RED BLOOD CELL GENOTYPING
PATIENT GENOTYPING PANELS

BloodCenter of Wisconsin's Immunohematology Reference Laboratory offers patient red cell genotyping panels. These panels include common and rare antigens.

BACKGROUND:

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 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]

REASONS FOR REFERRAL:

•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.

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), hr^S (Rh19), VS (Rh20), hr^B (Rh31); K, k, Kp^a, Kp^b, Js^a, Js^b; Fy^a, Fy^b;
Jk^a, Jk^b; Do^a, Do^b; Hy, Jo^a; Lu^a, Lu^b; Di^a, Di^b; Yt^a, Yt^b; Co^a, Co^b; Cr^a; Vel

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

STAT Panel (24 antigens reported):
C, c, E, e, M, N, S, s, U, Uvar, K, k, Fya, Fyb,
Jk^a, Jk^b, Js^a, Js^b, Do^a, Do^b, Lu^a, Lu^b, Kp^a, Kp^b

SPECIMEN REQUIREMENTS:

5 ml EDTA (lavender top) whole blood.

PO Box 2178
Milwaukee, WI 53201-2178
Location/Sample Deliveries:
638 N. 18th St. Milwaukee, WI 53233-2121
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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.
STAT Panel: 32 PCR-hybridization probes are used in 16 polymerase chain reactions to identify the alleles associated with 24 blood group antigens.

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.

SHIPPING REQUIREMENTS:

Place the room temperature specimen and requisition in plastic bags, seal and insert in a Styrofoam container. Seal the Styrofoam container, place in a sturdy cardboard box and tape securely. Ship the package in compliance with your overnight carrier guidelines. Address package to:

Client Services/Immunohematology Reference Laboratory
BloodCenter of Wisconsin
638 N. 18th Street
Milwaukee, WI 53233
800-245-3117, ext. 6250

TURNAROUND TIME:

Routine: 2-5 days STAT(Common Panel): Same day (arriving by 10 am)
Test Schedule: Routine testing is performed Monday through Friday.
Same-day testing upon request (STAT fee applies).

CPT CODES:

Red Cell Genotyping Panel : 81403, 81479
STAT Panel: 81403

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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