Patrick De Marta Giuseppe Firrao

AliScan 1.0

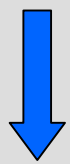
An interactive tool to assist the design of sequence alignment-based probes

DNA arrays

- Study of expression
- Genetic disease detection

Gene-specific probes

- Microbial diagnostics
- Environmental studies



Taxon-specific probes

The presence of **within-taxon variability** introduces problems which are completely unknown in the expression studies

- Diagnostic probes should be designed in regions which are sufficently conserved within each taxon to provide **consistent detection** of all individuals.

Consistency requirement → **Specificity** problem

Conserved region used to design probes → **Limited diversity** amongst sequences of different target taxa

- Diagnostic approach often requires preliminary amplification of targets
  - to detect target DNA in presence of an excess of contaminating DNA
  - to reduce target DNA complexity

Use of alignments of relatively conserved gene sequence regarded as the procedure of choice for the design of diagnostic probes for microbiological arrays

- Optimization of hybridization performances is the main requirement in conventional arrays

- More aspects are to be examined for the design of probes for diagnostic arrays:

Consitency, Specificity, Variability, Taxon definition

Alignment used are often based on '**dirty databases**':
i.e. db containing old sequences or of poor quality with errors, ambiguities or incompletness

Development of oligo probes with fully automated procedures often does not provide satisfactory results

The use of an interactive approach may help to find a compromise when obvious solution is not readly available

AliScan is a web based program, which uses color codes to suggest the most suitable regions in an alignment for probe development.

It does not produce the probes sequences themselves, just suggest the regions of interest and allows to evaluate their suitability at a glance.

Some excellent programmes are readly available for probe design and can be used when the region of choice has been determined.

http://www.biodiv.it