ARUP LABORATORIES | **aruplab.com**
500 Chipeta Way, Salt Lake City, Utah 84108-1221
phone: 801-583-2787, toll free: 800-522-2787
Julio Delgado, MD, MS, Chief Medical Officer

Client: Example Client ABC123
123 Test Drive
Salt Lake City, UT 84108
UNITED STATES

Physician: Doctor, Example

Patient: Patient, Example

DOB	12/31/1959
Gender:	Female
Patient Identifiers:	01234567890ABCD, 012345
Visit Number (FIN):	01234567890ABCD
Collection Date:	00/00/0000 00:00

1p19q Deletion by FISH and IDH1 R132H Point Mutation by Immunohistochemistry with Reflex to IDH1 and IDH2 Mutation Analysis, Exon 4

ARUP test code 3002135

Block ID	SP20-1234
IDH1 R132H Point Mut by IHC with Reflex	Negative

IDH1 by immunohistochemistry is negative. IDH1 and IDH2 Mutation Analysis has been added and will be reported separately.

This result has been reviewed and approved by Cheryl A. Palmer, M.D.
Controls stained appropriately.

INTERPRETIVE INFORMATION: IDH1 R132H Point Mut by IHC with Reflex
IDH1 R132H Point Mutation by Immunohistochemistry detects the presence of mutant IDH1 R132H protein expression in diffuse gliomas and can serve as a screening tool for molecular testing. A positive result indicates a probable IDH1 R132H mutation. A negative result indicates the tumor has no R132H mutation, which will automatically reflex to IDH1 and IDH2 gene sequencing, to detect less common IDH1 or IDH2 mutations not detected by the IHC test. This test is performed on paraffin-embedded, formalin-fixed tissue.

Controls were run and performed as expected.

Test developed and characteristics determined by ARUP Laboratories. See Compliance Statement B: aruplab.com/CS

1p/19q Deletion by FISH

ARUP test code 3001309

1p Result	Not Deleted
19q Result	Not Deleted

H=High, L=Low, *=Abnormal, C=Critical

Controls were run and performed as expected.
This result has been reviewed and approved by Christian J. Davidson, M.D.
2000 Circle of Hope, RM 3100
Salt Lake City, UT 84112

METHODOLOGY AND TEST INFORMATION:

Fluorescence in situ hybridization (FISH) analysis was performed on a section from a paraffin embedded tissue block using differentially labeled fluorescent probes targeting 1p36/1q25 and 19p13/19q13 (Abbott Molecular). Cells were evaluated from regions of tumor identified on histopathologic review of a matching hematoxylin and eosin stained section. Controls performed appropriately.

This assay evaluates the average ratios of 1p to 1q and 19q to 19p, as well as the percentage of cells with a signal pattern consistent with a deletion (individual cell 1p/1q and 19q/19p ratios of 0.5 or lower). Based on the validation of this assay, 1p deletion is defined as a 1p/1q ratio below 0.80 combined with a deleted pattern in 24 percent or more of the scored cells, and 19q deletion is defined as a 19q/19p ratio below 0.80 combined with a deleted pattern in 26 percent or more of the scored cells.

Co-deletion of 1p and 19q as the result of an unbalanced translocation is characteristic of oligodendrogliomas and a diagnostic feature according to the WHO Classification of Tumours of the Central Nervous System, Revised 4th Edition (2016). Co-deletion is also predictive of a favorable response to combination chemotherapy. Isolated deletions of 1p or 19q are neither diagnostic nor predictive in a similar fashion. Polysomy, defined in this context as three or more signals for 1q and/or 19p in 30 percent or more of the tumor cells, suggests a less-favorable outcome in oligodendrogliomas. Correlation with other laboratory data, especially histopathologic findings, is recommended for optimal risk stratification.

References:
1. Jenkins RB et al. A t(1;19)(q10;p10) Mediates the Combined Deletions of 1p and 19q and Predicts a Better Prognosis of Patients with Oligodendroglioma. Cancer Res 66 (20): 9852-9861, 2006.
2. Snuderl M et al. Polysomy for chromosomes 1 and 19 predicts earlier recurrence in anaplastic oligodendrogliomas with concurrent 1p/19q loss. Clin Cancer Res 15(20):6430-6437, 2009.
3. Wiens et al. Polysomy of chromosomes 1 and/or 19 is common and associated with less favorable clinical outcome in oligodendrogliomas: fluorescent in situ hybridization analysis of 84 consecutive cases. J Neuropathol Exp Neurol 71(7):618-624, 2012.
4. Clark K et al. How molecular testing can help (and hurt) in the workup of gliomas. Am J Clin Pathol 139(3):275-288, 2013.
5. Senetta R et al. A "weighted" fluorescence in situ hybridization strengthens the favorable prognostic value of 1p/19q codeletion in pure and mixed oligodendroglial tumors. J Neuropathol Exp Neurol 72(5):432-41, 2013.
6. Eckel-Passow JE et al. Glioma Groups Based on 1p/19q, IDH, and TERT Promoter Mutations in Tumors. N Engl J Med 25;372(26):2499-508, 2015.
7. Louis DN, Ohgaki H, Wiestler OD, Cavenee WK, Ellison DW, Figarella-Branger D, Perry A, Reifenberger G, von Deimling A, Eds. WHO Classification of Tumours of the Central Nervous System, Revised 4th Edition. Lyon, France: International Agency for Research on Cancer, 2016.

Test developed and characteristics determined by ARUP Laboratories. See Compliance Statement A: aruplab.com/CS.

H=High, L=Low, *=Abnormal, C=Critical

1p/1q Ratio	1.00
Chromosome 1 Polysomy	Not Detected
19q/19p Ratio	1.00
Chromosome 19 Polysomy	Not Detected
1p19q FISH Reference Number	SP20-1234
1p19q FISH Source	Brain
Total Cell Count	100
Scoring Method	Manual

H=High, L=Low, *=Abnormal, C=Critical

VERIFIED/REPORTED DATES

Procedure	Accession	Collected	Received	Verified/Reported
Block ID	20-209-116134	00/00/0000 00:00	00/00/0000 00:00	00/00/0000 00:00
1p Result	20-209-116134	00/00/0000 00:00	00/00/0000 00:00	00/00/0000 00:00
19q Result	20-209-116134	00/00/0000 00:00	00/00/0000 00:00	00/00/0000 00:00
1p/1q Ratio	20-209-116134	00/00/0000 00:00	00/00/0000 00:00	00/00/0000 00:00
Chromosome 1 Polysomy	20-209-116134	00/00/0000 00:00	00/00/0000 00:00	00/00/0000 00:00
19q/19p Ratio	20-209-116134	00/00/0000 00:00	00/00/0000 00:00	00/00/0000 00:00
Chromosome 19 Polysomy	20-209-116134	00/00/0000 00:00	00/00/0000 00:00	00/00/0000 00:00
1p19q FISH Reference Number	20-209-116134	00/00/0000 00:00	00/00/0000 00:00	00/00/0000 00:00
1p19q FISH Source	20-209-116134	00/00/0000 00:00	00/00/0000 00:00	00/00/0000 00:00
Total Cell Count	20-209-116134	00/00/0000 00:00	00/00/0000 00:00	00/00/0000 00:00
Scoring Method	20-209-116134	00/00/0000 00:00	00/00/0000 00:00	00/00/0000 00:00
IDH1 R132H Point Mut by IHC with Reflex	20-209-116134	00/00/0000 00:00	00/00/0000 00:00	00/00/0000 00:00

END OF CHART