

Leukemia and Lymphoma Phenotyping, Technical Only

Test ID: LLTOF

EXPLANATION: Leukemia and Lymphoma Phenotyping, Technical Only will be available December 3, 2013. Upon sample receipt at Mayo Medical Laboratories, flow cytometry analysis will be performed and histograms will be provided back for interpretation through the supplemental reporting feature available in MayoAccess™.

Note: This testing is only available to clients set up to use MayoAccess™.

USEFUL FOR:

- Evaluating lymphocytoses of undetermined etiology
- Identifying B- and T-cell lymphoproliferative disorders involving blood and bone marrow
- Distinguishing acute lymphoblastic leukemia (ALL) from acute myeloid leukemia (AML)
- Immunologic subtyping of acute leukemias
- Distinguishing reactive lymphocytes and lymphoid hyperplasia from malignant lymphoma
- Distinguishing between malignant lymphoma and acute leukemia
- Phenotypic subclassification of B- and T-cell chronic lymphoproliferative disorders, including chronic lymphocytic leukemia, mantle cell lymphoma, and hairy cell leukemia
- Recognizing monoclonal plasma cells

METHODOLOGY: Flow Cytometry

Reflex Tests

| Test ID | Reporting Name | Available Separately | Always Performed |
|---------|--------------------------------------|----------------------|------------------|
| 80997 | Flow Cytometry, Cell Surface, First | No | No |
| 81047 | Flow Cytometry, Cell Surface, Addl | No | No |
| 88465 | Flow Cytometry Interp, 2-8 Markers | No | No |
| 88466 | Flow Cytometry Interp, 9-15 Markers | No | No |
| 88467 | Flow Cytometry Interp, 16 or greater | No | No |
| VBETA | TCR V-BETA | No | No |

Testing Algorithm

When a blood, bone marrow, fluid, or tissue test is ordered, a screening panel will always be performed. The screening panel will be charged based on number of markers tested (80997 for first marker, 81047 for each additional marker). In addition, reflex testing may occur to fully characterize a disease state or clarify any abnormalities from the screening test. Reflex tests will be performed at an additional charge for each marker tested (81047 if applicable).

The triage panel is initially performed on blood, bone marrow, and fluid specimens to evaluate for monotypic B-cells by kappa and lambda light chain expression, increased numbers of blasts by CD34 and CD45 expression along with side scatter gating, and increased plasma cells by CD45 expression and side scatter gating. The triage panel also includes antibodies to assess the number of CD3-positive T-cells and CD16-positive/CD3-negative natural killer (NK) cells present. This triage panel also determines if there is an increase in the number of T-cells that aberrantly coexpress CD16, an immunophenotypic feature of T-cell granular lymphocytic leukemia.

Tissue specimens will be initially evaluated for monotypic B-cells by kappa and lambda light chain expression, CD5, CD10, CD19, CD20, and CD23. Increased numbers of blasts/plasma cells are identified by CD45 expression along with side scatter gating. The tissue panel can also evaluate T-cells with CD3, CD5, and CD7. Additionally, viability is assessed on all tissue specimens using 7-AAD exclusion.

This panel, together with the provided clinical history and morphologic review will determine if additional testing is required. If additional testing is needed, it will be added per algorithm to fully characterize a disease state with a charge per unique antibody tested. See Mayo Medical Test Catalog for further information.

SPECIMEN REQUIREMENTS:

Specimen must arrive within 48 hours of collection for spinal fluid, 72 hours for serous fluids, and 96 hours for peripheral blood, bone marrow, and tissues.

This test is not appropriate for and cannot support diagnosis of sarcoidosis, hypersensitivity pneumonitis, interstitial lung diseases, or differentiating between pulmonary tuberculosis and sarcoidosis (requests for CD4/CD8 ratios). **Specimens sent for these purposes will be rejected.**

The following information is required:

1. Pertinent clinical history including reason for referral or clinical indication
2. Clinical or morphologic suspicion
3. Specimen source
4. Date and time of collection

Forms: Hematopathology Patient Information Sheet (Supply T676) in Special Instructions

Submit only 1 of the following specimens:

Specimen Type: Blood

Container/Tube:

Preferred: Yellow top (ACD solution B)

Acceptable: ACD (solution A), heparin, EDTA

Specimen Volume: 10 mL

Collection Instructions:

1. Do not transfer blood to other containers.
2. Include 5- to 10-unstained blood smears, if possible.
3. Label specimen as blood.

