



CRISPR typing

Mycobacterium tuberculosis
Salmonella enterica serovar typhimurium



The CRISPR locus (Clustred Regularly Interspersed Short Palindromic Repeats) is a genetic marker that allows identification and genotyping of many pathogenic bacteria. It was characterized at the RIVM (Netherlands) under the name of « Direct Repeat locus » in *M. tuberculosis*, the agent of tuberculosis (1). It was used to invent the « spoligotyping » technique which is described in our « spoligotyping » file (2). CRISPR loci are present in 100% of Archaea and 60% of bacteria and are constituted by a conserved sequence regions (the repeats) and variable sequences (the spacers), It plays still poorly known physiological roles, including anti-phage or anti-plasmid invasion defence. CRISPR typing allow to get a fine taxonomic characterization of bacterial species, both intra-specific and bio-geographic of clinical isolates, for molecular epidemiological or populations structure studies . The numerical format obtained (43 or 68 Plex for *Mycobacterium tuberculosis*, 72 Plex for *Salmonella enterica serovar typhimurium* is well-adapted for inter-laboratories comparaisons (3).

Advantages

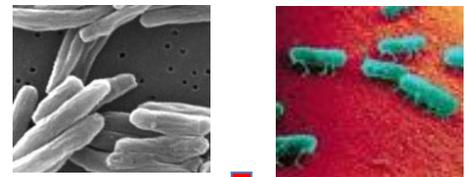
- Sensitive, Specific, Reproducible,
- Cost effective, Robust, Practical
- Fast, Automatized method, High throughput
- Computerized data management
- Numerical results, Databases,
- Training by our experts
- Open Platform (method development)
- Detection of SNP easy

Applications, References

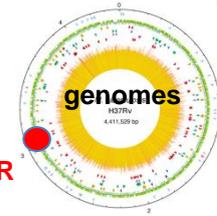
- « **TB-SPOL** » (Spoligotyping *Mycobacterium tuberculosis* complex (BMX-TB-43- BMX-TB-68 series)
- « **STM-CRISPOL** » *Salmonella enterica ser. Typhimurium* (ref. BMX-SE-72 series)
- « **TB-SPRINT** » (Spoligo-rif-inh-typing for MDR-TB) (ref. BMX-TB-59 series)

1. **Kamerbeek J, et al.** (1997) Simultaneous detection and strain differentiation of *Mycobacterium tuberculosis* for diagnosis and epidemiology. *J Clin Microbiol* 35: 907-914.
2. **Gomgnimbou M, et al.** (2013) Tuberculosis-Spoligo-Rifampin-Isoniazid Typing"; an All-in-One assay technique for surveillance and control of multi-drug resistant tuberculosis on Luminex® devices. *J Clin Microbiol*, 51,11, 3527-3534
3. **Fabre L, et al.** (2012) CRISPR typing and subtyping for improved laboratory surveillance of *Salmonella* infections. *PLoS One* 7,5, e36995.

DNA Extraction
(from samples or from culture)

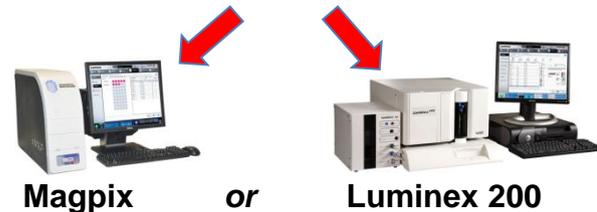


Amplification by PCR of one or many CRISPRs



CRISPR
locus

Hybridization on microbeads, detection



Numerical
Results



Computerized
Data Management

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