Overview

Useful For

Diagnosis and management of patients with gastrointestinal stromal tumors or other related tumors
Identification of a mutation in exon 12 of the PDGFRA gene

This is not appropriate for evaluation of hypereosinophilic syndrome (HES) and systemic mast cell disease involving the FIP1L1-PDGFRA fusion

Additional Tests

<table>
<thead>
<tr>
<th>Test ID</th>
<th>Reporting Name</th>
<th>Available Separately</th>
<th>Always Performed</th>
</tr>
</thead>
<tbody>
<tr>
<td>SLIRV</td>
<td>Slide Review in MG</td>
<td>No, (Bill Only)</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Testing Algorithm

This test is performed in conjunction with SLIRV / Slide Review in MG. Additional testing may be performed after review by pathologist. Upon approval from the requesting clinician, PATHC / Pathology Consultation may be added, if appropriate.

Special Instructions

- Pathology/Cytology Information

Method Name

Polymerase Chain Reaction (PCR) and Sequencing

NY State Available

Yes

Specimen

Specimen Type

Varies

Advisory Information

This is not appropriate for evaluation of hypereosinophilic syndrome (HES) and systemic mast cell disease involving the FIP1L1-PDGFRA fusion. If that evaluation is desired, order CHICF / CHIC2 (4q12) Deletion (FIP1L1 and PDGFRA Fusion), FISH.

Special stains performed outside Mayo Clinic Laboratories and included with the case may be repeated and charged at the reviewing pathologist's discretion. Testing requested by referring physician may not be performed if deemed unnecessary by Mayo Clinic pathologist.

Necessary Information

A pathology/diagnostic report including a brief history is required. If available, include KIT Immunostain results.
Test Definition: PDG12
PDGFRA exon 12, Mutation Analysis

Specimen Required
A quality specimen is essential for evaluation. Submit only tissue containing tumor cells; **minimal tissue is required** for evaluation.

Bone marrow aspirate (in EDTA) and specimens that have been decalcified are not appropriate specimens for this test. If these are received, testing will be canceled.

**Supplies:** Surgical Pathology Packaging Kit (T554) requested, but not required

Preferred:

**Specimen Type:** Formalin-fixed, paraffin-embedded (FFPE) tissue block with a minimum of 60% tumor cell population

**Collection Instructions:** Process all specimens into FFPE tissue blocks prior to submission.

Acceptable:

**Specimen Type:** Unstained slides with a minimum of 60% tumor population; slides may be stained and/or scraped.

**Slides:** A minimum of ten, 4- to 5-micron thick, unstained slides are required.

**Forms**
1. Pathology/Cytology Information (T707) in Special Instructions
2. If not ordering electronically, complete, print, and send an Oncology Test Request (T729) with the specimen.

**Reject Due To**

<table>
<thead>
<tr>
<th>Tissue</th>
<th>Specimens that have been decalcified (all methods); specimens that have not been formalin-fixed, paraffin-embedded</th>
</tr>
</thead>
</table>

**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>
</tr>
<tr>
<td></td>
<td>Frozen</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Refrigerated</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Clinical and Interpretive**

**Clinical Information**

Occasional cases of gastrointestinal stromal tumors (GIST) can harbor mutations in PDGFRA, a gene structurally related to KIT. The frequency and type of mutations vary among these tumors and portent distinct clinical implications. The ordering physician is responsible for the diagnosis and management of disease and decisions.
Test Definition: PDG12
PDGFRA exon 12, Mutation Analysis

based on the data provided.

Reference Values
An interpretative report will be provided.

Interpretation
Results are reported as positive, negative, or failed. A negative result does not rule out the presence of a mutation.

Cautions
Reliable results are dependent on adequate specimen collection and processing. This test has been validated on formalin-fixed, paraffin-embedded tissues; other types of fixatives are discouraged. Improper treatment of tissues, such as decalcification, may cause PCR failure. False-negative results may occur in heterozygous tumor specimens when tumor cells comprise less than 60% of the cell population. Tumor cells are routinely enriched by macrodissection to avoid false-negative results.

