

Department of Pathology and Laboratory Medicine No.201, Sec. 2, Shipai Rd., Beitou District, Taipei City, Taiwan 11217, R.O.C.

Tel: 02-2875-7449

Date: 17 Jan 2024 1 of 13

Sample Information

Patient Name: 盧麗珠 Gender: Female ID No.: S222030957 History No.: 38185045

Age: 55

Ordering Doctor: DOC3127D 趙恒勝

Ordering REQ.: D7A23K8 Signing in Date: 2024/1/16

Path No.: M113-00012 **MP No.:** F24008

Assay: Oncomine Focus Assay

Sample Type: FFPE Block No.: \$112-69582A Percentage of tumor cells: 70%

Reporting Doctor: DOC5466K 葉奕成 (Phone: 8#5466)

Note:

Sample Cancer Type: Non-Small Cell Lung Cancer

Table of Contents	Page
Variants (Exclude variant in Taiwan BioBank with >1% allele frequency)	2
Biomarker Descriptions	2
Relevant Therapy Summary	3
Relevant Therapy Details	4
Clinical Trials Summary	8
Alert Details	8

Report Highlights

- 1 Relevant Biomarkers
- 2 Therapies Available
- 7 Clinical Trials

Relevant Non-Small Cell Lung Cancer Variants

Gene	Finding	Gene	Finding	
ALK	None detected	NTRK1	None detected	
BRAF	None detected	NTRK2	None detected	
EGFR	EGFR exon 20 insertion	NTRK3	None detected	
ERBB2	None detected	RET	None detected	
KRAS	None detected	ROS1	None detected	
MET	None detected			

2 of 13

Date: 17 Jan 2024

Relevant Biomarkers

Tier	Genomic Alteration	Relevant Therapies (In this cancer type)	Relevant Therapies (In other cancer type)	Clinical Trials
IA	EGFR exon 20 insertion epidermal growth factor receptor Allele Frequency: 14.15%	amivantamab 1, 2 mobocertinib 1	None	7

Public data sources included in relevant therapies: FDA1, NCCN, EMA2, ESMO

Tier 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.

Alerts informed by public data sources: O Contraindicated, U Resistance

EGFR exon 20 insertion

o gefitinib²

afatinib, dacomitinib, erlotinib, gefitinib

Public data sources included in alerts: FDA1, NCCN, EMA2, ESMO

Variants (Exclude variant in Taiwan BioBank with >1% allele frequency)

DNA Sequence Variants Allele Amino Acid Change Coding Variant ID Locus Frequency Transcript Variant Effect Coverage Gene c.2311_2312insGCGT COSM13428 **EGFR** p.(S768_D770dup) chr7:55249002 14.15% NM_005228.5 nonframeshift 1958 **GGACA** Insertion

Biomarker Descriptions

EGFR exon 20 insertion

epidermal growth factor receptor

Background: The EGFR gene encodes the epidermal growth factor receptor (EGFR) tyrosine kinase, a member of the ERBB/human epidermal growth factor receptor (HER) family. In addition to EGFR/ERBB1/HER1, other members of the ERBB/HER family include ERBB2/HER2, ERBB3/HER3, and ERBB4/HER41. EGFR ligand induced dimerization results in kinase activation and leads to stimulation of oncogenic signaling pathways including the PI3K/AKT/MTOR and RAS/RAF/MEK/ERK pathways. Activation of these pathways promote cell proliferation, differentiation, and survival^{2,3}.

Alterations and prevalence: Recurrent somatic mutations in the tyrosine kinase domain (TKD) of EGFR are observed in approximately 10-20% of lung adenocarcinoma, and at higher frequencies in never-smoker, female, and Asian populations^{4,5,6,7}. The most common mutations occur near the ATP-binding pocket of the TKD and include short in-frame deletions in exon 19 (EGFR exon 19 deletion) and the L858R amino acid substitution in exon 218. These mutations constitutively activate EGFR resulting in downstream signaling, and represent 80% of the EGFR mutations observed in lung cancer. A second group of less prevalent activating mutations include E709K, G719X, S768I, L861Q, and short in-frame insertion mutations in exon 209,10,11,12. EGFR activating mutations in lung cancer tend to be mutually exclusive to KRAS activating mutations¹³. In contrast, a different set of recurrent activating EGFR mutations in the extracellular domain include R108K, A289V and G598V and are primarily observed in glioblastoma^{8,14}. Amplification of EGFR is observed in several cancer types including 30% of glioblastoma, 12% of esophageal cancer, 10% of head and neck cancer, 5% of bladder cancer, and 5% of lung squamous cell carcinoma^{5,6,7,14,15}. Deletion of exons 2-7, encoding the extracellular domain of EGFR (EGFRVIII), results in overexpression of a ligand-independent constitutively active protein and is observed in approximately 30% of glioblastoma^{16,17,18}.

