Test Definition: PLASF

Plasma Cell Proliferative Disorder, FISH, Tissue

Overview

Useful For

Supporting the diagnosis of plasmacytoma or myeloma when coordinated with a surgical pathology consultation

Reflex Tests

Test Id	Reporting Name	Available Separately	Always Performed
_I099	Interphases, 25-99	No, (Bill Only)	No
_I300	Interphases, >=100	No, (Bill Only)	No
_IL25	Interphases, <25	No, (Bill Only)	No
_PADD	Probe, +1	No, (Bill Only)	No
_PB02	Probe, +2	No, (Bill Only)	No
_PB03	Probe, +3	No, (Bill Only)	No
_PBCT	Probe, +2	No, (Bill Only)	No

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. No analysis charges will be incurred if an insufficient number of representative cells are available for analysis.

A minimum of 35% plasma cell involvement is required for a successful paraffin plasma cell fluorescence in situ hybridization (FISH) evaluation. If a bone marrow clot specimen is submitted with less than 35% plasma cell involvement, the PLASF / Plasma Cell Proliferative Disorder, FISH, Tissue will be canceled.

For decalcified (bone) specimens, one FISH probe (break apart IGH) will be attempted. If this FISH probe is unsuccessful, testing will be canceled due to lack of hybridization as a result of the decalcification process. If the IGH FISH probe is successful, additional FISH probes will be evaluated as listed below.

The initial diagnostic panel includes testing with the following FISH probes:

17p-, *TP53*/D17Z1
1q gain, *TP73*/1q22
14q32 rearrangement, *IGH*

Based on the results from the initial panel, reflex testing may be performed using the following FISH probes:

t(11;14)(q13;q32), *CCND1*::*IGH*
t(14;16)(q32;q23) *IGH*::*MAF*
t(4;14)(p16.3;q32) *FGFR3*::*IGH*
t(14;20)(q32;q12) *IGH*::*MAFB*

For specimens sent for **follow-up** testing after completion of initial testing, the following probes will be evaluated if sufficient plasma cells are identified:

17p-, TP53/D17Z1
1q gain, TP73/1q22
8q24.1 rearrangement, MYC break-apart

Appropriate ancillary probes may be performed at consultant discretion to render comprehensive assessment. Any additional probes will have the results included within the final report and will be performed at an additional charge.

Method Name
Fluorescence In Situ Hybridization (FISH)

NY State Available
Yes

Specimen

Specimen Type
Tissue

Ordering Guidance
This test does not include a pathology consultation. If a pathology consultation is requested, order PATHC / Pathology Consultation, and appropriate testing will be added at the discretion of the pathologist and performed at an additional charge.

For the most complete genetic evaluation on fresh bone marrow specimens, order MPCDS / mSMART, Plasma Cell Proliferative Disorder, FISH, Bone Marrow.

For evaluation of high-risk abnormalities in addition to CCND1/IGH fusion on fresh bone marrow specimens, order PCPDS / Plasma Cell Proliferative Disorder, High Risk with Reflex Probes, Diagnostic FISH Evaluation, Bone Marrow.

For fixed cell pellet specimens, order MFCDF / Myeloma, High Risk with Reflex Probes, Diagnostic FISH Evaluation, Fixed Cell Pellet

Testing will be changed to the appropriate test if this test is ordered on either of the previous specimen types.

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

Necessary Information
1. A pathology report is required for testing to be performed. If not provided, appropriate testing and/or interpretation may be compromised or delayed. Acceptable pathology reports include working drafts, preliminary pathology, or surgical pathology reports.

2. The following information must be included in the report provided.
1. Patient name
2. Block number - must be on all blocks, slides, and paperwork
3. Date of collection
4. Tissue Source

3. A reason for testing must be provided. If this information is not provided, an appropriate indication for testing may be entered by Mayo Clinic Laboratories.

Specimen Required

Submit only 1 of the following specimens:

Specimen Type: Tissue
Preferred: Tissue block
Collection Instructions: Submit a formalin-fixed, paraffin-embedded tumor tissue block. Blocks prepared with alternative fixation methods may be acceptable; provide fixation method used.

Acceptable: Tissue slides
Slides: 1 Hematoxylin and eosin stained and 10 unstained
Collection Instructions: Submit 10 consecutive unstained, positively charged, unbaked slides with 5 micron-thick sections of the tumor tissue and 1 slide stained with hematoxylin and eosin.

Forms

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

Specimen Minimum Volume

Tissue block: 1 block
Tissue slides: 1 Hematoxylin and eosin stained and 7 unstained

Reject Due To

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

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Tissue	Ambient (preferred)		
	Refrigerated		

Clinical & Interpretive

Clinical Information

A plasmacytoma is a localized proliferation of plasma cells that are cytologically and immunophenotypically identical to the plasma cell clones seen in myeloma. There are 2 primary types of plasmacytomas, solitary plasmacytoma of bone (SPB) and extramedullary plasmacytoma (EP).

