Name	: ECHS000006170652 MOHINDER SINGH	Age	: 70 Years
Lab No.	: 469302053	Gender	: Male
Ref By	: BRIG AMUL KAPOOR	Reported	: 4/5/2024 5:11:42PM
Collected	: 20/4/2024 12:40:00PM	Report Status	: Final
A/c Status	: P	Processed at	: LPL-NATIONAL REFERENCE LAB National Reference laboratory, Block E, Sector 18, Rohini, New Delhi -110085
Collected at	: ARMY HOSPITAL (R & R)		

Test Report

Test Name	Results	Units	Bio. Ref. Interval
LUNGCANCER 12 GENE PANEL WITH PD-L1 (22C3 - DAKO)			
LUNG CANCER 12 GENE PANEL (Next Generation Sequencing)	Result Attached		

Dr Rajiv Tangri
MD, Pathology
Technical Director - Histopathology and Cytopathology - NRL

Dr Richa Nathani
MD,Pathology, PDF(Molecular)
Consultant Molecular Pathologist
NRL - Dr Lal PathLabs Ltd

Dr Vamshi Krishna Thamtam
MCI - 17-25915
MBBS, MD Pathology
DipRCPath UK, Molecular Genetics
Fellowship, Tata Medical Center
Head - Genomics & Clinical Cytogenomics
NRL - Dr Lal PathLabs Ltd

----------End of report ----------

IMPORTANT INSTRUCTIONS

•Test results released pertain to the specimen submitted.•All test results are dependent on the quality of the sample received by the Laboratory.•Laboratory investigations are only a tool to facilitate in arriving at a diagnosis and should be clinically correlated by the Referring Physician .•Report delivery may be delayed due to unforeseen circumstances. Inconvenience is regretted.•Certain tests may require further testing at additional cost for derivation of exact value. Kindly submit request within 72 hours post reporting.•Test results may show interlaboratory variations.•The Courts/Forum at Delhi shall have exclusive jurisdiction in all disputes/claims concerning the test(s) & or results of test(s).•Test results are not valid for medico legal purposes.•This is computer generated medical diagnostic report that has been validated by Authorized Medical Practitioner /Doctor.•The report does not need physical signature.

(#) Sample drawn from outside source.

If Test results are alarming or unexpected, client is advised to contact the Customer Care immediately for possible remedial action.

Tel: +91-11-49885050,Fax: - +91-11-2788-2134, E-mail: lalpathlabs@lalpathlabs.com

National Reference lab, Delhi, a CAP (7171001) Accredited, ISO 9001:2015 (FS60411) & ISO 27001:2013 (616691) Certified laboratory.

Regd. Office: Dr Lal PathLabs Ltd, Block E, Sector-18, Rohini, New Delhi-110085
Web: www.lalpathlabs.com, CIN: L74899DL1995PLC065388

GENEVOLVE Dr Lal PathLabs

Dr Lal PathLabs OncoPro

DEMOGRAPHICS	NAME	ECHS000006170652 MOHINDER SINGH
	AGE/SEX	70 YEARS / MALE
	LAB NO.	469302053
	COLLECTED AT	ARMY HOSPITAL (R & R)
	REFERRED BY	BRIG AMUL KAPOOR
	REPORTING CENTRE	LPL-NRL, DELHI
	RECEIVING DATE	23/APR/2024
	REPORTING DATE	04/MAY/2024

TEST PERFORMED	LUNG CANCER 12 GENE PANEL (Z1122)
METHOD	NEXT GENERATION SEQUENCING

CLINICAL INDICATION	70-years-old male diagnosed with Metastatic Adenocarcinoma (Lung primary) in Liver SOL biopsy.		
FFPE TISSUE No.	B/2561/24	TUMOUR CELLULARITY	~30%

KEY FINDINGS	Gene Mutation	DETECTED
	Gene Fusion	NOT DETECTED
	Gene Amplification	INDETERMINATE

INTERPRETATION SUMMARY	DNA Mutation: Missense variant detected in exon 2 of KRAS gene (NM_033360.4):c.34G>A;p.Gly12Ser with VAF ~4%
	RNA Fusion: No clinically significant fusion identified.

VARIANT CLASSIFICATION				
Variant	ClinVar	Varsome	COSMIC	Others
KRAS p.Gly12Asp	Pathogenic	Pathogenic	COSM517	-

*Kindly Note: The variant KRAS (NM_033360.4):c.34G>A;p.Gly12Ser detected near the detection limit of the assay. It is recommended to confirm the variant with alternative technology before taking any therapeutic decision.
*The QC parameters for this sample were sub optimal, possibly due to fixation/embedding artefacts.

