Overview

Useful For
Detecting a neoplastic clone associated with the common chromosome abnormalities seen in patients with various B-cell lymphomas using blood or bone marrow specimens

Tracking known chromosome abnormalities and response to therapy in patients with B-cell neoplasms

Reflex Tests

<table>
<thead>
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<th>Test ID</th>
<th>Reporting Name</th>
<th>Available Separately</th>
<th>Always Performed</th>
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<td>IL25</td>
<td>Interphases,</td>
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<td>Interphases, 25-99</td>
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<td>I300</td>
<td>Interphases, &gt;=100</td>
<td>No, (Bill Only)</td>
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</table>

Testing Algorithm
This test includes a charge for application of the first probe set (2 FISH probes) and professional interpretation of results. Additional charges will be incurred for all reflex probes performed. Analysis charges will be incurred based on the number of cells analyzed per probe set. If no cells are available for analysis, no analysis charges will be incurred.

When this test and flow cytometry testing for leukemia/lymphoma are ordered concurrently, the flow cytometry result will be utilized to determine if sufficient clonal B-cells are available for FISH testing. If the result does not identify a sufficient clonal B-cell population, this FISH test order will be canceled and no charges will be incurred.

If FISH testing proceeds, probes will be performed based on the lymphoma subtype suspected/identified utilizing the table "Common Chromosome Abnormalities in B-cell Lymphomas" located in Clinical Information.

If the patient is being tracked for known abnormalities, indicate which probes should be used.

The following probe sets are available within this B-cell lymphoma FISH profile:

-8q24.1 rearrangement, MYC
-t(8;14), MYC/IGH
-18q21 rearrangement, BCL2
-3q27 rearrangement, BCL6
-t(11;14), CCND1/IGH
-17p deletion, TP53/D17Z1
-7q deletion, D7Z1/7q32

-18q21 rearrangement, MALT1

Marginal zone lymphoma (MZL) can be evaluated via probes for specific subtypes, as follows: mucosa-associated lymphoid tissue (MALT) lymphoma or extra-nodal marginal zone lymphoma (ENMZL) using the MALT1 rearrangement probe and splenic marginal zone lymphoma using probes for 7q deletion and 17p deletion. If no MZL subtype is provided, we will evaluate using probes for MALT1, 7q deletion and 17p deletion.

See Bone Marrow Staging for Known or Suspected Malignant Lymphoma Algorithm in Special Instructions.

Special Instructions

- Bone Marrow Staging for Known or Suspected Malignant Lymphoma Algorithm

Method Name
Fluorescence In Situ Hybridization (FISH)

NY State Available
Yes

Specimen

Specimen Type
Varies

Advisory Information
This assay detects chromosome abnormalities observed in the blood or bone marrow of patients with B-cell lymphoma. If a formalin-fixed, paraffin-embedded specimen is submitted, the test will be cancelled and BLYM / B-Cell Lymphoma, FISH, Tissue will be added and performed as the appropriate test.

Shipping Instructions
Advise Express Mail or equivalent if not on courier service.

Necessary Information
1. Provide a reason for testing with each specimen. The laboratory will not reject testing if this information is not provided, but appropriate testing and interpretation may be compromised or delayed.

2. A pathology or flow cytometry report may be requested by the Genomics Laboratory to optimize testing and aid in interpretation of results.

Specimen Required
Submit only 1 of the following specimens:

Preferred:

Specimen Type: Bone marrow

Container/Tube: Green top (sodium heparin)

Specimen Volume: 1-2 mL
**Test Definition: BLPF**  
B-cell Lymphoma, FISH, B/BM

**Collection Instructions:** Invert several times to mix bone marrow.

**Acceptable:**

**Specimen Type:** Blood

**Container/Tube:** Green top (sodium heparin)

**Specimen Volume:** 7-10 mL

**Collection Instructions:** Invert several times to mix blood.

**Specimen Type:** Touch prep or fresh tissue

**Forms**

If not ordering electronically, complete, print, and send a [Hematopathology/Cytogenetics Test Request](T726) with the specimen.

**Specimen Minimum Volume**

Blood: 2 mL  
Bone Marrow: 1 mL

**Reject Due To**

All specimens will be evaluated at Mayo Clinic Laboratories for test suitability.

**Specimen Stability Information**

<table>
<thead>
<tr>
<th>Specimen Type</th>
<th>Temperature</th>
<th>Time</th>
<th>Special Container</th>
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</thead>
<tbody>
<tr>
<td>Varies</td>
<td>Ambient (preferred)</td>
<td></td>
<td>Refrigerated</td>
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</table>

**Clinical and Interpretive**

**Clinical Information**

Lymphoid neoplasms are known to be complex and the prognosis and clinical course of patients with lymphoma is highly variable. Genetic abnormalities have emerged as one of the most reliable criteria for categorizing lymphomas. Several chromosome abnormalities and variants of these abnormalities have been associated with various kinds of lymphoma (see Table).

