Red Cell Genotyping Panel

Phenotyping can be inaccurate for patients who have been recently transfused, when IgG is bound to their red cells (positive DAT), or if an altered or variant antigen is expressed. These phenotyping problems can be circumvented by using molecular techniques. Versiti offers testing to distinguish the blood group alleles present that determine the patient's predicted phenotype.

Patients receiving allogeneic blood products are exposed to blood group antigens expressed on donor red cells. This exposure can lead to alloimmunization in as many as 13% of chronically transfused recipients.[1] In addition to the risks of alloimmunization associated with chronic transfusions, patients with sickle cell disease often have high rates of alloimmunization to red cell antigens due to racial differences between donor and recipient phenotypes.[2] To reduce alloimmunization, precise matching of donor and recipient blood groups is beneficial before the transfusion regimen begins.[3]

Red cell genotyping panels:

Red Cell Genotyping Panel (**44** antigens reported**):
M, N, S, s, U, (including Uvar); C, c, E, e (including partial C, partial c, partial e), V (Rh10), hrS (Rh19), VS (Rh20), hrB (Rh31); K, k, Kpa, Kpb, Jsa, Jsb; Fya, Fyb; Jka, Jkb; Doa, Dob; Hy, Joa; Lua, Lub; Dia, Dib; Yta, Ytb; Coa, Cob; Cra; Vel

**The following Rh antigens are reported as necessary: Crawford (RH43), JAL (RH48), STEM (RH49), CEST (RH57), CELO (RH58), CEAG (RH59), CEVF (RH61).

Indications for testing:

- When phenotyping is not possible due to recent transfusion or a positive DAT.
- To help resolve the weak expression of blood group antigens, for example when two or more serological reagents give conflicting results.
- When a partial or variant antigen is present leading to conflicting serological antibody investigations.
- To provide antigen-negative and crossmatch-compatible blood to help prevent red cell alloimmunization.
- To meet the requirements for ordering rare blood from the ARDP*.

* *The following alleles are provided on patients for ARDP requests: ce(48C), ce(733G), ceS, ceMO, ceEK, ceBI, ceAR, ceAG, ceJAL, ceCF, and ceTI.*

Test method:

Red Cell Genotyping Panel: 72 PCR-hybridization probes are used in 36 polymerase chain reactions to identify the alleles associated with 44 blood group antigens.

Assay sensitivity and limitations:

Mutations outside of the targeted region will not be detected. Novel mutations leading to altered or partial antigen expression and null phenotypes may not be detected by this testing method. Results from stem cell transplant patients may not match genotype obtained from other tissues.

Specimen requirements:

5 ml EDTA (lavender top) whole blood.

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SHIP

Shipping requirements:

Place the specimen and the test requisition form into plastic bags and seal. Insert into a Styrofoam container; seal and place into a sturdy cardboard box, tape securely and ship by an overnight carrier. Ship the package in compliance with your overnight carrier guidelines. Please notify the laboratory if shipping on Friday, Saturday or the day before a holiday. (Call 800-245-3117, ext. 6250). Label with the following address:

Versiti Client Services
Immunohematology Reference Laboratory
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:

Test codes:

Red Cell Genotyping Panel 3530

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

Turnaround time:

Red Cell Genotyping Panel (44 antigen): 2-5 days

Routine testing is performed Monday through Friday. Same day testing upon request. (STAT fee applies)

References:

1. Higgins J, Sloan S. Stochastic modeling of human RBC alloimmunization: evidence for a distinct population of immunologic responders. Blood 2008;112:2546-2553.
2. LaSalle-Williams, M., et. al. Extended red blood cell antigen matching for transfusions in sickle cell disease: a review of a 14-year experience from a single center (CME). Transfusion 2011; 51:1732–1739.
3. Wilkinson, K., et al. (2011). Molecular blood typing augments serologic testing and allows for enhanced matching of red blood cells for transfusion in patients with sickle cell disease. Transfusion doi: 10.1111/j.1537-2995.2011.03288.x

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