Test Definition: ESTUF

Endometrial Stromal Tumors (EST), 7p15 (JAZF1), 6p21.32 (PHF1), 17p13.3 (YWHAE) Rearrangement, FISH, Tissue

Overview

Useful For

Supporting the diagnosis of endometrial stromal tumors when used in conjunction with an anatomic pathology consultation

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 fluorescence in situ hybridization [FISH] probes). Additional charges will be incurred for all reflex or additional probe sets performed. No analysis charges will be incurred if an insufficient number of representative cells are available for analysis.

Unless otherwise indicated, the JAZF1 probe set will be performed initially. In the absence of a *JAZF1* rearrangement, reflex testing using the PHF1 probe set will be performed. In the absence of a *PHF1* rearrangement, reflex testing using the YWHAE probe set will be performed.

If FISH testing for a *JAZF1* rearrangement was previously performed, reflex testing using the YWHAE and/or PHF1 probe sets may be ordered separately. A copy of the JAZF1 FISH report is required for testing to be performed. If not provided, appropriate testing and interpretation may be compromised or delayed.

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, Oncology, and Hereditary Test Selection Guide

This test is **not intended for** male patients.

Additional Testing Requirements
Confirmation testing by next-generation sequencing to resolve atypical or unbalanced fluorescence in situ hybridization results of these gene regions is available, order SARCP / Sarcoma Targeted Gene Fusion/Rearrangement Panel, Next-Generation Sequencing, Tumor.

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.
-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
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
Specimen Type: Tissue slides

Slides: 1 Hematoxylin and eosin stained and 6 unstained
Collection Instructions: Submit 1 slide stained with hematoxylin and eosin and 6 consecutive unstained, positively-charged, unbaked slides with 5 micron-thick sections of the tumor tissue.

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 3 unstained

Reject Due To
All specimens will be evaluated by Mayo Clinic Laboratories for test suitability.

Specimen Stability Information

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

Clinical & Interpretive

Clinical Information
Endometrial stromal tumors (EST) arise from the uterus and include the benign endometrial stromal nodule (ESN) and infiltrative endometrial stromal sarcoma (ESS). Rearrangement of *JAZF1* occurs in approximately 75% of ESN and approximately 60% of ESS.

PHF1 is specific to ESS and can rearrange with both known and unknown partners in addition to *JAZF1*.

YWHAE rearrangements occur in high-grade ESS; JAZF1 and YWHAE rearrangements are mutually exclusive.

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 any given probe.

A positive result supports a diagnosis of an endometrial stromal tumor of various subtypes.

A negative result does not exclude the presence of a neoplastic disorder.

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.

Clinical Reference

1. WHO Classification of Tumours. Female Genital Tumours. 5th ed. IARC; 2020:286-288. WHO Classification of Tumours. Vol 4
2. Nomura Y, Tamura D, Horie M, et al. Detection of MEAF6-PHF1 translocation in an endometrial stromal nodule. Genes Chromosomes Cancer. 2020;59(12):702-708
3. Conklin CM, Longacre TA. Endometrial stromal tumors: the new WHO classification. Adv Anat Pathol. 2014;21(6):383-393
4. Antonescu CR, Kao YC, Xu B, et al. Undifferentiated round cell sarcoma with BCOR internal tandem duplications (ITD) or YWHAE fusions: a clinicopathologic and molecular study. Mod Pathol. 2020;33(9):1669-1677
5. O'Meara E, Stack D, Lee CH, et al. Characterization of the chromosomal translocation t (10; 17)(q22; p13) in clear cell sarcoma of kidney. J Pathol. 2012;227(1):72-80
6. Chiang S, Ali R, Melnyk N, et al. Frequency of known gene rearrangements in endometrial stromal tumors. Am J Surg Pathol. 2011;35(9):1364-1372
7. Lee CH, Marino-Enriquez A, Ou W, et al. The clinicopathologic features of YWHAE-FAM22 endometrial stromal sarcomas: A histologically high-grade and clinically aggressive tumor. Am J Surg Pathol. 2012;36(5):641-653
8. Panagopoulos I, Mertens F, Griffin CA, et al. An endometrial stromal sarcoma cell line with the JAZF1/PHF1 chimera. Cancer Genet Cytogenet. 2008;185(2):74-77
9. Lee CH, Ou WB, Marino-Enriquez A, et al. 14-3-3 fusion oncogenes in high-grade endometrial stromal sarcoma. Proc Natl Acad Sci U S A. 2012;109(3):929-934
10. Micci F, Panagopoulos I, Bjerkehagen B, et al. Consistent rearrangement of chromosomal band 6p21 with generation of fusion genes JAZF1/PHF1 and EPC1/PHF1 in endometrial stromal sarcoma. Cancer Res. 2006;66(1):107-112
11. Gebre-Medhin S, Nord KH, Moller E, et al. Recurrent rearrangement of the PHF1 gene in ossifying fibromyxoid tumors. Am J Pathol. 2012;181(3):1069-1077

Performance

Method Description

The test is performed using laboratory-developed dual-color break-apart strategy probes for *JAZF1, PHF1,* and *YWHAE.* 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 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
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)

LOINC® Information

MAYO CLINIC LABORATORIES

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Test ID	Test Order Name	Order LOINC® Value
ESTUF	Endometrial Stromal Tumor, FISH, Ts	102086-6

Result ID	Test Result Name	Result LOINC® Value
52147	Result Summary	50397-9
52149	Interpretation	69965-2
54584	Result	62356-1
CG744	Reason for Referral	42349-1
52150	Specimen	31208-2
52151	Source	31208-2
52152	Tissue ID	80398-1
52153	Method	85069-3
55026	Additional Information	48767-8
52154	Released By	18771-6
53831	Disclaimer	62364-5