PDGFRA mutations may be occasionally found in inflammatory fibroid polyps.(1)

Clinical diagnosis and therapy should not be based solely on this assay. The results should be considered in conjunction with clinical information, histologic evaluation, and additional diagnostic tests.

This test is unable to distinguish between a somatic and a germline KIT (or PDGFRA) mutation. Germline KIT (or PDGFRA) mutations are rare and their clinical relevance has been described in more detail in Clinical References 2 and 3. Testing of a peripheral blood specimen from this individual would be required to distinguish a germline from a somatic mutation; this testing is not currently offered at Mayo Clinic.

Supportive Data
We studied a set of 75 formalin-fixed, paraffin-embedded specimens: 40 classic gastrointestinal stromal tumors (GIST), 10 unrelated tumors, 21 neuroendocrine tumors, and 4 other tumors (2 metastatic melanomas, 1 breast cancer, and 1 squamous cell carcinoma). The literature reports that approximately 80% of GISTs harbor a mutation in KIT gene, while 2% to 5% harbor mutations in PDGFRA. Overall, we found 83% of GISTs tested demonstrated mutations in KIT and/or PDGFRA, which is in accordance with the literature.

Clinical Reference


Performance

Method Description
The paraffin-embedded tissue is macroscopically examined and the tumor-rich portion is dissected, deparaffinized, lysed, and digested. Genomic DNA is extracted using either a phenol-chloroform method or the QIAamp DNA FFPE Tissue kit (Qiagen). The DNA is amplified via PCR. Primers specific for PDGFRA exon 12 are used. Controls are run with each specimen to assess possible contamination issues and overall test performance. The patient and control samples are sent for direct DNA sequencing. The sequencing chromatograms are analyzed by manual and software methods and the presence or absence of a PDGFRA exon 12 mutation is determined. The results are interpreted and reported by a working group pathologist.(Instruction manual: Qiagen DNA FFPE Tissue Handbook; unpublished Mayo method)

PDF Report
No

Day(s) and Time(s) Test Performed
Monday through Friday; Varies

Analytic Time
14 days

Maximum Laboratory Time
20 days

Specimen Retention Time
Unused portions of blocks will be returned. Unused slides are stored indefinitely.

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 and its performance characteristics 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
81314-PDGFRA (platelet-derived growth factor receptor alpha polypeptide) (eg, gastrointestinal stromal tumor [GIST]), gene analysis, targeted sequence analysis (eg, exons 12, 18)

88381-Microdissection, manual
### Test Definition: PDG12
PDGFRA exon 12, Mutation Analysis

#### LOINC® Information

<table>
<thead>
<tr>
<th>Test ID</th>
<th>Test Order Name</th>
<th>Order LOINC Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDG12</td>
<td>PDGFRA exon 12, Mutation Analysis</td>
<td>In Process</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Result ID</th>
<th>Test Result Name</th>
<th>Result LOINC Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>54835</td>
<td>Result Summary</td>
<td>50397-9</td>
</tr>
<tr>
<td>54836</td>
<td>Result</td>
<td>82939-0</td>
</tr>
<tr>
<td>54837</td>
<td>Interpretation</td>
<td>69047-9</td>
</tr>
<tr>
<td>54838</td>
<td>Additional Information</td>
<td>48767-8</td>
</tr>
<tr>
<td>54839</td>
<td>Reason for Referral</td>
<td>42349-1</td>
</tr>
<tr>
<td>54840</td>
<td>Specimen</td>
<td>31208-2</td>
</tr>
<tr>
<td>54841</td>
<td>Source</td>
<td>31208-2</td>
</tr>
<tr>
<td>54842</td>
<td>Tissue ID</td>
<td>80398-1</td>
</tr>
<tr>
<td>54843</td>
<td>Released By</td>
<td>18771-6</td>
</tr>
</tbody>
</table>