Potential relevance: Approved first-generation EGFR tyrosine kinase inhibitors (TKIs) include erlotinib¹⁹ (2004) and gefitinib²⁰ (2015). which block the activation of downstream signaling by reversible interaction with the ATP-binding site. Although initially approved for advanced lung cancer, the discovery that drug sensitivity was associated with exon 19 and exon 21 activating mutations allowed first-generation TKIs to become subsequently approved for front-line therapy in lung cancer tumors containing exon 19 or exon 21 activating mutations. Second-generation TKIs afatinib²¹ (2013) and dacomitinib²² (2018) bind EGFR and other ERBB/HER gene family members irreversibly and were subsequently approved. First- and second-generation TKIs afatinib, dacomitinib, erlotinib, and gefitinib are recommended for the treatment NSCLC harboring EGFR exon 19 insertions, exon 19 deletions, point mutations L861Q, L858R, S768I, and codon 719 mutations, whereas most EGFR exon 20 insertions, except p.A763 Y764insF0EA, confer resistance to the same therapies^{23,24,25,26}. However, in 2021, the irreversible tyrosine kinase inhibitor, mobocertinib²⁷was FDA approved for the

No evidence

×

(I)

Biomarker Descriptions (continued)

treatment of NSCLC with EGFR exon 20 insertion mutations. Additionally, in 2022, the FDA granted breakthrough therapy designation to the irreversible EGFR inhibitors, CLN-081 (TPC-064)²⁸ and sunvozertinib²⁹, for locally advanced or metastatic non-small cell lung cancer harboring EGFR exon 20 insertion mutations. In lung cancer containing EGFR exon 19 or 21 activating mutations, treatment with TKIs is eventually associated with the emergence of drug resistance³⁰. The primary resistance mutation that emerges following treatment with first-generation TKI is T790M, accounting for 50-60% of resistant cases8. Third generation TKIs were developed to maintain sensitivity in the presence of T790M. Osimertinib³¹ (2015) is an irreversible inhibitor indicated for metastatic EGFR T790M positive lung cancer and for the first-line treatment of metastatic NSCLC containing EGFR exon 19 deletions or exon 21 L858R mutations. Like first-generation TKIs, treatment with osimertinib is associated with acquired resistance. In this case, resistance is associated with the C797S mutation and occurs in 22-44% of cases30. The T790M and C797S mutations may be each selected following sequential treatment with a first-generation TKI followed by a third-generation TKI or vice versa³². T790M and C797S can occur in either cis or trans allelic orientation³². If C797S is observed following progression after treatment with a third-generation TKI in the first-line setting, sensitivity may be retained to first-generation TKIs³². If C797S co-occurs in trans with T790M following sequential treatment with first- and third-generation TKIs, patients may exhibit sensitivity to combination first- and third-generation TKIs, but resistance to third-generation TKIs alone^{32,33}. However, C797S occurring in cis conformation with T790M, confers resistance to first- and third-generation TKIs³². Fourth-generation TKIs are in development to overcome acquired C797S and T790M resistance mutations after osimertinib treatment. EGFR targeting antibodies including cetuximab (2004), panitumumab (2006), and necitumumab (2016) are under investigation in combination with EGFR-targeting TKIs for efficacy against EGFR mutations. The bispecific antibody, amivantamab34, targeting EGFR and MET was approved (2021) for NSCLC tumors harboring EGFR exon 20 insertion mutations. CPO30135 received a fast track designation (2023) from the FDA for EGFR mutations in patients with metastatic NSCLC who are relapsed/refractory or ineligible for EGFR targeting therapy such as 3rd-generation EGFR inhibitors including osimertinib. The Oncoprex immunogene therapy quaratusugene ozeplasmid³⁶ in combination with osimertinib received a fast track designation from the FDA (2020) for NSCLC tumors harboring EGFR mutations that progressed on osimertinib alone. BDTX-18937 was granted a fast track designation (2020) for the treatment of solid tumors harboring an EGFR exon 20 insertion mutation.

