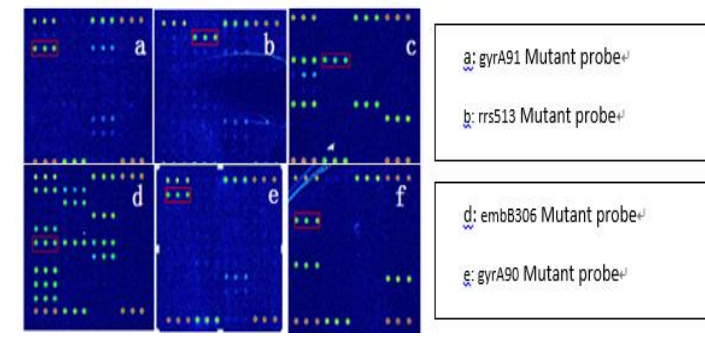
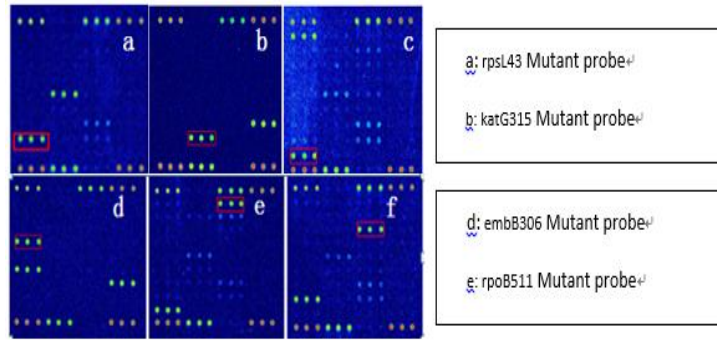
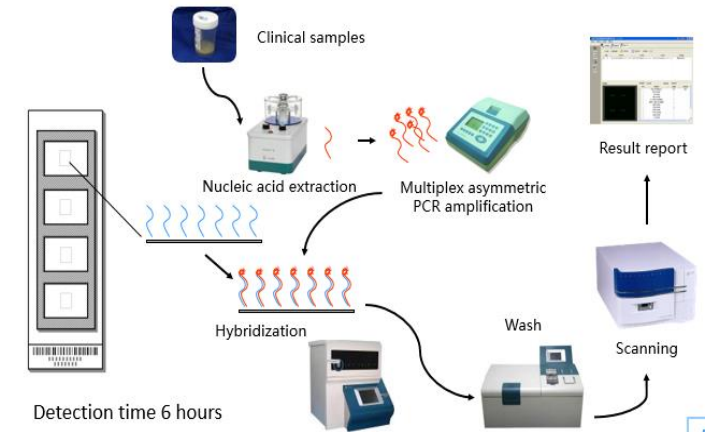
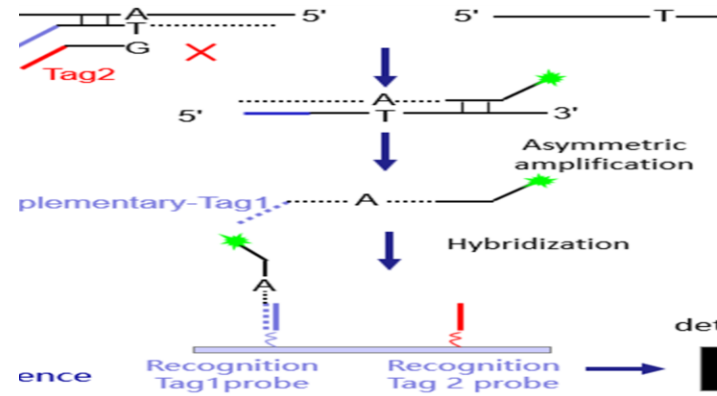






# Simultaneously rapidly diagnose first- and second-line anti-Tuberculosis drug resistance by gene chip tool

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Anti-tuberculosis drugs	Sensitivity (%)	Specificity (%)	Accuracy (%)
RMP	94.40[91.06-97.74]	92.86[89.12-96.60]	93.96[90.46-97.42]
INH	92.37[88.43-96.31]	87.50[82.6-92.41]	90.80[86.51-95.09]
EMB	61.36[51.82-70.90]	89.29[83.23-95.35]	77.00[68.75-85.25]
SM	90.18[85.68-94.68]	89.29[84.61-93.97]	89.88[85.32-94.44]
fQs	79.41[73.10-85.72]	92.86[88.84-96.88]	84.18[78.49-89.87]
SLID	77.61[75.28-79.94]	83.93[77.44-90.42]	80.49[73.49-87.49]

**Table. Sensitivity, specificity and consistency of chip detection and phenotypic resistance**

A Tag Array chip was used to detect plasmids with different template concentrations, then analyzed the sensitivity and specificity. Twenty-four strains of mutant Mycobacterium tuberculosis (MTB) had been sequenced (each strain sample contains only one mutant). The plasmid was diluted into different concentrations, and then multiplex PCR amplification was performed to analyze the sensitivity and specificity. A total of 187 clinical isolates were collected from patients. The sensitivity and specificity of clinical isolates were tested by the second generation chip, and the results were compared with the results of sequencing. The mutants with the template concentration of  $1 \times 10^3$  copies /  $\mu$ l and above showed mutations consistent with the sequencing results. The sensitivity and specificity in specimen of rifampicin (RFP) was 94.40% and 86.76%; isoniazide (INH) was 92.37% and 81.16%; ethambutol (EMB) was 61.36% and 95.80%; fluoroquinolones (FQS) was 79.41% and 92.29%; streptomycin (SM) was 90.17% and 84.00%; second line drugs (SLD) was 77.61% and 87.50%. The Tag Array chip can achieve rapid, accurate drug resistance testing under the condition of not less than  $1 \times 10^3$  copies /  $\mu$ l template concentration which directly apply to clinical isolated strains detection of Tuberculosis resistance.