HLA Antibody Analysis

Versiti offers a comprehensive approach for detecting and characterizing HLA antibodies along with relevant clinical interpretations for a variety of patient scenarios including platelet transfusion, organ and stem cell transplantation, and emerging therapies.

HLA proteins are extremely polymorphic and highly immunogenic molecules that can stimulate alloantibody production, especially when cells or tissue containing non-self HLA are introduced into the body. This is the basis for humoral rejection during solid organ or stem cell transplant and refractoriness in platelet transfusions. HLA alloantibodies can also be generated following the infusion of many cellular-based therapies and can pose a barrier to their safe and efficacious use. Versiti has deep expertise in detection and characterization of HLA antibodies in many clinical scenarios. The formation of HLA alloantibodies can be monitored by very sensitive methods with high specificity. Antibodies which bind to foreign HLA molecules can be identified at high resolution even in highly sensitized individuals that have pre-existing HLA antibodies such as multiparous women or highly transfused patients.

HLA antibody testing at Versiti includes a variety of approaches and interpretation options:

HLA Antibody Detection – A screening approach used primarily for organ transplant patients to broadly detect the presence/absence of HLA Class I and Class II antibodies using flow cytometry. If presence of an HLA antibody is detected, additional testing may be done using the HLA Antibody Identification tests to provide more detailed results.

HLA Antibody Identification – A semi-quantitative approach to identify HLA antibody specificities. Solid phase single antigen bead assays for HLA Class I and Class II detect HLA antibodies using a panel of specific recombinant HLA antigens. HLA expertise and knowledge of cross-reactive epitope groups is utilized for interpreting antibody patterns and specificities. HLA Antibody Identification Serum Dilution testing is available upon request for highly sensitized patients. HLA Antibody Identification Serum Dilution testing can only be ordered in conjunction with or subsequent to HLA Antibody Identification testing.

Virtual Crossmatch – A virtual crossmatch is an assessment of immunologic compatibility based on the patient's alloantibody profile compared to the donor's histocompatibility antigens[1]. The patient's antibody specificities are assessed for the presence of donor specific antibodies (DSA).

Indications for testing:

- Assessment of HLA antibodies in platelet-refractory patients.
- Evaluation of donor-specific HLA antibodies (DSA) in transplant patients (pre/post transplant).
- Evaluation of effectiveness of desensitization therapies such as intravenous immunoglobulin[2].

Test method:

Patient serum is incubated with solid phase Luminex™ bead panels coupled to HLA antigens. HLA antibodies present in the patient serum will bind to the recombinant antigens and are subsequently labeled with a fluorescently tagged secondary antibody targeting the Fc region. Luminex™ flow instruments are used to detect the mean fluorescence intensity (MFI) of each bead in the panel. Interpretation of the HLA antibodies present and the MFI output is performed by certified histocompatibility specialists using validated software.

For high resolution HLA antibody identification testing a general threshold MFI>1000 is used as a cutoff for determination of antibody positivity. Control values, reagent lot specific reactivity patterns, and patient HLA genotypes all influence the final antibody assignments in a particular sample.

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Assay sensitivity and limitations:

HLA Antibody Identification tests exclusively detect IgG antibodies and no other isotype. Not all HLA antigens or alleles are represented on the antibody test panel and may limit accuracy of virtual crossmatch assessment.

HLA panel specificities can be provided upon request.

Reporting of results:

HLA Antibody Detection testing results are reported as Positive or Negative along with panel reactive antibody (PRA) values.

HLA Antibody Identification test results include a list of detected antigens in serologic nomenclature. For platelet refractory patient workups, a list of permissive antigens and the calculated PRA (cPRA) value are provided in addition to the list of detected antigens.

Virtual Crossmatch assessments provide results as Positive or Negative for predicted T-cell and B-cell flow crossmatches based on the presence/absence of donor-specific HLA antibodies. Sum MFI values of the donor-specific antibodies are included in the interpretation. The values should be considered semi-quantitative and may vary depending on assay and patient-specific factors.

Specimen requirements:

Preferred: One 10 ml Clot Tube (red top) - Do not separate serum from clot

Minimum: One 5 ml Clot Tube (red top) - Do not separate serum from clot

Sample stability is 5 days from collection. Store and ship at room (ambient) temperature

SHIP

Shipping requirements:

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

Client Services/Histocompatibility Laboratory
Versiti
638 N. 18th St
Milwaukee, WI, 53233

ORDER

Required forms:

Histocompatibility Lab Transplant Requisition

Histocompatibility Lab Non-Transplant Requisition (used for platelet-refractory patients)

CPT Codes/Billing/Turnaround time:

Test Name	Order Code
HLA Antibody Detection (Flow Cytometry)	2235
HLA Antibody Identification Class I High Resolution	2226
HLA Antibody Identification Class II High Resolution	2231
HLA Antibody ID Class I Dilution - High Resolution	2225
HLA Antibody ID Class II Dilution - High Resolution	2230
Virtual Crossmatch	2612

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

Turnaround time: 7-10 calendar days based on time of sample receipt.

For additional information related to shipping, billing or pricing, please contact, Versiti Client Services: (414) 937-6396 or 800-245-3117, Option 1, or labinfo@versiti.org.

References:

1. Ellis, T.M. et al., Diagnostic accuracy of solid phase HLA antibody assays for prediction of crossmatch strength. Hum Immunol 73, 706-710, 2012.
2. Ciurea, S.O. et. al. Treatment of allosensitized patients receiving allogeneic transplantation. Blood Advances 5:20, 4031-4043, 2021.

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