Relevant Therapy Summary

In this cancer type

BAY-2927088

In other cancer type

EGFR exon 20 insertion					
Relevant Therapy	FDA	NCCN	EMA	ESMO	Clinical Trials
amivantamab	•				×
mobocertinib	•	×	×		×
furmonertinib	×	×	×	×	(III)
chemotherapy	×	×	×	×	(II/III)
BLU-451	×	×	×	×	(I/II)
sunvozertinib	×	×	×	×	(I/II)
zipalertinib	×	×	×	×	(1/11)
ABBV 400	×	×	×	×	(I)

In this cancer type and other cancer types

×

×

X

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

Date: 17 Jan 2024 4 of 13

Relevant Therapy Details

Current FDA Information

In this cancer type

O In other cancer type

In this cancer type and other cancer types

FDA information is current as of 2023-11-15. For the most up-to-date information, search www.fda.gov.

EGFR exon 20 insertion

amivantamab

Cancer type: Non-Small Cell Lung Cancer Label as of: 2022-11-04 Variant class: EGFR exon 20 insertion

Indications and usage:

RYBREVANT® is a bispecific EGF receptor-directed and MET receptor directed antibody indicated for the treatment of adult patients with locally advanced or metastatic non-small cell lung cancer (NSCLC) with epidermal growth factor receptor (EGFR) exon 20 insertion mutations, as detected by an FDA-approved test, whose disease has progressed on or after platinum-based chemotherapy.

This indication is approved under accelerated approval based on overall response rate and duration of response. Continued approval for this indication may be contingent upon verification and description of clinical benefit in the confirmatory trials.

Reference:

https://www.accessdata.fda.gov/drugsatfda_docs/label/2022/761210s002lbl.pdf

mobocertinib

Cancer type: Non-Small Cell Lung Cancer Label as of: 2023-09-15 Variant class: EGFR exon 20 insertion

Indications and usage:

EXKIVITY® is a kinase inhibitor indicated for the treatment of adult patients with locally advanced or metastatic non-small cell lung cancer (NSCLC) with epidermal growth factor receptor (EGFR) exon 20 insertion mutations, as detected by an FDA-approved test, whose disease has progressed on or after platinum-based chemotherapy.

This indication is approved under accelerated approval based on overall response rate and duration of response. Continued approval for this indication may be contingent upon verification and description of clinical benefit in confirmatory trial(s).

Reference:

https://www.accessdata.fda.gov/drugsatfda_docs/label/2023/215310s003lbl.pdf

Date: 17 Jan 2024 5 of 13

Current NCCN Information

In this cancer type

O In other cancer type

In this cancer type and other cancer types

NCCN information is current as of 2023-11-01. To view the most recent and complete version of the guideline, go online to NCCN.org.

For NCCN International Adaptations & Translations, search www.nccn.org/global/what-we-do/international-adaptations.

Some variant specific evidence in this report may be associated with a broader set of alterations from the NCCN Guidelines. Specific variants listed in this report were sourced from approved therapies or scientific literature. These therapeutic options are appropriate for certain population segments with cancer. Refer to the NCCN Guidelines® for full recommendation.

All guidelines cited below are referenced with permission from the NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines®) National Comprehensive Cancer Network, Inc. 2023. All rights reserved. NCCN makes no warranties regarding their content.

EGFR exon 20 insertion

amivantamab

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

NCCN Recommendation category: 2A

Population segment (Line of therapy):

 Adenocarcinoma, Large Cell, Squamous Cell, Not otherwise specified (NOS); Advanced, Metastatic, Progression (Subsequent therapy)

Reference: NCCN Guidelines® - NCCN-Non-Small Cell Lung Cancer [Version 4.2023]

Date: 17 Jan 2024 6 of 13

Current EMA Information

In this cancer type
In other cancer type
In this cancer type and other cancer types

EMA information is current as of 2023-11-15. For the most up-to-date information, search www.ema.europa.eu/ema.