Classification: Restricted

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Variant Summary

GENE (EXON) [TRANSCRIPT]	VARIANT INFORMATION				CLASSIFICATION (AMP/ASCO/CAP)
	Amino Acid Alteration	Coding DNA Alteration	Variant Allele Frequency	Coverage	
KRAS (2) [NM_033360.4]	p.Gly12Ser	c.34G>A	~ 4%	650x	Tier-II
EGFR	No clinically significant Variant detected				
PIK3CA	No clinically significant Variant detected				
ALK	No clinically significant Variant detected				
MAP2K1	No clinically significant Variant detected				
MET	No clinically significant Variant detected				
NRAS	No clinically significant Variant detected				
BRAF	No clinically significant Variant detected				
ROS1	No clinically significant Variant detected				
ERBB2	No clinically significant Variant detected				

Variant Fusions

Gene	Fusion Partner	Variant	Read Count	Read Count per million
ALK	No clinically significant Fusion detected			
ROS1	No clinically significant Fusion detected			
RET	No clinically significant Fusion detected			
NTRK1/2/3	No clinically significant Fusion detected			

Exon skipping Mutation

Gene	Variant
MET	MET(13)::MET(15) Not Detected

Gene Amplification

Gene	Copy Number (NGS)
MET	Indeterminate

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NCCN
Guidelines Version 2.2024
Non-Small Cell Lung Cancer

National Comprehensive Cancer Network®

NCCN Guidelines Version 2.2024
Non-Small Cell Lung Cancer

NCCN Guidelines Index
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PD-L1 ≥50% First-line Therapy

PD-L1 ≥1%–49% First-line Therapy

a) Monitoring During Initial Therapy: Response assessment after 2 cycles, then every 2–4 cycles with CT of known or high-risk sites of disease with or without contrast or when clinically indicated. Timing of CT scans within Guidelines parameters is a clinical decision.
b) Monitoring During Subsequent Therapy or Maintenance Therapy: Response assessment with CT of known or high-risk sites of disease with or without contrast every 6–12 weeks. Timing of CT scans within Guidelines parameters is a clinical decision.
c) An FDA-approved biosimilar is an appropriate substitute for bevacizumab.
d) For agents with a similar mechanism of action, it is not recommended to switch between these drugs at the time of progression.

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CLINICAL TRIAL INFORMATION

NCT Number	Title	Conditions	Interventions	Start Date	Completion Date
NCT04742556	A Study to Test Different Doses of BI 3011441 in Japanese People With Different Types of Advanced Cancer (NRAS/KRAS Mutation Positive)	Solid Tumors, KRAS Mutation	Drug: BI 3011441	March 15, 2021	October 27, 2023
NCT04835714	A Study to Find a Safe and Effective Dose of BI 1701963 Alone and in Combination With BI 3011441 in Patients With Advanced Cancer and a Certain Mutation (Kirsten Rat Sarcoma Viral Oncogene Homologue [KRAS])	Solid Tumors, KRAS Mutation	Drug: BI 1701963|Drug: BI 3011441	April 20, 2021	September 19, 2023
NCT04620330	A Study of VS-6766 v. VS-6766 + Defactinib in Recurrent G12V or Other KRAS-Mutant Non-Small Cell Lung Cancer	Non-Small Cell Lung Cancer|KRAS Activating Mutation	Drug: VS-6766|Drug: VS-6766 and Defactinib	December 31, 2020	Dec-2025

CTRI No.	Public Title	Type of Trial	Health Condition	Intervention Name
No CTRI record is available for detected mutation				

For further updated information about clinical trial, please visit the link: https://clinicaltrials.gov/; http://ctri.nic.in/Clinicaltrials/advancesearchmain.php

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Tier Based Classification (AMP/ASCO/CAP)

Tier I: Variants of Strong Clinical Significance Therapeutic, Prognostic & Diagnostic Relevance	Tier II: Variants of Potential Clinical Significance Therapeutic, Prognostic & Diagnostic Relevance	Tier III: Variants of Unknown Clinical Significance	Tier IV: Benign or Likely Benign Variants
Level A Evidence FDA-approved therapy included in professional guidelines	Level C Evidence FDA-approved therapies for different tumor types or investigational therapies Multiple small published studies with some consensus	Not observed at a significant allele frequency in the general or specific subpopulation databases, or pan-cancer or tumor-specific variant databases No convincing published evidence of cancer association	Observed at significant allele frequency in the general or specific subpopulation databases No existing published evidence of cancer association
Level B Evidence Well-powered studies with consensus from experts in the field	Level D Evidence Preclinical trials or a few case reports without consensus		

