MAYO CLINIC LABORATORIES

Test Definition: JGLIF

1p/19q Glioma Deletions, FISH, Tissue

Overview

Useful For
Glioma subclassification, prognosis and selection of therapies

Testing Algorithm
This test includes a charge for application of 2 probe sets (4 individual fluorescence in situ hybridization probes), analysis, and professional interpretation of results.

Method Name
Fluorescence In Situ Hybridization (FISH)

NY State Available
No

Specimen

Specimen Type
Tissue

Ordering Guidance
To evaluate for acquired alterations associated with the molecular classification of glioma, chromosomal microarray rather than fluorescence in situ hybridization may be of benefit, order CMAPT / Chromosomal Microarray, Tumor, Formalin-Fixed Paraffin-Embedded.(1)

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

Ship paraffin blocks on ice packs during warm months.

Necessary Information
A reason for testing and pathology report are required for testing to be performed. Send information with specimen. Acceptable pathology reports include working drafts, preliminary pathology, or surgical pathology reports.

Specimen Required
Submit only 1 of the following specimens:

Preferred
Specimen Type: Tissue block
Collection Instructions:
1. Submit a formalin-fixed, paraffin-embedded tumor tissue block.
2. Provide fixation method used.

Additional Information: Blocks prepared with alternative fixation methods **will not** be accepted.

Acceptable
Specimen Type: Tissue slides
Slides: 1 hematoxylin and eosin-stained and 3 unstained
Collection Instructions:
1. Submit 1 slide stained with hematoxylin and eosin and 3 consecutive, unstained, positively charged, unbaked, slides with 4 to 5 micron-thick sections of the tumor tissue.
2. Provide fixation method used.
Additional Information: Slides cut from blocks prepared with alternative fixation methods **will not** be accepted.

Specimen Minimum Volume

Tissue slides: 2 consecutive unstained and 1 hematoxylin and eosin stained

Reject Due To

Decalcified specimens	Reject

Specimen Stability Information

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

Clinical & Interpretive

Clinical Information

Chromosome 1p/19q co-deletion is a diagnostic and prognostic marker of oligodendroglioma. Studies have shown that the co-deletion of these 2 chromosomal arms is due to a balanced whole arm translocation between chromosomes 1 and 19 and subsequent loss of the 1p and 19q arms. Detection of 1p/19q co-deletion along with molecular testing of other genes including *MGMT* promotor methylation, *IDH*1/2 variant, *TERT* promotor variants, as well as *TP53* variants, will assist glioma classification and predicting prognosis and providing a guidance for treatment. Variants in many other genes may occur and detection of these by next generation sequencing may provide useful information for classification and therapeutic consideration.

1p/19q co-deletion is determined by fluorescence in situ hybridization (FISH) in this test. Interpretation of the clinical significance of the FISH result should be correlated with the results of other molecular testing for disease subclassification and therapy selection. While *IDH*1/2 variants with co-deletion of 1p and 19q define oligodendrogliomas, isolated 19q loss is common in astrocytomas and focal loss of 1p frequently is seen in IDH-wild-type glioblastoma. Rarely, a 1p/19q co-deletion detected by FISH may not represent loss of the whole chromosome 1p and 19q arms. If a positive FISH result is not consistent with the disease subclassification, additional tests such as chromosome microarray should be considered to confirm presence of 1p/19q whole arm loss.

Reference Values
An interpretive report will be provided.

Interpretation
While *IDH*1/2 variants with co-deletion of 1p and 19q define oligodendrogliomas, isolated 19q loss is common in astrocytomas and focal loss of 1p frequently is seen in IDH wildtype glioblastoma. Interpretation of the fluorescence in situ hybridization result must be correlated with other molecular testing results.

Cautions
Optimum fixation is performed in 10% neutral buffered formalin. Other types of fixatives should not be used.

The information provided by the 1p/19q status of a patient's tumor should not be interpreted in isolation.

Clinical Reference
1. Eckel Passow JE, Lachance DH, Molinaro AM, et al. Glioma Groups Based on 1p/19q, IDH, and TERT Promoter Mutations in Tumors. N Engl J Med. 2015;372(26):2499-2508
2. Weller M, Wick W, Aldape K, et al. Glioma. Nat Rev Dis Primers. 2015;1:15017
3. Reifenberger G, Wirsching HG, Knobbe-Thomsen CB, Weller M. Advances in the molecular genetics of gliomas implications for classification and therapy. Nat Rev Clin Oncol. 2017;14(7):434-452
4. Chen R, Smith-Cohn M, Cohen AL, Colman H. Glioma Subclassifications and Their Clinical Significance. Neurotherapeutics. 2017;14(2):284-297
5. Nicholson JG, Fine HA. Diffuse Glioma Heterogeneity and Its Therapeutic Implications. Cancer Discov. 2021;11(3):575-590
6. Galbraith K, Snuderl M. Molecular Pathology of Gliomas. Surg Pathol Clin. 2021;14(3):379-386

Performance

Method Description
The test uses 2 commercially available enumeration strategy probe sets: 1p36(*TP73*)/1q25(*ABL2*) and 19p13(D19S221)/19q13.3(*EHD2*). Formalin-fixed paraffin-embedded tissues cut at 4 to 5 microns and mounted on positively charged glass slides are used. The selection of tissue and the identification of 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 sets are hybridized to the appropriate target areas. For each probe set, 2 technologists each analyze 50 interphase nuclei (100 total for each probe set) with the results expressed as a ratio of the total number of 1p36:1q and 19q13.3:19p signals.(Unpublished Mayo method)

PDF Report
No

Day(s) Performed
Monday through Friday

Report Available

2 to 8 days

Specimen Retention Time

Images are saved indefinitely. Extra unstained slides (if provided) and hematoxylin and eosin-stained slide will be sent to histology after testing is complete.

Performing Laboratory Location

Mayo Clinic Jacksonville Clinical Lab

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 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

88377 x 2 (2 probe sets)

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
JGLIF	1p/19q Deletion, Glioma, FISH, Tis	107239-6

Result ID	Test Result Name	Result LOINC® Value
606667	Result Summary	50397-9
606668	Interpretation	69965-2
606669	Result	62356-1
606670	Reason for Referral	42349-1
606671	Specimen	31208-2
606672	Source	85298-8
606673	Tissue ID	80398-1
606674	Fixative	8100-0
606675	Method	85069-3
606676	Additional Information	48767-8
606677	Disclaimer	62364-5
606678	Released By	18771-6