EGFR exon 20 insertion

amivantamab

Cancer type: Non-Small Cell Lung Cancer Label as of: 2023-09-22 Variant class: EGFR exon 20 insertion

Reference:

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

Date: 17 Jan 2024 7 of 13

Current ESMO Information

In this cancer type
In other cancer type
In this cancer type and other cancer types

ESMO information is current as of 2023-11-01. For the most up-to-date information, search www.esmo.org.

EGFR exon 20 insertion

amivantamab

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

ESMO Level of Evidence/Grade of Recommendation: III / B

Population segment (Line of therapy):

■ Stage IV; Metastatic, Advanced (Subsequent therapy); ESMO-MCBS v1.1 score: 3

Reference: ESMO Clinical Practice Guidelines - ESMO-Oncogene-addicted Metastatic Non-Small-Cell Lung Cancer [Annals of Oncology (2023), doi: https://doi.org/10.1016/j.annonc.2022.12.009 (Published)]

mobocertinib

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

ESMO Level of Evidence/Grade of Recommendation: III / C

Population segment (Line of therapy):

Stage IV; Advanced, Metastatic (Subsequent therapy); ESMO-MCBS v1.1 score: 2

Reference: ESMO Clinical Practice Guidelines - ESMO-Oncogene-addicted Metastatic Non-Small-Cell Lung Cancer [Annals of Oncology (2023), doi: https://doi.org/10.1016/j.annonc.2022.12.009 (Published)]

Date: 17 Jan 2024 8 of 13

Clinical Trials in Taiwan region:

Clinical Trials Summary

EGFR exon 20 insertion

NCT ID	Title	Phase
NCT05607550	A Global, Phase III, Randomized, Multicenter, Open-Label Study to Investigate the Efficacy and Safety of Furmonertinib Compared to Platinum-Based Chemotherapy as First-Line Treatment for Patients With Locally Advanced or Metastatic Non-Small Cell Lung Cancer With Epidermal Growth Factor Receptor Exon 20 Insertion Mutations	
NCT05241873	Phase I/II Study of BLU-451 in Advanced Cancers With EGFR Exon 20 Insertion Mutations	1/11
NCT03974022	A Phase I/II, Open-Label, Multicenter Study to Assess the Safety, Tolerability, Pharmacokinetics and Anti-tumor Efficacy of DZD9008 in Patients With Advanced Non-Small Cell Lung Cancer (NSCLC) with EGFR or HER2 Mutation	1/11
NCT04036682	A Phase I/II, Open-Label, Multi-Center Trial to Assess Safety, Tolerability, Pharmacokinetics, Pharmacodynamics, and Efficacy of CLN-081 in Patients With Locally-Advanced or Metastatic Non-Small Cell Lung Cancer Harboring EGFR Exon 20 Insertion Mutations Who Have Previously Received Platinum-Based Systemic Chemotherapy	I/II
NCT05099172	An Open Label, First-in-human Study of BAY 2927088 in Participants With Advanced Non-small Cell Lung Cancer (NSCLC) Harboring an EGFR and/or HER2 Mutation	1
NCT03178552	A Phase II/III Multicenter Study Evaluating the Efficacy and Safety of Multiple Targeted Therapies as Treatments for Patients With Advanced or Metastatic Non-Small Cell Lung Cancer (NSCLC) Harboring Actionable Somatic Mutations Detected in Blood (B-FAST: Blood-First Assay Screening Trial)	11/111
NCT05029882	A Phase I First in Human Study Evaluating Safety, Pharmacokinetics and Efficacy of ABBV-400 in Adult Subjects With Advanced Solid Tumors	I

Alerts Informed By Public Data Sources

Current FDA Information







Resistance



Breakthrough



A Fast Track

Variant class: EGFR exon 20 insertion

FDA information is current as of 2023-11-15. For the most up-to-date information, search www.fda.gov.

EGFR exon 20 insertion

sunvozertinib

Cancer type: Non-Small Cell Lung Cancer

Supporting Statement:

The FDA has granted Breakthrough Therapy Designation to a selective, irreversible, novel epidermal growth factor receptor (EGFR) inhibitor, DZD9008 (Sunvozertinib) for EGFR exon 20 insertion mutation positive locally advanced or metastatic non-small cell lung cancer.