METHODS

This assay targets 12 genes and uses Next generation sequencing to interrogate DNA hotspot mutations, RNA fusions as well as CNVs. These genes have been selected on the basis of their known impact as actionable targets of existing and emerging anti-cancer therapies, and the prognostic features in specific tumor types. (Recent NCCN & ESMO Guidelines)
The sensitivity of the assays depends on the quality of the FFPE block, and it's tumor cellularity. In validation studies using control material and a variety of cell lines including patient samples the minimum analytic detection limit for each of the assays is 5% (VAF).
This is a lab developed test and is not yet FDA approved.
Genomic co-ordinates are checked in reference to the GRCh37 (hg19) assembly of the human genome.

LIMITATIONS

The accuracy and completeness of this information may vary due to variable information available in different databases. Variants with allele frequency at nearly 50% or 100% may be a Germline mutation. However, to rule out germ line mutations, whole blood / Saliva sample is recommended to be processed. Synonymous mutations are not reported. UDG treatment has not been performed. The mutations may need to be confirmed using Sanger sequencing and/or alternate technologies and additional testing might be required if clinically indicated. False negative results may be due to sampling error/errors in tissue processing/fixation/embedding or if the tumor cellularity is lower than 10%.

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DISCLAIMER

This report provides information about the patient's mutations that may aid the physician's decision making process, but this test should not be the sole source of information for making decisions on patient care and treatment. These tests should be interpreted in the context of standard clinical, laboratory, and pathological findings. Identification of a mutation in one or more of these genes does not guarantee activity of the drug in a given indication.

The information provided in this report was collected from various sources that we believe to be reliable and quality control procedures have been put in place to ensure the information provided is as accurate, comprehensive, and current as possible. The information provided should only be utilized as a guide or aid and the decision to select any therapy option based on the information reported here resides solely with the discretion of the treating physician. Patient care and treatment decisions should only be made by the physician after taking into account all relevant information available including but not limited to the patient's condition, family history, findings upon examination, results of other diagnostic tests, and the current standards of care. This report should only be used as an aid and the physician should employ clinical judgment in arriving at any decision for patient care or treatment.

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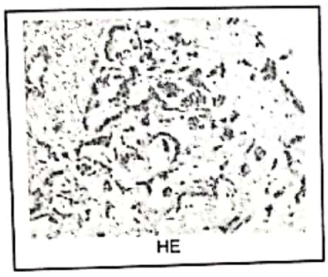
MD, (Pathology), PDF(Molecular)
Consultant Molecular Pathologist
NRL - Dr Lal PathLabs Ltd

Name	: ECHS000006170652 MOHINDER SINGH	Age	: 70 Years
Lab No.	: 469302053	Gender	: Male
Ref by	: BRIG AMUL KAPOOR	Reported	: 24/04/2024 13:00:57
Collected	: 20-04-2024 12:40:00	Report Status	: Final
A/c Status	: P		
Collected at	: ARMY HOSPITAL (R & R)	Processed at	: LPL-NATIONAL REFERENCE LAB National Reference laboratory, Block E, Sector 18, Rohini, New Delhi -110085

SURGICAL PATHOLOGY REPORT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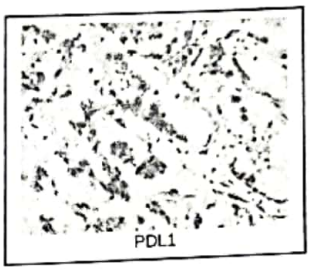
PDL1

PD-L1 IHC 22C3

SLIDE NO	:	B/ 141684/24
SPECIMEN	:	Block of trucut biopsy liver SOL.
CLINICAL HISTORY	:	Carcinoma lung with metastasis to liver.
GROSS	:	Received 1 formalin fixed paraffin embedded block labelled as B/2561/24
MICROSCOPY	:	**Tumour histologic type : Metastatic Adenocarcinoma.** **Adequate tumour cells (≥100 cells) present : Yes.**

Test	Result	Interpretation
PD-L1 22C3 (DAKO)	Tumour proportion score: **1 to 3**	PD-L1 expression (TPS 1-49)

Comment : *All external controls show appropriate reactivity.*

INTERPRETATIVE COMMENTS

Use
Identification of neoplasms expressing programmed cell death - ligand 1 (clone 22C3)

Classification: Internal
Note: 1. Slides / Blocks can be issued only on advise of the referring consultant after a minimum of 48 hours.
2. Gross specimens will be retained only for a period of 1 month after the date of reporting.
3. Contact histopathology department for any clarification.

