

A Guide to Sibling Analysis

Test Details

Sibling DNA Testing is used to determine whether two (or more) individuals share one or both biological parents.

Full-Sibling Study

This test is ordered for clients who want to determine if they have both parents in common (share the same mother and the same father).

Half-Sibling Study

This test is ordered for clients who want to determine if they have one parent in common. (share the same mother or the same father).

The Sibling Test Explained

As in a paternity test, a DNA profile is produced for each person. The test analyses different genetic locations on the DNA strand. The allele (alternating form of DNA) at each location is identified by a number. The DNA profiles of the test participants are then compared.

The test is based on the fact that biologically related individuals should have more DNA in common than unrelated individuals.

On average the alleles (numbers) of full siblings will match at more DNA locations than half siblings, and half siblings will match at more than unrelated people.

Inconclusive Results and Test Limitations

Sibling analysis is not as conclusive as paternity testing. The reason for this is that in a paternity test, exactly half of the child's DNA will match the biological father and the other half will match the biological mother.

The DNA of siblings (except identical twins) will not match each other, as the inheritance of alleles (numbers) from biological parents is random. At each genetic location (part of the DNA) a person possesses two alleles (numbers). A person will only pass one of these alleles to their offspring. Which allele is passed on is completely random. Therefore, one child could inherit one allele from his father, while the child's brother or sister could inherit the other.

The result of a sibling analysis is based on statistical calculations that produce a probability indicating whether two individuals are true biological relatives. The statistical analysis is based on factors such as:

- The number of allelic matches within the DNA profiles.
- How likely it is that the same allele would be found at that same DNA location, if testing a random, unrelated individual from the same ethnic background.

These calculations determine the most likely relationship between the individuals tested.

How the results are interpreted

The values from the calculations are used to generate a percentage probability value.

Based on the circumstances provided, a set of hypotheses will have been generated. The calculation compares each hypothesis to determine which scenario is more likely.

The percentage probability will usually fall into one of the three following categories:

0-10%

When a possible relationship/hypothesis generates a percentage probability in this range, the evidence suggests that this relationship **DOES NOT** exist or that the hypothesis suggested is incorrect.

90 - 100%

When a possible relationship/hypothesis generates a percentage probability in this range, the evidence suggests that this relationship **DOES** exist or that the hypothesis suggested is correct.

10 - 90%

Unfortunately the generation of a percentage probability within this range can yield an **INCONCLUSIVE** result. This means that the laboratory does not have enough evidence to provide a result and cannot determine which relationship/hypothesis is more likely.

An **INCONCLUSIVE** result is rare, but as an accredited laboratory, conclusive results will not be issued unless they provide very strong evidence that a relationship does or does not exist.

Causes of inconclusive results include:

- The alleles shared between potential relatives are extremely common within the relevant general population. In these circumstances there is insufficient genetic evidence unique to the individuals being tested to confirm which biological relationship exists.
- Low level of allelic (number) matches in the DNA profile due to the chance nature of inheriting alleles within families (as explained above).
- Mutation causing mismatches at further locations within the DNA profile.

If an **INCONCLUSIVE** result has been given, further analysis will be required. (This may incur an additional fee).

If you require further assistance or have any questions please call:

**UK Customer Services: 0800 988 7107
International /mobile: 0044 (0)161 359 4187**

**or email info@dnaclinics.co.uk
www.dnatestingclinics.co.uk**