

Platelet Antigen (HPA1, HPA2, HPA3, HPA4, HPA5, HPA6, and HPA15) Genotyping

FOR DIAGNOSIS OF PERINATAL ALLOIMMUNE THROMBOCYTOPENIA AND POST-TRANSFUSION PURPURA

Disease Overview

- Maternal immunization against fetal platelet alloantigens may result in fetal or perinatal alloimmune thrombocytopenia (PAT). PAT occurs when maternal IgG antibodies, directed toward paternally derived fetal alloantigens on platelets, are transferred across the placenta. The resulting fetal thrombocytopenia may lead to intracranial hemorrhage (20 percent of at-risk cases) and fetal death.
 - Since antenatal platelet typing is not routinely performed, at-risk women are only identified after having a previously affected pregnancy.
 - Clinical correlation between antibody titers and PAT occurrence is not reliable. Specific paternal platelet antigens are demonstrated to react with alloantibodies in only 50 percent of cases; thus, genotyping allows for more accurate risk assessment and better pregnancy management.
 - In-utero treatments include fetal platelet transfusions, intravenous gamma-globulin, or steroids.
 - Post-transfusion purpura is seen most often in post-transfusion women who are human platelet antigen (HPA) 1a-negative and immunized during a previous pregnancy.
- Fetal or neonatal testing when unexplained intracranial hemorrhage is detected.
 - Maternal and paternal testing when the fetus or neonate is suspected to have PAT.
 - Female patients planning a pregnancy who have a sister with a previously affected pregnancy.
 - Patients with post-transfusion purpura.

Additional Ordering Notes

- If testing a neonate or fetus, please send a maternal blood sample, which may be necessary for result interpretation. Alternatively, if the maternal genotype is already known, please provide a copy of the previous result.
- Please include the patient's ethnicity and indication for testing along with the sample(s).

Interpretation

- HPA -a/a homozygous: The sample has two copies of the common human platelet antigen "a" allele.
- HPA -a/b heterozygous: The sample has one copy of the common "a" allele and one copy of the rare "b" allele.
- HPA -b/b homozygous: The sample has two copies of the rare human platelet antigen "b" allele.

Epidemiology

PAT occurs in one in 5,000 births. Post-transfusion purpura is less frequent.

Genetics

- Approximately 16 different types of HPA have been identified.
- The more common allele is designated as "a," while the less common allele is known as "b."
- HPA 1a and HPA 5b are believed to cause 75 percent and 20 percent of PAT in Caucasians, respectively.
- HPA 1-a positive individuals have at least one copy of the "a" allele, while HPA 1-a negative individuals are homozygous for the HPA1-b allele.
- Two percent of women are homozygous for HPA 1-b. These women are at risk for alloimmunization during pregnancy if their partner is homozygous HPA 1-a or heterozygous HPA1-a/b and passes the fetus the HPA 1-a allele.

Methodology

- HPA alleles 1-a/b, 2-a/b, 3-a/b, 4-a/b, 5-a/b, 6-a/b, and 15-a/b are determined using polymerase chain reaction followed by fluorescent resonance energy transfer probes
- Individual tests are available for HPA 1-a/b, HPA 2-a/b, HPA 3-a/b, HPA 4-a/b, HPA 5-a/b, HPA 6-a/b, and HPA 15-a/b, or they can be ordered as a panel.
- Analytic sensitivity and specificity are 99 percent.

Limitations

- HPA alleles, other than the ones tested, will not be determined.
- Rare diagnostic errors may occur due to primer-site mutations.

Indications for Ordering

- Fetal testing when parents have had a prior affected pregnancy.

Related Tests

- Platelet Antigen 1 Genotyping (HPA-1) ([0051309](#))
- Platelet Antigen 2 Genotyping (HPA-2) ([0051310](#))
- Platelet Antigen 3 Genotyping (HPA-3) ([0051311](#))
- Platelet Antigen 4 Genotyping (HPA-4) ([0051490](#))

- Platelet Antigen 5 Genotyping (HPA-5) ([0051312](#))
- Platelet Antigen 6 Genotyping (HPA-6) ([0051313](#))
- Platelet Antigen 15 Genotyping (HPA-15) ([0051314](#))

Reference

1. Online Mendelian Inheritance in Man www.ncbi.nlm.nih.gov.

Test Information

0051308 Platelet Antigen Genotyping Panel

For specific collection, transport, and testing information, refer to the ARUP Web site at www.aruplab.com.

For information on test selection, ordering, and interpretation, refer to ARUP Consult® at www.arupconsult.com.