Taipei Veterans General Hospital

Department of Pathology and Laboratory Medicine
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Sample Information

Patient Name: 莊佳敏
Gender: Female
ID No.: T222376968
History No.: 44623236
Age: 41

Ordering Doctor: DOC1878G 沈佳儀
Ordering REQ.: 0ALXFRC
Signing in Date: 2019/11/05

Path No.: S108-98787
MP No.: F1904
Assay: Oncomine Focus Assay
Sample Type: FFPE
Block No.: S108-47840C
Percentage of tumor cells: 80%
Note:

Sample Cancer Type: Non-Small Cell Lung Cancer

Report Highlights

2 Clinically Significant Biomarkers
1 Therapies Available
60 Clinical Trials

Clinically Significant Biomarkers

Indicated Contraindicated

Genomic Alteration	Relevant Therapies (In this cancer type)	Relevant Therapies (In other cancer type)	Clinical Trials
EGFR exon 20 insertion epidermal growth factor receptor Tier: IA Allele Frequency: 78.11%	osimertinib gefitinib [2]	None	58
EGFR amplification epidermal growth factor receptor Tier: IIC	None	None	7

Sources included in relevant therapies: FDA[1], NCCN, EMA[2], ESMO

Tier Criteria Met

Genomic Alteration	Tier Classification for Non-Small Cell Lung Cancer
EGFR exon 20 insertion Tier: IA	IA: Biomarker predicts response or resistance to FDA or EMA approved therapies in this cancer type IA: Biomarker is included in NCCN or ESMO guidelines that predict response or resistance to therapies in this cancer type IIC: Biomarker is an inclusion criteria for clinical trials
EGFR amplification Tier: IIC	IIC: Biomarker is an inclusion criteria for clinical trials

Reference: Li et al. *Standards and Guidelines for the Interpretation and Reporting of Sequence Variants in Cancer: A Joint Consensus Recommendation of the Association for Molecular Pathology, American Society of Clinical Oncology, and College of American Pathologists.* J Mol Diagn. 2017 Jan;19(1):4-23.

Variant Details

DNA Sequence Variants

Gene	Amino Acid Change	Coding	Variant ID	Locus	Allele Frequency	Transcript	Variant Effect	Coverage
EGFR	p.(M766_A767insASV)	c.2308_2309insCCAGCGTGG	COSM12376	chr7:55248998	78.11%	NM_005228.4	nonframeshift Insertion	1978
JAK1	p.(=)	c.2199A>G	.	chr1:65310489	51.22%	NM_002227.3	synonymous	1111
ALK	p.(D1529E)	c.4587C>G	.	chr2:29416366	99.90%	NM_004304.4	missense	1995
ALK	p.(I1461V)	c.4381A>G	.	chr2:29416572	99.80%	NM_004304.4	missense	1998
ALK	p.(=)	c.3375C>A	.	chr2:29445458	99.95%	NM_004304.4	synonymous	1987
FGFR3	p.(=)	c.1953G>A	.	chr4:1807894	99.72%	NM_000142.4	synonymous	718
PDGFRA	p.(=)	c.1701A>G	.	chr4:55141055	99.89%	NM_006206.5	synonymous	1879
FGFR4	p.(P136L)	c.407C>T	.	chr5:176517797	99.46%	NM_213647.2	missense	1483
FGFR4	p.(=)	c.483A>G	.	chr5:176517985	31.88%	NM_213647.2	synonymous	800
EGFR	p.(=)	c.2361G>A	.	chr7:55249063	87.78%	NM_005228.4	synonymous	1997
RET	p.(=)	c.2307G>T	.	chr10:43613843	50.15%	NM_020975.4	synonymous	1615

Copy Number Variations

Gene	Locus	Copy Number
EGFR	chr7:55198956	12.93

Relevant Therapy Summary

● In this cancer type ○ In other cancer type ◑ In this cancer type and other cancer types ⊘ Contraindicated ⚠ Both for use and contraindicated ✖ No evidence

