

Further Information

For more information about the Multiple Births Foundation, call us on
020 3313 3519
and request an information pack.

Alternatively, you can log on to our website, at:
www.multiplebirths.org.uk
to find out more.

The Multiple Births Foundation is a charity and relies for its income on grants, donations and fundraising activities.

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**Registered Charity no: 1094546
Limited Company no: 4426289**

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THE MULTIPLE BIRTHS FOUNDATION



Are They Identical?

Zygoty Determination for twins, triplets and more

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AVAILABLE FROM
The Multiple Births Foundation

The Multiple Births Foundation offers a service to determine zygosity from DNA extracted from cheek cells inside the mouth. This is a simple procedure and full instructions are included with the cell collection kit which the lab will send.

For more information or to request an application pack contact the MBF on **020 3313 3519**, email **mbf@imperial.nhs.uk** or visit **www.multiplebirths.org.uk**

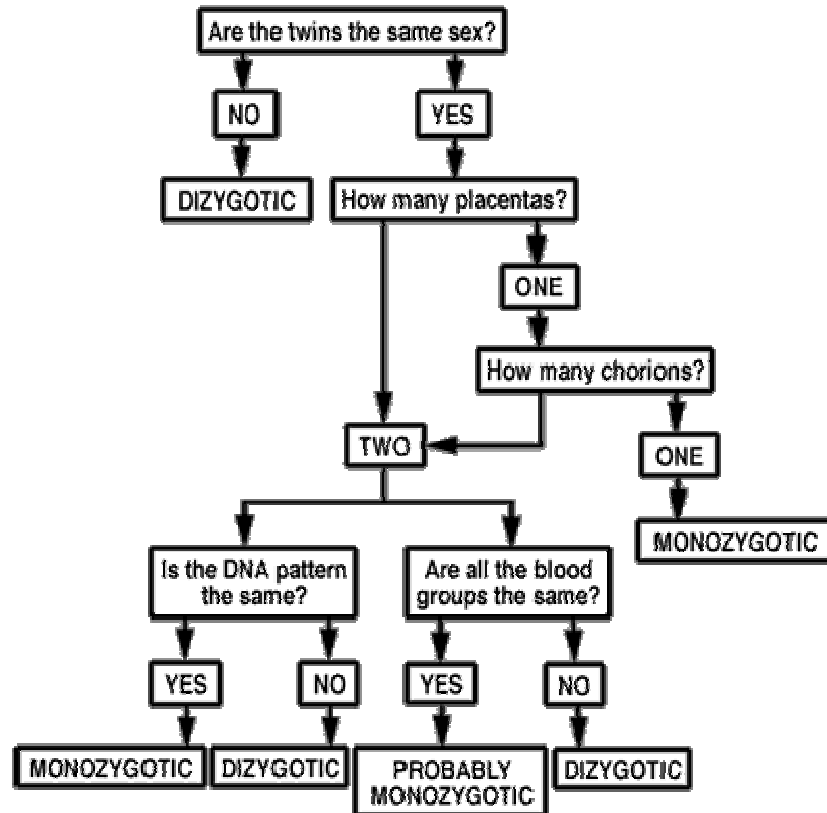
The MBF will send an email with links to the zygosity testing website where the application form can be completed and payment entered.

The laboratory will send a mouth cell collection kit, with instructions on how to do the test. This kit will fit through most letterboxes.

Once the swabs have been taken and returned to the laboratory, you should receive your results within 3-4 weeks. You will be notified directly by the laboratory.

If you have any further queries please contact the MBF on the above number.

The Stages in Determining Zygosity in Twins



Zygosity Determination

What is zygosity determination?

Zygosity determination means finding out whether twins, triplets or more are identical (monozygotic - arising from one egg and one sperm) or non-identical (dizygotic/fraternal - from two separate fertilised eggs). This process is known as zygosity determination.

Why is zygosity determination important?

It is only natural for parents to want to learn all they can about their babies, and with twins this includes their zygosity. Later, the twins themselves are usually keen to know. The reasons given by parents for wanting to know the zygosity of their twins include:

- for their own interest
- to avoid embarrassment when asked the most common question, 'Are they identical?'
- to reinforce their resolve to treat them as individuals if they are identical
- to assess the risks of having twins again (there is an increased risk for women who have non-identical twins).

Furthermore, if the twins wish to participate in any Twins Studies in the future, knowledge of their zygosity will be essential.

How can zygosity be determined?

Physical features

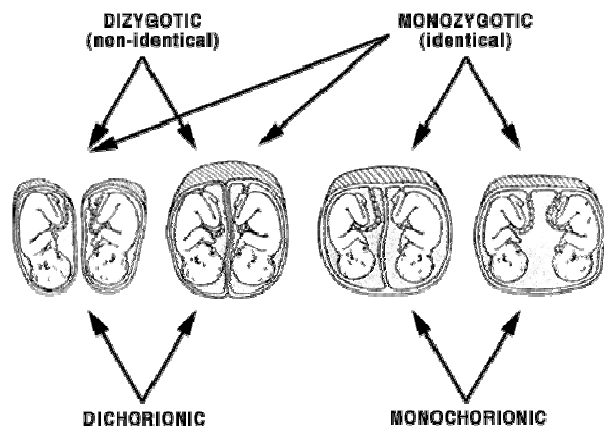
In a third of cases, determination is straightforward, because the children are of different sexes, therefore must be non-identical.

Amongst twins of the same sex, by the time the children are around two years old, their zygosity may be quite clear from their physical features. Colour of hair and eyes, shape of ears, teeth eruption and formation, shape of feet, the creases on the palm of their hands and the pattern of growth should all be the same and can all give a good indication as to whether or not the twins are identical.

Examining the placenta

The placenta provides the answer in two-thirds of monozygotic twins. If the babies have a single outer membrane, (the chorion) they must be monozygotic. But one third of identical twins, those whose egg has split early before the placenta started to form, have two chorions with either a fused placenta, where the two placentae have grown together, or two separate placentae. These placentae are indistinguishable from those of dizygotic twins.

The Relationship between Zygosity and Chorionicity



DNA testing using cells from the inside of the cheek

The most accurate method of determining zygosity is by the DNA probe method.

The first stage in the analysis is to collect tiny amounts of DNA from inside each twin's mouth, using a swab. Recently introduced molecular techniques are used to 'amplify' small sections from a number (currently 16) of specially chosen sites along the DNA.

The laboratory examine specific markers (representing individual regions of the genetic code) present in the DNA of each twin. The **DNA testing using cells from the inside of the cheek**

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The laboratory examine specific markers (representing individual regions of the genetic code) present in the DNA of each twin. The regions have been chosen because most individuals in the population carry slightly different versions of DNA code at these sites. If only one or two of these markers were compared by chance, some non-identical (dizygotic/fraternal) twins, would give the same findings as identical (monozygotic) twins, which is why sixteen of these diagnostic targets are looked at. Although dizygotic twins may share five marker patterns by chance, monozygotic twins will have the same pattern for all sixteen.

The laboratory can determine if twins are identical with a reliability of 99.99995%; in practice actual probabilities can be calculated and provided for each individual twin pair. There is no test currently available that can give a result with 100% certainty. If the results indicate non-identity of the twins, the laboratory can be confident that the findings will only be incorrect in less than about 1 per 10,000 tests.