Fetal Genotyping for Red Cell Antigen Systems

Versiti offers DNA based testing, to identify the presence of fetal red cell antigens RhD, RhC/c, RhE/e, Kell (K/k), Kidd (Jk^a/Jk^b), Duffy (Fy^a, Fy^b, Fynull), M/N, S/s, Dombrock (Do^a/Do^b), Js^a/Js^b, Kp^a/Kp^b, Lutheran (Lu^a/Lu^b)

Hemolytic disease of the fetus and newborn (HDFN) results from sensitization of the mother's immune system to foreign antigens present on the red cells of the fetus. Many red cell antigen systems have been associated with HDFN when incompatibilities exist between the mother and fetus. When a pregnant woman presents with an antibody titer to a blood group antigen, it is important to know the antigen status of the fetus, especially if the father's antigen type is unknown or if he is heterozygous for the antigen system in question. Prenatal genotyping can provide that answer, preventing invasive and expensive monitoring and therapies for fetuses not at risk.

Indications for testing:

- Pregnancy with no history of HDN but with elevated titer of anti-red cell antigen antibodies.
- Previous pregnancy complicated by HDFN with unknown or heterozygous paternal blood type.

Test method:

RhD, RhC/c, and Jka/Jkb antigen systems are detected using allele-specific PCR. RHD, including RHDψ, are detected at exon 4, intron 4, exon 7, intron 7 and W16X. RhE/e, K/k, Fy^a/Fy^b/Fybnull and M/N are detected with fluorescent hydrolysis probes. Dombrock (Do^a/Do^b), Js^a/Js^b, Kp^a/Kp^b, Lutheran (Lu^a/Lu^b), and S/s alleles are detected by gene amplification and FRET hybridization probes.

Assay sensitivity and limitations:

The RhD assay detects the presence or absence of the RhD gene; it does not determine zygosity. The S/s assay may not detect null alleles found in 10-15% of African Americans. Rare variant alleles may not be identified by these assays. Testing parental samples by phenotyping and genotyping is recommended in order to identify discrepancies that may lead to false-negative and false-positive results. Maternal sample is also strongly recommended for maternal contamination studies.

Specimen requirements:

- Fetus (One of the following)
  - 7-15 ml amniotic fluid
  - 2 x 10^6 cultured amniocytes
- Mother and Father
  - 3 ml whole blood collected in EDTAwb

Testing of maternal and paternal samples recommended. The maternal sample is also used to rule out maternal contamination in the fetal sample. Include previous serologic typing results for both parents on the test requisition if available.

SHIP

Shipping requirements:

Ship at room temperature. Insert specimens and the test requisition form into plastic bags and seal. Insert into a Styrofoam container; seal and place into a sturdy cardboard box and tape securely; ship by an overnight carrier. Ship the package in compliance with your overnight carrier guidelines. Please contact your carrier for current biohazard shipping regulations.

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Label with the following address:

Versiti Client Services
Immunohematology Reference Lab
638 N. 18th Street
Milwaukee, WI 53233
800-245-3117, ext. 6250

ORDER

Required forms:

Please complete all pages of the requisition form. Clinical history (including patient's ethnicity, clinical diagnosis, family history and relevant laboratory findings) is necessary for optimal interpretation of genetic test results and recommendations. Clinical and laboratory history can either be recorded on the requisition form or clinical and laboratory reports can be submitted with the sample.

CPT Codes/Billing/Turnaround time:

CPT codes: For recommended CPT codes, visit versiti.org/test-catalog

Turnaround time: 4-6 days

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