EGFR exon 20 insertion

Relevant Therapy	FDA	NCCN	EMA	ESMO	Clinical Trials*
osimertinib	✖	●	✖	✖	● (II)
gefitinib	✖	✖	⊘	✖	● (III)
apatinib + erlotinib, apatinib + gefitinib, apatinib + icotinib hydrochloride	✖	✖	✖	✖	● (IV)
apatinib + gefitinib	✖	✖	✖	✖	● (IV)
erlotinib + natural product, erlotinib + placebo, gefitinib + natural product, gefitinib + placebo, icotinib hydrochloride + natural product, icotinib hydrochloride + placebo	✖	✖	✖	✖	● (IV)
gefitinib, radiation therapy	✖	✖	✖	✖	● (IV)
icotinib hydrochloride, radiation therapy	✖	✖	✖	✖	● (IV)
atezolizumab, bevacizumab, chemotherapy	✖	✖	✖	✖	● (III)
bevacizumab + chemotherapy, bevacizumab (Shanghai Hengrui Pharmaceutical) + chemotherapy	✖	✖	✖	✖	● (III)
chemotherapy, nivolumab	✖	✖	✖	✖	● (III)
erlotinib, gefitinib	✖	✖	✖	✖	● (III)
afatinib + bevacizumab	✖	✖	✖	✖	● (II)
afatinib + chemotherapy + radiation therapy + surgical intervention	✖	✖	✖	✖	● (II)
anlotinib hydrochloride + sintilimab	✖	✖	✖	✖	● (II)
apatinib + chemotherapy	✖	✖	✖	✖	● (II)
bevacizumab, osimertinib	✖	✖	✖	✖	● (II)
chemotherapy, ramucirumab	✖	✖	✖	✖	● (II)
erlotinib	✖	✖	✖	✖	● (II)
erlotinib + chemotherapy	✖	✖	✖	✖	● (II)
erlotinib + radiation therapy	✖	✖	✖	✖	● (II)
gefitinib + chemotherapy	✖	✖	✖	✖	● (II)

* Most advanced phase (IV, III, II/III, II, I/II, I) is shown and multiple clinical trials may be available.

Relevant Therapy Summary (continued)

● In this cancer type ○ In other cancer type ◑ In this cancer type and other cancer types ⊘ Contraindicated ⚠ Both for use and contraindicated ✖ No evidence

EGFR exon 20 insertion (continued)

Relevant Therapy	FDA	NCCN	EMA	ESMO	Clinical Trials*
icotinib hydrochloride	✖	✖	✖	✖	● (II)
ipilimumab, nivolumab	✖	✖	✖	✖	● (II)
KN046	✖	✖	✖	✖	● (II)
poziotinib	✖	✖	✖	✖	● (II)
radiation therapy, tyrosine kinase inhibitors	✖	✖	✖	✖	● (II)
sintilimab	✖	✖	✖	✖	● (II)
sunitinib	✖	✖	✖	✖	● (II)
targeted therapy, targeted therapy + chemotherapy	✖	✖	✖	✖	● (II)
tarloxotinib	✖	✖	✖	✖	● (II)
afatinib + necitumumab	✖	✖	✖	✖	● (I/II)
bevacizumab + erlotinib + chemotherapy	✖	✖	✖	✖	● (I/II)
cetuximab, cetuximab + natural killer cell therapy	✖	✖	✖	✖	● (I/II)
EMB01	✖	✖	✖	✖	● (I/II)
gefitinib + ningetinib	✖	✖	✖	✖	● (I/II)
icotinib hydrochloride + chemotherapy + radiation therapy	✖	✖	✖	✖	● (I/II)
oleclumab + osimertinib	✖	✖	✖	✖	● (I/II)
TAK788	✖	✖	✖	✖	● (I/II)
cetuximab + FATE-NK100	✖	✖	✖	✖	● (I)
durvalumab + oleclumab, oleclumab	✖	✖	✖	✖	● (I)
erlotinib + ixazomib	✖	✖	✖	✖	● (I)
everolimus + neratinib, neratinib + palbociclib, neratinib + trametinib	✖	✖	✖	✖	● (I)
JNJ-61186372	✖	✖	✖	✖	● (I)
necitumumab, osimertinib	✖	✖	✖	✖	● (I)
osimertinib, osimertinib + radiation therapy	✖	✖	✖	✖	● (I)

* Most advanced phase (IV, III, II/III, II, I/II, I) is shown and multiple clinical trials may be available.

