

## Overview

### Useful For

Aiding in the diagnosis of myxoid/round cell liposarcoma by detecting a neoplastic clone associated with gene rearrangement involving the *DDIT3* (*CHOP*) gene region at 12q13

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

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

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charge.

**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 4 unstained

**Collection Instructions:** Submit 1 slide stained with hematoxylin and eosin and 4 consecutive, unstained, positively charged, unbaked slides with 5-micron-thick sections of the tumor tissue. Slides cut from blocks prepared with alternative fixation methods may be acceptable; provide fixation method used.

**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**

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		

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## Clinical & Interpretive

### Clinical Information

Myxoid/round cell liposarcoma is the second most common subtype of liposarcoma, accounting for more than one-third of all liposarcomas and representing about 10% of all adult soft-tissue sarcomas. Myxoid/round cell liposarcoma is described as a malignant tumor composed of uniform round to oval shaped primitive nonlipogenic mesenchymal cells and a variable number of small signet-ring lipoblasts in a prominent myxoid stroma with a characteristic branching vascular pattern.

A unique chromosome translocation,  $t(12;16)(q13;p11)$ , resulting in a fusion of the *DDIT3* gene (also known as *CHOP* or *GADD153*) on chromosome 12 and the *FUS* gene (also referred to as *TLS*) on chromosome 16, is the key genetic aberration in myxoid/round cell liposarcoma. More than 90% of myxoid/round cell liposarcoma are cytogenetically characterized by this translocation. In rare cases, a variant  $t(12;22)(q13;q12)$  has been described in which *DDIT3* (*CHOP*) fuses with *EWS*, a gene highly related to *FUS*.

### 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 DDIT3 (CHOP) probe set.

A positive result is consistent with a subset of myxoid/round cell liposarcoma.

A negative result suggests no rearrangement of the *DDIT3* (*CHOP*) gene region is present but does not exclude the diagnosis of myxoid/round cell liposarcoma.

### Cautions

This test is not approved by the US Food and Drug Administration, and it 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 Editorial Board. Soft Tissue and Bone. 5th ed. IARC; 2020:42-44. World Health Organization Classification of Tumours. Vol 3
2. Meis-Kindblom JM, Sjogren H, Kindblom LG, et al. Cytogenetic and molecular genetic analyses of liposarcoma and its soft tissue simulators: recognition of new variants and differential diagnosis. *Virchows Arch.* 2001;439(2):141-51

3. Rabbitts TH, Forster A, Larson R, et al. Fusion of the dominant negative transcription regulator CHOP with a novel gene FUS by translocation t(12;16) in malignant liposarcoma. *Nat Genet.* 1993;4(2):175-180
4. Sandberg AA. Updates on the cytogenetics and molecular genetics of bone and soft tissue tumors: liposarcoma. *Cancer Genet Cytogenet.* 2004;155(1):1-24
5. Downs-Kelly E, Goldblum JR, Patel RM, et al. The utility of fluorescence in situ hybridization (FISH) in the diagnosis of myxoid soft tissue neoplasms. *Am J Surg Pathol.* 2008;32:8-13

## Performance

### Method Description

The test is performed using a commercially available DDIT3 (CHOP) dual-color, break-apart strategy probe. 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. 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

### 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)
- 88271-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
DDITF	DDIT3, Myxoid Liposarcoma, FISH, Ts	101379-6

Result ID	Test Result Name	Result LOINC® Value
52155	Result Summary	50397-9
52157	Interpretation	69965-2
54585	Result	62356-1
CG745	Reason for Referral	42349-1
52158	Specimen	31208-2
52159	Source	31208-2
52160	Tissue ID	80398-1
52161	Method	85069-3
55027	Additional Information	48767-8
52162	Released By	18771-6
53830	Disclaimer	62364-5