Name	: ECHS000006170652 MOHINDER SINGH	Age	: 70 Years
Lab No.	: 469302053	Gender	: Male
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Background

PD-L1 is a transmembrane protein that down-regulates immune responses through binding to its two inhibitory receptors, PD-1 and B7.1. PD-1 is an inhibitory receptor expressed on T cells following T-cell activation, which is sustained in states of chronic stimulation such as in chronic infection or cancer. 'Ligation of PD-L1 with PD-1 inhibits T-cell proliferation, leading to inactivation or T-cells. Aberrant expression of PD-L1 on tumor cells has been reported to impede anti-tumor immunity, resulting in immune evasion. Therefore, interruption of the PDL1/PD-1 pathway represents an attractive therapeutic strategy in treatment of various tumors.

Clinical Utility

PD-L1 22C3 assay is indicated as a **Companion Diagnostic** aid in identifying patient for treatment with **KEYTRUDA (pembrolizumab)** therapy in following tumors

- Non-small cell Lung carcinoma (NSCLC)
- gastric or gastroesophageal junction adenocarcinoma
- Cervical carcinoma
- Urothelial carcinoma
- Head and neck squamous cell carcinoma (HNSCC)
- Esophageal squamous cell carcinoma (ESCC)

Interpretation

Results are reported as TPS (Tumor proportion score) or CPS (Combined positive score).

- **TPS (Tumor proportion score):** Percentage of viable tumor cells showing partial or complete membrane staining of any intensity relative to all viable tumor cells present in the sample
- **CPS (Combined positive score):** Number of PD-L1 staining cells (tumor cells, lymphocytes, macrophages) divided by the total viable tumor cells, multiplied by 100.

TUMOR	SCORING USED	INTERPRETATION GUIDELINES
NSCLC	TPS	TPS ≥ 50% - High PD-L1 expression TPS 1-49% - PD-L1 expression TPS < 1% - No PD-L1 expression
Other sites	CPS	CPS ≥1 - PD-L1 expression CPS < 1 - No PD-L1 expression

NOTE :

1. Type of specimen Fixation & processing - Formalin fixed paraffin embedded tissue.
2. Detection system used is Polymer HRP
3. Clones for antibodies are as under:
   PDL1 22C3 DAKO
4. The impression is based on the material submitted and is not a complete surgical pathology report.

Classification: Internal
Note: 1. Slides / Blocks can be issued only on advise of the referring consultant after a minimum of 48 hours.
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Collected at	: ARMY HOSPITAL (R & R)		

5. False negative IHC results due to inadequate fixation of the material sent for evaluation cannot be excluded.

FIXATION REQUIREMENTS :

- The volume of formalin fixative should be atleast 10 times the volume of the specimen.
- Decalcification solutions with strong acids should not be used.
- Specimens should be immersed in fixative within 1 hour of the biopsy/resection procedure (time of removal & time of immersion to be mentioned).
- No validation studies have been performed regarding PD-L1 IHC staining for Cell blocks prepared from body fluids initially fixed in alcohol based fixatives.
- In all resection (large) specimens, the tumour must be bisected prior to immersion in fixative.

HISTOPATH NO : [LPL/B/141684/24 :]

DMC-5141
Dr Rajiv Tangri
MD, Pathology
Technical Director - Histopathology and Cytopathology - NRL

Note: Case reported by Dr Rajiv Tangri

IMPORTANT INSTRUCTIONS

•Test results released pertain to the specimen submitted. •All test results are dependent on the quality of the sample received by the Laboratory. •Laboratory investigations are only a tool to facilitate in arriving at a diagnosis and should be clinically correlated by the Referring Physician. •Sample repeats are accepted on request of Referring Physician within 7 days post reporting. •Report delivery may be delayed due to unforeseen circumstances. Inconvenience is regretted. •Certain tests may require further testing at additional cost for derivation of exact value. Kindly submit request within 72 hours post reporting. •Test results may show interlaboratory variations. •The Courts/Forum at Delhi shall have exclusive jurisdiction in all disputes/claims concerning the test(s) & or results of test(s). •Test results are not valid for medico legal purposes. • This is computer generated medical diagnostic report that has been validated by Authorized Medical Practitioner /Doctor. The report does not need physical signature.
(#) Sample drawn from outside source.
If Test results are alarming or unexpected, client is advised to contact the Customer Care immediately for possible remedial action.
Tel: +91-11-49885050,Fax: - +91-11-2788-2134, E-mail: lalpathlabs@lalpathlabs.com

Classification: Internal
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