Relevant Therapy Summary (continued)

● In this cancer type ○ In other cancer type ◑ In this cancer type and other cancer types ⊘ Contraindicated ⚠ Both for use and contraindicated ✖ No evidence

EGFR exon 20 insertion (continued)

Relevant Therapy	FDA	NCCN	EMA	ESMO	Clinical Trials*
pirotinib	✖	✖	✖	✖	● (I)
TP-0903	✖	✖	✖	✖	● (I)
tyrosine kinase inhibitors, tyrosine kinase inhibitors + chemotherapy	✖	✖	✖	✖	● (I)

EGFR amplification

Relevant Therapy	FDA	NCCN	EMA	ESMO	Clinical Trials*
apatinib + gefitinib	✖	✖	✖	✖	● (IV)
erlotinib	✖	✖	✖	✖	● (II)
gefitinib	✖	✖	✖	✖	● (II)
cetuximab + FATE-NK100	✖	✖	✖	✖	● (I)
everolimus + neratinib, neratinib + palbociclib, neratinib + trametinib	✖	✖	✖	✖	● (I)
TP-0903	✖	✖	✖	✖	● (I)

* Most advanced phase (IV, III, II/III, II, I/II, I) is shown and multiple clinical trials may be available.

Relevant Therapy Details

Current NCCN Information

In this cancer type | In other cancer type | In this cancer type and other cancer types | Contraindicated | Not recommended | Resistance

NCCN information is current as of 2019-05-15. For the most up-to-date information, search www.nccn.org.
For NCCN International Adaptations & Translations, search www.nccn.org/global/international_adaptations.aspx.

EGFR exon 20 insertion

osimertinib

Cancer type: Non-Small Cell Lung Cancer **Variant class:** EGFR mutation

NCCN Recommendation category: 2A

Population segment (Line of therapy):
- Non-Small Cell Lung Cancer; Brain metastases; Newly diagnosed (Not specified)
- Non-Small Cell Lung Cancer; Leptomeningeal and Spine metastases (Not specified)

Reference: NCCN Guidelines® - NCCN-Central Nervous System Cancers [Version 1.2019]

pembrolizumab

Cancer type: Non-Small Cell Lung Cancer **Variant class:** EGFR mutation

Other criteria: CD274 overexpression

Summary:
NCCN Guidelines® include the following supporting statement(s):
- "A small study suggests that single-agent pembrolizumab is not effective as first-line therapy in patients with metastatic NSCLC and EGFR mutations, even those with PD-L1 levels more than 50%."

Reference: NCCN Guidelines® - NCCN-Non-Small Cell Lung Cancer [Version 5.2019]

EGFR tyrosine kinase inhibitor

Cancer type: Non-Small Cell Lung Cancer **Variant class:** EGFR exon 20 insertion

Summary:
NCCN Guidelines® include the following supporting statement(s):
- "Patients with EGFR exon 20 insertion mutations are usually resistant to TKIs, although there are rare exceptions."

Reference: NCCN Guidelines® - NCCN-Non-Small Cell Lung Cancer [Version 5.2019]

Current EMA Information

In this cancer type | In other cancer type | In this cancer type and other cancer types | Contraindicated | Not recommended | Resistance

EMA information is current as of 2019-08-23. For the most up-to-date information, search www.ema.europa.eu/ema.

EGFR exon 20 insertion

gefitinib

Cancer type: Non-Small Cell Lung Cancer **Label as of:** 2019-05-28 **Variant class:** EGFR exon 20 insertion

Reference:

https://www.ema.europa.eu/en/documents/product-information/iressa-epar-product-information_en.pdf

Signatures

Testing Personnel: Zih-Yu Liu 2019.11.14 08:33:21 +08'00'

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