MAYO CLINIC LABORATORIES

Test Definition: SS18F

SS18, Synovial Sarcoma, FISH, Ts

Overview

Useful For

Supporting the diagnosis of synovial sarcoma when used in conjunction with an anatomic pathology consultation

Testing Algorithm

This test does not include a pathology consult. If a pathology consultation is requested, PATHC / Pathology Consultation should be ordered and the appropriate FISH test will be ordered and performed at an additional charge.

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.

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

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 desired, order PATHC / Pathology Consultation.

Shipping Instructions

Advise Express Mail or equivalent if not on courier service.

Necessary Information

1. A pathology report is required in order for testing to be performed. Acceptable pathology reports include working drafts, preliminary pathology or surgical pathology reports.

2. 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 (FFPE) tumor tissue block. Blocks prepared with alternative fixation methods may be acceptable; provide fixation method used.

Acceptable: Slides

Collection Instructions: Four consecutive, unstained, 5-micron-thick sections placed on positively charged slides, and 1 hematoxylin and eosin-stained slide.

Forms

If not ordering electronically, complete, print, and send 1 of the following forms with the specimen:

-Oncology Test Request (T729)

-Cardiovascular Test Request (T724)

Reject Due To

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

Specimen Minimum Volume

Two consecutive, unstained, 5-micron-thick sections placed on positively charged slides and 1 hematoxylin and eosin-stained slide

Specimen Stability Information

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

Clinical & Interpretive

Clinical Information

Synovial sarcoma (SS) is a malignant soft tissue tumor that predominantly occurs in the lower limbs of children and young adults. This tumor accounts for approximately 5% to 10% of soft tissue tumors, has a poor prognosis, and may occur in other areas of the body such as the head and neck, heart, abdominal wall, mediastinum, and lung, in addition to the extremities. Histologically, SS is grouped either into the monophasic subtype consisting of mostly spindle cells or the biphasic subtype consisting of epithelial and spindle cells. Depending on the site of origin, the differential diagnosis of SS can include mesothelioma, fibrosarcoma, solitary fibrous tumor, leiomyosarcoma, malignant peripheral nerve sheath tumors, epithelioid sarcoma, and clear cell sarcoma. In addition, when the SS is poorly differentiated, the differential diagnosis broadens to include the small round-blue cell tumors (Ewing sarcoma, alveolar rhabdomyosarcoma, and neuroblastoma). Accurate diagnosis of SS is important for appropriate clinical management of patients. Although immunohistochemical markers can be helpful in the correct diagnosis of these various tumor types, recent molecular studies have shown the superior specificity of molecular makers in differentiating SS from other tumors.

A recurrent, tumor-specific translocation t(X;18)(p11.2;q11.2) is observed in approximately 90% of synovial sarcomas. A single gene, *SS18 (SYT)*, has been implicated on 18q11.2, while 1 of 3 related genes, *SSX1, SSX2,* or infrequently *SSX4*, is usually involved on Xp11.2. The prevalence of *SS18-SSX1* is about twice that of *SS18-SSX2* in most studies. Detection of these transcripts is usually performed by reverse transcriptase-PCR (RT-PCR) (SYT / Synovial Sarcoma RT-PCR), which allows specific identification of *SS18-SSX1* or *SS18-SSX2.* Identification of the *SS18-SSX1* fusion is associated with an unfavorable outcome with significantly shorter overall survival when compared to the *SS18-SSX2* fusion. Unfortunately, RT-PCR results may be equivocal or falsely negative due to many reasons such as when the available RNA is of poor quality or if a rare translocation partner is present. In these cases, FISH testing can be used to identify *SS18* gene rearrangements in these tumors, which supports the diagnosis of SS.

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 cutoff for the *SS18* (*SYT*) FISH probe.

A positive result suggests rearrangement of the *SS18* (*SYT*) gene region at 18q11.2 and supports the diagnosis of synovial sarcoma (SS).

A negative result suggests no rearrangement of the *SS18* (*SYT*) gene region at 18q11.2. However, this result does not exclude the diagnosis of SS.

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) may not be successful for FISH assays; however, nonformalin-fixed samples will not be rejected.

Paraffin-embedded tissues that have been decalcified are generally unsuccessful for FISH analysis. The pathologist reviewing the hematoxylin and eosin-stained slide may find it necessary to cancel testing.

Supportive Data

FISH analysis was performed on 36 formalin-fixed, paraffin-embedded tissue samples including 14 synovial sarcoma (SS) tumors and 22 noncancerous control specimens or nonSS tumors. The normal controls were used to generate a normal cutoff for this assay. Using reverse transcriptase-PCR (RT-PCR) analysis, 11 SS tumors had the *SSX1* translocation partner and 3 tumors had the *SSX2* translocation partner. Rearrangement of *SS18* was identified in all 14 SS specimens with 10 exhibiting the expected signal pattern and 4 with an atypical signal pattern.

Clinical Reference

1. World Health Organization Classification of Tumours. Pathology and Genetics of Tumours of Soft Tissue and Bone. Edited by CDM Fletcher, K Unni, F Mertens. IARC: Lyon 2002, pp 200-204

2. Sandberg AA, Bridge JA: Updates on the cytogenetics and tissue tumors. Synovial sarcoma. Cancer Genet Cytogenet 2002 Feb;133(1):1-23

3. Kokovic I, Bracko M, Golouh R, et al: Are there geographical chimeric transcripts in synovial sarcoma? Cancer Detect Prev 2004;28(4):294-301

4. dos Santos NR, de Bruijn DR, van Kessel AG: Molecular mechanisms underlying human synovial sarcoma development. Genes Chromosomes Cancer 2001 Jan;30(1):1-14

Performance

Method Description

The test is performed using a commercially available *SS18* (*SYT)* dual-color break-apart strategy probe (BAP). Formalin-fixed, paraffin-embedded tissues are cut at 5 microns and mounted on positively charged glass slides. The selection of tissue and the target areas on the hematoxylin and eosin (H and E)-stained slide is performed by a pathologist. Using the H and E-stained slide as a reference, target areas are etched with a diamond-tipped etcher on the back of the unstained slide to be assayed. The probe set is hybridized to the appropriate target areas and 2 technologists each analyze 50 interphase nuclei (100 total) with the results expressed as the percent of abnormal nuclei.(Unpublished Mayo method)

PDF Report

No

Specimen Retention Time

Slides and H&E used for analysis are retained by the laboratory in accordance to CAP and NYS requirements. Client provided paraffin blocks and extra unstained slides (if provided) will be returned after testing is complete.

Performing Laboratory Location

Rochester

Fees & Codes

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 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)

LOINC® Information

Test ID	Test Order Name	Order LOINC Value
SS18F	SS18, Synovial Sarcoma, FISH, Ts	93810-0

Result ID	Reporting Name	LOINC®
52131	Result Summary	50397-9
52133	Interpretation	69965-2
54582	Result	62356-1
CG742	Reason for Referral	42349-1
52134	Specimen	31208-2
52135	Source	31208-2
52136	Tissue ID	80398-1
52137	Method	85069-3
55024	Additional Information	48767-8
52138	Released By	18771-6
53833	Disclaimer	62364-5