SPBs are a localized bone tumor comprised of plasma cells and account for about 5% of all plasma cell neoplasms. Common sites for SPBs are the vertebrae, ribs, skull, pelvis, femur, clavicle, and scapula. Patients often present with

pathological fracture or bone pain near the lesion. Treatment is typically radiation therapy; at 10 years, 35% of patients appear to be cured, 55% develop myeloma, and 10% have local recurrence.

EPs are tumors of plasma cells that form in areas away from the bone and account for 3% to 5% of all plasma cell neoplasms. Approximately 80% of EPs occur in the upper respiratory tract. Less common locations include the gastrointestinal tract, bladder, testis, central nervous system, and skin. Treatment consists of radiation therapy. Regional recurrence develops in about 25% of patients, but development of myeloma is less frequent, occurring in only about 15% of patients.

Genetics of both types of plasmacytomas, while not extensively studied, appear to be the same as plasma cell myeloma.

Paraffin plasma cell fluorescence in situ hybridization evaluation of bone marrow clot specimens is also important when a fresh bone marrow specimen is not available or is unsuccessful in the initial/diagnostic evaluation to document the genetic abnormalities associated with a patient's plasma cell clone.

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 a given probe set.

A positive result supports the diagnosis of a plasmacytoma or myeloma.

A negative result does not exclude the diagnosis of a plasmacytoma or myeloma.

Cautions

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

Fixatives other than formalin (eg, Prefer, Bouin's) may not be successful for fluorescence in situ hybridization (FISH) assays. Non-formalin fixed specimens will not be rejected.

Paraffin-embedded tissues that have been decalcified may not be successful for FISH analysis. The success rate of FISH studies on decalcified tissue is approximately 50%, but FISH will be attempted if sufficient tumor is present for analysis.

If no FISH signals are observed post-hybridization, the case will be released indicating a lack of FISH results.

Supportive Data

Each probe was independently tested and verified on paraffin-embedded tissue specimens. Normal cutoffs were calculated based on the results of at least 25 normal specimens. For each probe set a series of chromosomally abnormal specimens were evaluated to confirm each probe set detected the anomaly it was designed to detect.

Clinical Reference

1. Campo E, Harris NL, Jaffe ES, Pileri SA, Thiele J, eds. WHO Classification of Tumours of Haematopoietic and Lymphoid Tissues. IARC Press; 2017

2. Nolan KD, Mone MC, Nelson EW. Plasma cell neoplasms: review of disease progression and report of a new variant. Surg Oncol. 2005 Aug;14(2):85-90
3. Dingli D, Kyle RA, Rajkumar SV, et al. Immunoglobulin free light chains and solitary plasmacytoma of bone. Blood. 2006;108(6):1979-1983

Performance

Method Description

This test is performed using both commercially available and laboratory-developed probes. Deletion or monosomy of chromosome 17 and copy number gain of 1q are detected using enumeration strategy probes. Rearrangement involving *IGH* is detected using a dual-color break-apart (BAP) strategy probe. Dual-color, dual-fusion fluorescence in situ hybridization (D-FISH) strategy probe sets are used in reflex testing when rearrangements of the *IGH* gene are detected. Formalin-fixed, paraffin-embedded tissues are cut at 5 microns and mounted on positively charged glass slides. The selection of tissue and the identification of target areas on the hematoxylin and eosin (H and E)-stained slide are performed by a pathologist. Using the H and E-stained slide as a reference, target areas are etched with a diamond-tipped engraving tool on the back of the unstained slide to be assayed. The probe set is hybridized to the appropriate target areas and 2 technologists each independently analyze 50 interphase nuclei (100 total) with the results expressed as the percent of abnormal nuclei.(Unpublished Mayo method).

PDF Report

No

Day(s) Performed

Monday through Friday

Report Available

7 to 10 days

Specimen Retention Time

Slides and H and E used for analysis are retained by the laboratory in accordance with regulatory requirements. Client provided paraffin blocks and extra unstained slides will be returned after testing is complete.

Performing Laboratory Location

Rochester

Fees & 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 account representative. 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. It has not been cleared or approved by the US 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

Test ID	Test Order Name	Order LOINC® Value
PLASF	Plasma Cell Prolif, FISH, Ts	In Process

Result ID	Test Result Name	Result LOINC® Value
52219	Result Summary	50397-9
52221	Interpretation	69965-2
52220	Result Table	93356-4
54593	Result	62356-1
CG753	Reason for Referral	42349-1
52222	Specimen	31208-2
52223	Source	31208-2
52224	Tissue ID	80398-1
52225	Method	85069-3
55033	Additional Information	48767-8
52226	Released By	18771-6
53823	Disclaimer	62364-5