**Common Chromosome Abnormalities in B-cell Lymphomas**

<table>
<thead>
<tr>
<th>Lymphoma Type</th>
<th>Chromosome Abnormality</th>
<th>FISH Probe</th>
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</thead>
<tbody>
<tr>
<td>Burkitt (pediatric, &lt; or =18 years old)</td>
<td>8q24.1 rearrangement</td>
<td>5'/3' MYC</td>
</tr>
<tr>
<td></td>
<td>t(2;8)(p12;q24.1)</td>
<td>IGK/MYC</td>
</tr>
<tr>
<td></td>
<td>t(8;14)(q24.1;q32)</td>
<td>MYC/IGH</td>
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</table>
## Test Definition: BLPF

**B-cell Lymphoma, FISH, B/BM**

<table>
<thead>
<tr>
<th>Diffuse large B-cell, &quot;double-hit&quot; or &quot;triple hit&quot;</th>
<th>t(8;22)(q24.1;q11.2)</th>
<th>MYC/IGL</th>
</tr>
</thead>
<tbody>
<tr>
<td>3q27 rearrangement</td>
<td>3'/5' BCL6</td>
<td></td>
</tr>
<tr>
<td>18q21 rearrangement</td>
<td>3'/5' BCL2</td>
<td></td>
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</tbody>
</table>

- **Reflex:** t(2;8)(p12;q24.1) IGK/IGH
- **Reflex:** t(8;22)(q24.1;q11.2) MYC/IGL
- **Reflex:** 3q27 rearrangement 3'/5' BCL6
- **Reflex:** 18q21 rearrangement 3'/5' BCL2

### Follicular

- 18q21 rearrangement
- 3q27 rearrangement

### Mantle Cell

- t(11;14)(q13;q32) CCND1/IGH
- **Reflex:** 11q13 rearrangement 5'/3' CCND1
- Blastoid subtype only: deletion of 17p TP53/D17Z1
- Blastoid subtype only: 8q24.1 rearrangement 5'/3' MYC
- Blastoid subtype only: t(8;14)(q24.1;q32) MYC/IGH

### Marginal Zone Lymphoma

- 18q21 rearrangement 5'/3' MALT1
- Deletion of 7q D7Z1/7q32
- Deletion of 17p TP53/D17Z1

### Reference Values

An interpretive report will be provided.

### Interpretation

A neoplastic clone is detected when the percent of cells with an abnormality exceeds the normal reference range for any given probe.

Detection of an abnormal clone supports a diagnosis of a B-cell neoplasm; the specific abnormality detected may help subtype the neoplasm.

The absence of an abnormal clone does not rule out the presence of neoplastic disorder.

### Cautions

This test is not approved by the U.S. Food and Drug Administration and it is best used as an adjunct to existing clinical and pathologic information.

Bone marrow is the preferred sample type for this FISH test. If bone marrow is not available, a blood specimen may be used if there are malignant cells in the blood specimen (as verified by hematopathology).

### Supportive Data

Each probe was independently tested on a set of normal bone marrow control samples and bone marrow samples from patients diagnosed with a B-cell lymphoma. Normal cutoffs were calculated based on the results from 25 normal
specimens. Each probe set was evaluated to confirm the probe set detected the abnormality it was designed to detect.

**Clinical Reference**


**Performance**

**Method Description**

This test is performed using either commercially available or laboratory-developed probes. Rearrangements involving MYC, BCL2, BCL6, or MALT1 are detected using dual-color break-apart (BAP) strategy probes, translocations involving MYC or CCND1 are identified using dual-color, dual-fusion (D-FISH) strategy probes, and deletions (7q32 or TP53) using enumeration strategy probes. For enumeration and BAP strategy probe sets, 200 interphase nuclei are scored; 500 interphase nuclei are scored when D-FISH probes are used. Two technologists analyze each probe set and the results are expressed as the percent abnormal nuclei.(Unpublished Mayo method)

**PDF Report**

No

**Day(s) and Time(s) Test Performed**

Specimens are processed Monday through Sunday.

Results reported Monday through Friday; 8 a.m. to 5 p.m.

**Analytic Time**

7 days

**Maximum Laboratory Time**

10 days

**Specimen Retention Time**

4 weeks

**Performing Laboratory Location**

Rochester

**Fees and Codes**
Test Definition: BLPF
B-cell Lymphoma, FISH, B/BM

Fees
- Authorized users can sign in to Test Prices for detailed fee information.
- Clients without access to Test Prices can contact Customer Service 24 hours a day, seven days a week.
- Prospective clients should contact their Regional Manager. For assistance, contact Customer Service.

Test Classification
This test was developed using an analyte specific reagent. Its performance characteristics were determined by Mayo Clinic in a manner consistent with CLIA requirements. This test has not been cleared or approved by the U.S. Food and Drug Administration.

CPT Code Information
88271x2, 88291-DNA probe, each (first probe set), Interpretation and report
88271x2-DNA probe, each; each additional probe set (if appropriate)
88271x1-DNA probe, each; coverage for sets containing 3 probes (if appropriate)
88271x2-DNA probe, each; coverage for sets containing 4 probes (if appropriate)
88271x3-DNA probe, each; coverage for sets containing 5 probes (if appropriate)
88274 w/modifier 52-Interphase in situ hybridization, <25 cells, each probe set (if appropriate)
88274-Interphase in situ hybridization, 25 to 99 cells, each probe set (if appropriate)
88275-Interphase in situ hybridization, 100 to 300 cells, each probe set (if appropriate)

LOINC® Information

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