



 **DNA-TECHNOLOGY**

# **RHESUS INCOMPATIBILITY DETERMINATION**

# Why should I know my Rh factor?

To avoid problems in pregnancy!

Rhesus factor is an antigen (protein) located at the surface of red blood cells (erythrocytes). Positive Rh factor is defined by the presence of the antigen, while negative Rh factor – by its absence.

A pregnancy of a Rh negative woman with a Rh positive fetus can lead to the so-called rhesus incompatibility.

## When rhesus incompatibility can occur?

When red blood cells of a Rh positive fetus come to blood of a pregnant Rh negative woman, her immune system recognizes them as foreign entities. The woman's body starts producing antibodies causing fetal erythrocyte destruction that results in fetal hemolytic disease, anemia and, in most severe cases, can lead to fatal consequences for the mother and the child. Early manifestation of rhesus incompatibility can cause premature delivery or a miscarriage.

As a rule, the first pregnancy is rarely accompanied by rhesus incompatibility. However, the child's blood entering the mother's blood flow during the delivery causes synthesis of antibodies to the child's Rh antigen in the mother's body. Therefore, the risk of rhesus incompatibility increases with each subsequent pregnancy with a Rh positive fetus.

The synthesis of antibodies can also begin if a pregnancy in Rh negative woman passed with a threat of miscarriage or was aborted.

# Rhesus incompatibility prevention and treatment

Specific prevention of rhesus incompatibility is intramuscular administration of anti-rhesus immunoglobulin prescribed to Rh negative women. The dosing schedule should be strictly observed. To relieve rhesus incompatibility, all Rh negative pregnant women receive courses of nonspecific desensitization therapy.

About 40 % of Rh negative mothers can receive no anti-rhesus immunoglobulin and do not require desensitization therapy because of pregnancy with a Rh negative fetus.

Genetic Rh typing of fetus allows to reduce costs for immuno-prophylaxis and additional tests in Rh negative women gestating a Rh negative fetus.



# How to determine the Rh status of a fetus?

It is known that genetic material of a fetus comes to the mother's blood flow during pregnancy. PCR determination of the Rh factor in fetus is an identification of the gene coding the Rh antigen, with an absence of such a gene in the mother, and allows to diagnose Rh type of fetus since 8–10 week of gestation.

This method is non-invasive and does not threaten the pregnancy, because of using mother's venous blood as the material for study.

## Does the non-invasive method for determination of Rh status of fetus have any limitations?

In the majority of cases, Rh negative pregnant women have no Rh factor gene at all. In these cases, a presence or absence of Rh factor gene in the fetus can be determined. However, 1.5-2 % of Rh negative persons have their own Rh factor gene with altered activity.

Therefore, if the mother has her own Rh factor gene (even inactive), it will disguise the Rh factor gene of the fetus. In this case, the presence of the Rh factor in the fetus cannot be determined. If the examination revealed the Rh factor gene, please make sure to inform your attending physician about this. A pregnancy with a Rh positive fetus can lead to rhesus incompatibility.

# Can the test be performed in case of multiple pregnancy?

The test can be performed.

In this case, a negative result will mean that all the fetuses are Rh-negative, and a positive result, that at least one fetus has Rh-factor gene and thus rhesus incompatibility may occur.

## How to prepare for sampling?

The sample should be taken in morning on an empty stomach or after a light fat-free breakfast



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