

## ITSI Biosciences Newsletter

### In this issue:

- What is an avuncular DNA test?
- How Does it work?
- When do you need a Test?
- What to expect from a test.

## What is an Avuncular DNA Test?

An avuncular DNA test is a type of genetic test that determines whether an individual is biologically related to their aunt or uncle. The term "avuncular" refers to a relationship involving an aunt (maternal or paternal sister) or an uncle (maternal or paternal brother). This test is often used when direct parental testing, such as paternity or maternity tests, is not possible, and there is a need to establish a biological relationship through a sibling of the parent in question. In this newsletter, we will explore what an avuncular DNA test is, how it works, and when it might be necessary.

### 1. Understanding an Avuncular DNA Test

Avuncular DNA testing is typically used to establish a biological relationship between a child and their parent's sibling. It is often conducted when the alleged parent is unavailable for testing due to reasons such as death, absence, or refusal to participate. This test examines the DNA of the child and compares it to the DNA of the alleged aunt or uncle. By analyzing shared genetic markers, the test can determine whether a biological relationship exists. While an avuncular DNA test cannot provide the same level of certainty as a paternity or maternity test, it does offer a probability of biological relatedness. If the alleged aunt or uncle is a full sibling of the child's parent, there will be a significant degree of shared DNA, making the results fairly reliable. However, since aunts and uncles only share about 25% of their DNA with nieces or nephews, the test results are based on statistical probabilities rather than definitive proof.

*Though the results of avuncular tests are based on probabilities, avuncular DNA testing offers a reliable alternative when trying to establish biological ties through an aunt or uncle...*

### 2. How Does an Avuncular DNA Test Work?

The process for an avuncular DNA test is similar to other genetic tests, such as paternity, maternity or sibling DNA tests. First, DNA samples are collected from the child and the alleged aunt or uncle. The most common method for sample collection is through a simple and non-invasive cheek swab, though blood samples can also be used. Once the samples are collected, they are sent to a laboratory for analysis. The lab will examine specific areas of the DNA, known as genetic markers, to determine how much genetic material is shared between the child and the aunt or uncle. The more markers that match, the higher the likelihood of a biological relationship. The results are presented as a probability percentage. A high probability (typically 90% or above) indicates that the child and the alleged aunt or uncle are biologically related. Conversely, a low probability (generally below 10%) suggests that there is no biological relationship.

### 3. When Do You Need an Avuncular DNA Test

There are several scenarios where an avuncular DNA test might be necessary:

a) Establishing Paternity Indirectly: When an alleged father is unavailable for a paternity test, testing one of his siblings (the child's aunt or uncle) can provide an alternative way to determine if there is a biological link. The avuncular test can offer a strong indication of paternity in these situations.

b) Inheritance and Legal Matters: Avuncular DNA tests are often used in inheritance disputes, especially when a parent is deceased and there is a need to prove biological relations for legal or financial reasons. For example, a child may need to prove their biological connection to an uncle or aunt to secure their rightful inheritance.



c) Immigration Cases: In some immigration cases, individuals may be required to prove a biological relationship with an aunt or uncle to gain visas or citizenship based on family connections. An avuncular DNA test can provide the necessary proof to satisfy immigration authorities.

d) Family Reunification or Adoption Cases: An avuncular DNA test can also be used in cases where adopted individuals or those separated from their biological families seek to confirm relationships with aunts or uncles later in life.

#### 4. Accuracy and Limitations of an Avuncular Test

Avuncular DNA tests, while useful, have limitations due to the lower percentage of shared DNA between aunts/uncles and nieces/nephews compared to parent-child relationships. The test provides a probability rather than an absolute result. For this reason, the inclusion of additional family members, such as siblings or cousins, can increase the accuracy of the test.

It is important to remember that full siblings (the child's biological parent and their sibling) will share more DNA than half-siblings, which can influence the test's outcomes. Labs often recommend testing more than one family member, if possible, to ensure more reliable results.

#### Conclusion

An avuncular DNA test is an effective tool for determining biological relationships when direct parental DNA testing is not possible. Whether for legal, immigration, or personal reasons, this test can provide valuable insights into family connections. Though the results are based on probabilities, avuncular DNA testing offers a reliable alternative when trying to establish biological ties through an aunt or uncle.

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