Conformation polymorphism of single chains

This is a technique **for searching for mutations** in the genome. It is among the simplest techniques for this activity. It is often denoted by the abbreviation **SSCP** (single strand conformation polymorphism) .

Principle of technique

Its principle is electrophoresis of single-stranded DNA on a non-denaturing polyacrylamide gel at low temperature. The DNA strand "packs" according to internal complementarities , creating a spatial structure similar to e.g. tRNA . The speed at which single-stranded DNA then travels during nucleic acid electrophoresis depends on the exact conformation. Since even a very small change in the nucleotide sequence can cause the DNA to form a completely different spatial structure, it is **often possible to differentiate even a single base substitution** using SSCP .

Working with PCR

When working with most PCR products, the DNA is separated into two groups of fractions during SSCP: The first group travels more slowly, the bands tend to be sharper and there are more of them. The second faction travels quickly and usually forms a single lane.

There are several reasons why one PCR product forms several bands:

- each strand of denatured DNA assumes a different conformation,
- one chain can form several stable conformations,
- some of the molecules do not form a packed spatial structure,
- part of the molecules renatures into the original double helix and thus homoduplexes are formed again,
- in heterozygotes , part of the molecules can renature to form heteroduplexes.

Reliability of technique

It has been reported that 99% of point mutations can be captured by SSCP when working with a 100-300 bp stretch of DNA, over 80% for stretches of 400 bp. As the length of the examined DNA fragment increases, the efficiency of SSCP decreases, and this technique is not suitable for sections longer than about 750 bp.

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