Overview

Useful For
Providing genetic information for patients with hypereosinophilic syndrome (HES) and systemic mast cell disease (SMCD) involving CHIC2 deletion

Identifying and tracking chromosome abnormalities and response to therapy

Reflex Tests

<table>
<thead>
<tr>
<th>Test ID</th>
<th>Reporting Name</th>
<th>Available Separately</th>
<th>Always Performed</th>
</tr>
</thead>
<tbody>
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<td>PBCT</td>
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<td>IL25</td>
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<td>Interphases, 25-99</td>
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<td>I300</td>
<td>Interphases, &gt;=100</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.

Method Name
Fluorescence In Situ Hybridization (FISH)

NY State Available
Yes

Specimen

Specimen Type
Varies

Specimen Required
Provide a reason for referral 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.

Advise Express Mail or equivalent if not on courier service.

Submit only 1 of the following specimens:

Specimen Type: Blood
**Container/Tube:** Green top (sodium heparin)

**Specimen Volume:** 7-10 mL

**Collection Instructions:**
1. Invert several times to mix blood.
2. Other anticoagulants are not recommended and are harmful to the viability of the cells.

**Specimen Type:** Bone marrow

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

**Specimen Volume:** 1-2 mL

**Collection Instructions:**
1. Invert several times to mix bone marrow.
2. Other anticoagulants are not recommended and are harmful to the viability of the cells.

**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>
</tr>
</thead>
<tbody>
<tr>
<td>Varies</td>
<td>Ambient (preferred)</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Refrigerated</td>
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**Clinical and Interpretive**

**Clinical Information**

Imatinib mesylate, a small molecule tyrosine kinase inhibitor from the 2-phenylaminopyrimidine class of compounds, has shown activity in the treatment of malignancies that are associated with the constitutive activation of a specific subgroup of tyrosine kinases. A novel tyrosine kinase, generated from fusion of the Fip1-like 1 (*FIP1L1*) gene to the *PDGFRA* gene, was identified in 9 of 16 patients (56%) with hypereosinophilic syndrome (HES). This fusion results from an approximate 800 kb interstitial chromosomal deletion that includes the cysteine-rich hydrophobic domain 2 (*CHIC2*) locus at 4q12. *FIP1L1-PDGFR*A is a constitutively activated tyrosine kinase that transforms hematopoietic...
cells, and is a therapeutic target for imatinib in a subset of HES patients.

Mast cell disease (MCD) is a clinically heterogeneous disorder wherein accumulation of mast cells (MC) may be limited to the skin (cutaneous mastocytosis) or involve 1 or more extra-cutaneous organs (systemic MCD [SMCD]). SMCD is often associated with eosinophilia (SMCD-eos). We recently tested the therapeutic activity of imatinib in 12 adults with SMCD-eos. In this study, we demonstrated that \textit{FIP1L1-PDGFR\(A\)} is the therapeutic target of imatinib in the specific subset of patients with SMCD-eos. Furthermore, we provided evidence that the \textit{CHIC2} deletion is a surrogate marker for the \textit{FIP1L1-PDGFR\(A\)} fusion.

\textbf{Reference Values}

An interpretive report will be provided.

\textbf{Interpretation}

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

Detection of an abnormal clone is usually associated with hypereosinophilic syndrome or systemic mastocytosis associated with eosinophilia.

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

\textbf{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.

\textbf{Supportive Data}

A blinded study using the \textit{FIP1L1/CHIC2/PDGFR\(A\)} tricolor rearrangement probe was performed on 24 samples from patients identified with a 4q12 rearrangement or deletion identified by chromosome analysis and a series of normal control specimens. Rearrangements/deletions were identified in the neoplastic specimens but were not detected in any of the control specimens. The normal controls were used to generate a normal cutoff for this assay.

\textbf{Clinical Reference}


\textbf{Performance}

\textbf{Method Description}

This test is performed using a commercially available tricolor rearrangement probe set including \textit{FIP1L1}, \textit{CHIC2}, and \textit{PDGFRA} at 4q12. The probe set is hybridized to the sample and 2 technologists each analyze 100 interphase nuclei (200 total) with the results expressed as the percent abnormal nuclei. (Unpublished Mayo method)

\textbf{PDF Report}

No
Day(s) and Time(s) Test Performed
Specimens are processed Monday through Sunday.

Results reported Monday through Friday, 8 a.m.-5 p.m.

Analytic Time
6 days

Maximum Laboratory Time
7 days

Specimen Retention Time
4 weeks

Performing Laboratory Location
Rochester

Fees and Codes

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

LOINC® Information
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