Patient Name:	Mr.Irfan	Ref Hospital:	-
Age/Gender:	75Y/Male	Received date:	30-04-2024
Test name:	EGFR mutational analysis by RT PCR	Reported date:	11-05-2024

Department of Molecular Oncology

Result: NEGATIVE FOR TARGETED *EGFR* GENE MUTATIONS.

Gene	Exons assessed	No of mutations	Mutation type	Patient Mutation status
EGFR	18	3	SNP	Not detected (Wild type)
	19	19	Deletions	Not detected (Wild type)
	20	5	3 Insertions	Not detected (Wild type)
			2 SNPs	Not detected (Wild type)
	21	2	SNPs	Not detected (Wild type)

Interpretation: The test was performed on exon 18,19,20 and 21 of the EGFR gene covering a total of 29 hotspots across the four exons (refer appendix table). The tested Patient sample is **NEGATIVE** for mutations screened in the 4 exons of the EGFR gene.

Sample type: FFPE Block (210/23)

Tumor volume: 40%.

Indications for testing: This test is intended to determine eligibility and potential for response to EGFR-targeted tyrosine kinase inhibitors in non-small cell lung cancer (NSCLC) patients.

Recommendations: These findings should be correlated with other clinical and laboratory tests for a definite conclusive interpretation.

Methodology: DNA was extracted from FFPE tissue block using Qiagen kits and the extracted DNA was used for the qualitative detection of 29 somatic mutations in the EGFR cancer-related gene using the polymerase chain reaction (PCR) by Thera screen EGFR RGQ PCR Kit.

Background: Lung cancer is associated with pathogenic variants in the *EGFR* gene, which encodes the epidermal growth factor receptor that acts through a tyrosine kinase pathway leading to cellular proliferation. Somatic mutations in the *EGFR* gene are associated with lung cancer, and individuals with lung cancer may respond to tyrosine kinase inhibitors (Ramalingam et al. 2011). EGFR, when mutated plays a role in tumor growth and proliferation and is the target for Tyrosine Kinase Inhibitors (TKI) such as Gefitinib, Erlotinib and Osimertinib. Clinical studies have found that upto 20% of NSCLC tumors harbor certain somatic mutations in the EGFR gene. Majority of these mutations are located in exons 18 to 21.

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Comments:

Test results must be interpreted in the context of clinical findings, tumor sampling, and other laboratory data. If there is clinical discordance, please contact the laboratory for possible interpretation. Misinterpretation of results may occur if the clinical history and other information provided is inaccurate or incomplete.

Accuracy of results depends on adequate specimen collection and processing Improper fixation of and treatment of tissues, such as decalcification, may cause polymerase chain reaction failure.

References:

- Ramalingam SS, Owonikoko TK, Khuri FR. Lung cancer: New biological insights and recent therapeutic advances. CA Cancer J Clin. 2011 Mar-Apr;61(2):91-112. doi: 10.3322/caac.20102. Epub 2011 Feb 8. PMID: 21303969.
- Hsu WH, Yang JC, Mok TS, Loong HH. Overview of current systemic management of EGFR-mutant NSCLC. Ann Oncol. 2018 Jan 1;29(suppl_1):i3-i9. doi: 10.1093/annonc/mdx702. PMID: 29462253.
- Lindeman NI, et al. Updated Molecular Testing Guideline for the Selection of Lung Cancer Patients for Treatment with Targeted Tyrosine Kinase Inhibitors: Guideline from the College of American Pathologists, the International Association for the Study of Lung Cancer, and the Association for Molecular Pathology. Arch Pathol Lab Med. 2018 Mar;142(3):321-346.
- Ettinger DS, et al. NCCN Guidelines Insights: Non-Small Cell Lung Cancer, Version 5.2018. J Natl ComprCancNetw. 2018 Jul;16(7):807-821.
- Planchard D, et al. Metastatic non-small cell lung cancer: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up. Ann Oncol. 2018 Oct 1;29(Suppl 4):iv192-iv237
- Kim ES, et al. Updates Regarding Biomarker Testing for Non-Small Cell Lung Cancer: Considerations from the National Lung Cancer Roundtable. JThoracOncol. 2019 Mar;14(3):338-342

Limitations and Disclaimer:

1. Insufficient tumor content may not allow the detection of EGFR mutations (< 15%); tumor content is evaluated prior to analysis and macro dissection is performed. Fixatives other than formalin or prolonged fixation time may interfere with results.
2. Detection of a mutation is dependent on the number of copies present in the specimen
3. The presence of PCR inhibitors may cause false negative or invalid results.
4. The kit can detect the listed mutations but cannot distinguish them.
5. The test was performed in a third-party lab
6. All results released pertain to the specimen as received by the lab for testing and under the assumption that the patient indicated or identified on the bill/test requisition form is the owner of the specimen.
7. Clinical details and consent forms, especially in Genetic testing, wherever applicable, are mandatory to be accompanied with the test requisition form. The non-availability of such information may lead to delay in reporting as well as misinterpretation of test results. The lab will not be responsible for any such delays or misinterpretations.
8. Test results are dependent on the quality of the sample received by the lab. In case the samples are pre-processed elsewhere (e.g., paraffin blocks), results may be compromised.
9. Samples will be discarded post processing after a specified period as per the laboratory's retention policy. Kindly get in touch with the lab for more information.

--- End of Report ---

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Appendix 1: List of the *EGFR* gene mutations tested.

Exon	Mutation	COSMIC* ID	Base change
18	G719A	6239	2156G>C
	G719S	6252	2155G>A
	G719C	6253	2155G>T
19	Deletions	12384	2237_2255>T
		12387	2239_2258>CA
		12419	2238_2252>GCA
		12422	2238_2248>GC
		13551	2235_2252>AAT
		12678	2237_2251del15
		6218	2239_2247del9
		12728	2236_2253del18
		12367	2237_2254del18
		6210	2240_2251del12
		6220	2238_2255del18
		6223	2235_2249del15
		6225	2236_2250del15
		6254	2239_2253del15
		6255	2239_2256del18
		12369	2240_2254del15
		12370	2240_2257del18
		12382	2239_2248TTAAGAGAAG>C
		12383	2239_2251>C
20	S768I	6241	2303G>T
	Insertions	12376	2307_2308insGCCAGCGTG
		12378	2310_2311insGGT
		12377	2319_2320insCAC
	T790M	6240	2369C>T
21	L858R	6224	2573T>G
	L861Q	6213	2582T>A

* COSMIC: Catalogue of somatic mutations in cancer: http://cancer.sanger.ac.uk/