number of repeats for each locus and therefore fast and simple TB genotyping.

Figure 1: Representative screen grab of MIRU-VNTR genotyping amplicons analysed on D800 ScreenTape.