MAYO CLINIC LABORATORIES

Test Definition: MASF

Angiosarcoma, MYC (8q24) Amplification, FISH, Tissue

Overview

Useful For

Identifying *MYC* amplification to aid in the differentiation of cutaneous angiosarcomas from atypical vascular lesions after radiotherapy

Reflex Tests

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

Testing Algorithm

This test includes a charge for the probe application, analysis, and professional interpretation of results for one probe set (2 individual FISH probes). 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.

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.

Multiple oncology (cancer) gene panels are also available. For more information see Hematology and Oncology Test Selection Guide.

Additional Testing Requirements

To resolve atypical fluorescence in situ hybridization results, confirmation testing by microarray testing is available; order CMAPT / Chromosomal Microarray, Tumor, Formalin-Fixed Paraffin-Embedded.

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 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**:
-Patient name
-Block number-must be on all blocks, slides, and paperwork
-Date of collection
-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:

Preferred
Specimen Type: Tissue block (fresh tissue is **not acceptable**)
Collection Instructions:
1. Submit a formalin-fixed, paraffin-embedded tumor tissue block.
2. Blocks prepared with alternative fixation methods (eg, Prefer, Bouin's) will be attempted but are less favorable for successful results. Provide fixation method used.
Additional Information:
1. Paraffin-embedded specimens can be from any anatomic location (skin, soft tissue, lymph node, etc).
2. Decalcified paraffin-embedded specimens will have testing attempted; however, the success rate is approximately 50%. **Testing may be canceled** if sufficient tumor tissue is not present.
3. **Submitted fresh tissue specimens will be canceled upon receipt**. If only fresh tissue is available, embed in paraffin prior to sending.

Acceptable:
Specimen Type: Tissue slides
Slides: 1 Hematoxylin and eosin stained and 4 unstained
Collection Instructions: Submit 4 consecutive unstained, positively charged, unbaked slides with 5 micron-thick sections of the tumor tissue and 1 slide stained with hematoxylin and eosin.

Additional Information: Broken or cracked unstained slides will be rejected. Stained slides that were broken and repaired (ie, double mounted) at the client site will not be rejected, as, in most cases, they can still be reviewed under the microscope. However, due to the double mounting, digital scanning cannot be performed.

Forms

If not ordering electronically, complete, print, and send an Oncology Test Request (T729) with the specimen.

Specimen Minimum Volume

Slides: 1 Hematoxylin and eosin stained and 2 unstained

Reject Due To

Broken or cracked unstained slides	Reject
Broken or cracked stained slides that cannot be repaired	Reject

Specimen Stability Information

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

Clinical & Interpretive

Clinical Information

Post-radiation cutaneous angiosarcoma is a malignancy associated with very poor outcome and is consequently treated aggressively. Atypical vascular lesions are also associated with radiation therapy but are considered to be benign and do not require aggressive management. Therefore, the differentiation of these neoplasms is of considerable clinical importance. Post-radiation cutaneous angiosarcomas often demonstrate high-level amplification of *MYC*, whereas reactive and benign vascular lesions do not show amplification of *MYC*.

Reference Values

An interpretive report will be provided.

Interpretation

MYC will be clinically interpreted as positive, negative, or equivocal.

The *MYC* locus is reported as amplified when the MYC:D8Z2 ratio is 2.0 or greater and demonstrates 6 or more copies of *MYC*.

A MYC:D8Z2 ratio less than 2.0 or showing a ratio of 2.0 or greater with less than 6 copies of *MYC* is considered to lack amplification of *MYC*.

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.

This fluorescence in situ hybridization (FISH) assay does not rule out other chromosome abnormalities.

Fixatives other than formalin (eg, Prefer, Bouin's) may not be successful for 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.

Fluorescence in situ hybridization studies will be attempted if sufficient tumor is present for analysis. The pathologist reviewing the hematoxylin and eosin-stained slide may find it necessary to cancel testing if insufficient tissue/tumor is available for testing.

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

Broken or cracked unstained slides are not compatible with the instrumentation used in our performing laboratories and will be rejected. Additional material may be requested.

Attempts will be made to repair broken or cracked stained slides; however, if they are unable to be repaired (ie, shattered in transit), they will be rejected and discarded due to safety concerns.

Supportive Data

The probe set was independently validated in a blinded study on 23 paraffin-embedded primary and post radiation angiosarcoma tissue samples and 25 noncancerous control specimens. The normal controls were used to generate the normal cutoffs. *MYC* amplification was detected in 4 (17.4%) of the angiosarcomas and the incidence is consistent with published reports.

Clinical Reference

1. Mentzel T, Schildhaus H, Palmedo G, Buttner R, Kutzner H. Postradiation cutaneous angiosarcoma after treatment of breast carcinoma is characterized by *MYC* amplification in contrast to atypical vascular lesions after radiotherapy and control cases: clinicopathological, immunohistochemical and molecular analysis of 66 cases. Mod Pathol. 2012;25(1):75-85

2. Manner J, Radlwimmer B, Hohenberger P, et al. *MYC* high level gene amplification is a distinctive feature of angiosarcomas after irradiation or chronic lymphedema. Am J Pathol. 2010;176(1):34-39. doi:10.2353/ajpath.2010.090637

3. WHO Classification of Tumours Editorial Board. Soft Tissue and Bone. 5th ed. IARC; 2020. World Health Organization Classification of Tumours. Vol 3

Performance

Method Description
This test is performed using a commercially available probe set with a MYC probe and a chromosome 8 centromere probe (D8Z2). Paraffin-embedded tissue samples 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. Each probe set is hybridized to the appropriate target areas, as indicated on the H and E, and 60 interphase nuclei are scored within the targeted areas. The results are expressed as a ratio of MYC:D8Z2 signals.(Unpublished Mayo method)

PDF Report
No

Day(s) Performed
Monday through Friday

Report Available
7 to 10 days

Specimen Retention Time
Slides used for analysis are retained by the laboratory in accordance with regulatory requirements. Client provided paraffin blocks and extra unstained slides (if provided) will be returned after testing is complete.

Performing Laboratory Location
Mayo Clinic Laboratories - Rochester Main Campus

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
MASF	MYC (8q24), Angiosarcoma, FISH, Ts	101384-6

Result ID	Test Result Name	Result LOINC® Value
54606	Result Summary	50397-9
54609	Interpretation	69965-2
54608	Result	62356-1
CG896	Reason for Referral	42349-1
54610	Specimen	31208-2
54611	Source	31208-2
54612	Tissue ID	80398-1
54613	Method	85069-3
54614	Released By	18771-6
55126	Additional Information	48767-8
53818	Disclaimer	62364-5