Specimen Stability Information: Ambient <96 hours/Refrigerated < or =96 hours

Specimen Type: Bone marrow

Container/Tube:

Preferred: Yellow top (ACD solution B)

Acceptable: ACD (solution A), heparin, EDTA

Specimen Volume: 1-5 mL

Collection Instructions:

1. Submission of bilateral specimens is not required.
2. Include 5- to 10-unstained bone marrow aspirate smears, if possible.
3. Label specimen as bone marrow.

Specimen Stability Information: Ambient <96 hours/Refrigerated < or =96 hours

Additional Information: If cytogenetic tests are also desired when drawing LLTOF/ Leukemia and Lymphoma Phenotyping, Technical Only, an additional specimen should be submitted. It is important that the specimen be obtained, processed, and transported according to instructions for the other required test.

Specimen Type: Tissue

Container/Tube: Sterile container with 15 mL of tissue culture medium (eg, Hank's balanced salt solution [Supply T132], RPMI, or equivalent)

Specimen Volume: 5 mm(3) or larger biopsy

Collection Instructions:

1. Send intact specimen (do not mince).
2. Specimen cannot be fixed.

Additional Information:

1. Date, time of collection, tissue type, and location are required.
2. A pathology/diagnostic report including the client surgical pathology case number, a brief history, reason for referral or clinical suspicion are required before the specimen will be processed.

Specimen Stability Information: Ambient <96 hours/Refrigerated < or =96 hours

Specimen Type: Fluid

Sources: Serous effusions

Container/Tube: Body fluid container

Specimen Volume: 20 mL

Collection Instructions:

1. If possible, the fluids other than spinal fluid should be anticoagulated with heparin (1 U/mL of fluid).
2. The volume of fluid necessary to phenotype the lymphocytes or blasts in serous effusions depends upon the cell count in the specimen. Usually 20 mL of pleural or peritoneal fluid is sufficient. Smaller volumes can be used if there is a high cell count.
3. Label specimen with fluid type.

Specimen Stability Information: Refrigerated <72 hours/Ambient < or =72 hours

Specimen Type: Spinal fluid

Container/Tube: Sterile vial

Specimen Volume: 1-1.5 mL

Collection Instructions:

1. An original cytopsin preparation (preferably unstained) must be included with the spinal fluid specimen so correlative morphologic evaluation can occur.
2. The volume of fluid necessary to phenotype the lymphocytes or blasts in spinal fluid depends upon the cell count in the specimen. A cell count should be determined and submitted with the specimen. Usually 1 to 1.5 mL of spinal fluid is sufficient. Smaller volumes can be used if there is a high cell count. If cell count is <10 cells/mcL, a larger volume of spinal fluid may be required. When cell counts drop below 5 cells/mcL, the immunophenotypic analysis may not be successful.
3. Label specimen as spinal fluid.

Specimen Stability Information: Refrigerated <48 hours/Ambient < or =48 hours

Additional Information: Spinal fluid cell and differential counts are required.

SPECIMEN MINIMUM VOLUME: Blood: 3 mL/Bone Marrow: 1 mL/Fluid from Serous Effusions: 5 mL/Spinal Fluid: 1 mL/Tissue: 5 mm(3) or larger biopsy

CAUTIONS: Specimens will be initially triaged to determine which, if any, of the immunophenotyping panels should be performed.

CPT CODE:

88184-Flow cytometry; first cell surface, cytoplasmic or nuclear marker

88185-Flow cytometry; additional cell surface, cytoplasmic or nuclear marker (each)

88187-Flow cytometry interpretation, 2 to 8 markers (if appropriate)

88188-Flow cytometry interpretation, 9 to 15 markers (if appropriate)

88189-Flow cytometry interpretation, 16 or more markers (if appropriate)

Additional CPTs may be added if consultative help is needed with the case, or algorithm dictates Mayo consultant involvement.

DAY(S) SET UP: Monday through Saturday

ANALYTIC TIME: 1 day

QUESTIONS: Contact your Mayo Medical Laboratories' Regional Manager or
Julie Breider, MML Laboratory Technologist Resource Coordinator
Telephone: 800-533-1710