Reference:

https://www.biospace.com/article/releases/fda-grants-breakthrough-therapy-designation-for-dizal-pharmaceutical-s-dzd9008-inpatients-with-locally-advanced-or-metastatic-non-small-cell-lung-cancer-harboring-egfr-exon20-insertion/

Date: 17 Jan 2024 9 of 13

Variant class: EGFR exon 20 insertion

Variant class: EGFR exon 20 insertion

Variant class: EGFR exon 20 insertion

Variant class: EGFR mutation

EGFR exon 20 insertion (continued)

sunvozertinib

Cancer type: Non-Small Cell Lung Cancer

Supporting Statement:

The FDA has granted Breakthrough Designation to a small molecule inhibitor, DZD9008 (sunvozertinib), for the treatment of patients with locally advanced or metastatic non-small cell lung cancer (NSCLC) with epidermal growth factor receptor (EGFR) exon20 insertion mutations whose disease has progressed on or after platinum-based chemotherapy.

Reference:

https://www.prnewswire.com/news-releases/fda-grants-breakthrough-therapy-designation-for-dizal-pharmaceuticals-dzd9008-in-patients-with-locally-advanced-or-metastatic-non-small-cell-lung-cancer-harboring-egfr-exon20-insertion-301469692.html

zipalertinib

Cancer type: Non-Small Cell Lung Cancer

Supporting Statement:

The FDA has granted Breakthrough Therapy Designation to an irreversible EGFR inhibitor, zipalertinib (CLN-081), for EGFR exon 20 insertion mutations in locally advanced or metastatic non-small cell lung cancer who have previously received platinum-based systemic chemotherapy.

Reference:

https://investors.cullinanoncology.com/news-releases/news-release-details/fda-grants-breakthrough-therapy-designation-cullinan-oncologys

♣ BDTX-189

Cancer type: Solid Tumor

Supporting Statement:

The FDA has granted Fast Track Designation to BDTX-189 for solid tumors harboring a HER2 mutation or an EGFR or HER2 exon 20 insertion after progression on prior therapy.

Reference:

https://investors.black diamond the rapeutics.com/news-releases/news-release-details/black-diamond-the rapeutics-granted-fast-track-designation-fda

A CPO-301

Cancer type: Non-Small Cell Lung Cancer

Supporting Statement:

The FDA has granted Fast Track Designation to a first-in-class antibody drug conjugate, CPO301, for EGFR mutations in patients with metastatic non-small cell lung cancer (NSCLC) who are relapsed/refractory to or ineligible for EGFR targeting therapy such as 3rd-generation EGFR inhibitors including Osimertinib.

Reference:

http://iis.aastocks.com/20230612/10770455-0.PDF

Date: 17 Jan 2024 10 of 13

EGFR exon 20 insertion (continued)

A osimertinib + quaratusugene ozeplasmid

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

Supporting Statement:

The FDA has granted Fast Track Designation to the immunogene therapy, quaratusugene ozeplasmid, in combination with EGFR inhibitor osimertinib for the treatment of EGFR mutations in non-small cell lung cancer (NSCLC) patients that progressed after treatment with osimertinib alone.

Reference:

https://www.genprex.com/news/genprex-receives-u-s-fda-fast-track-designation-for-gene-therapy-that-targets-lung-cancer/

Current NCCN Information

Contraindicated

Not recommended



Breakthrough

Fast Track

NCCN information is current as of 2023-11-01. To view the most recent and complete version of the guideline, go online to NCCN.org.

For NCCN International Adaptations & Translations, search www.nccn.org/global/what-we-do/international-adaptations.

Some variant specific evidence in this report may be associated with a broader set of alterations from the NCCN Guidelines. Specific variants listed in this report were sourced from approved therapies or scientific literature. These therapeutic options are appropriate for certain population segments with cancer. Refer to the NCCN Guidelines® for full recommendation.

All guidelines cited below are referenced with permission from the NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines®) National Comprehensive Cancer Network, Inc. 2023. All rights reserved. NCCN makes no warranties regarding their content.

EGFR exon 20 insertion

afatinib

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

Summary:

NCCN Guidelines® include the following supporting statement(s):

■ "EGFR exon 20 insertions are generally associated with a lack of response to first, second, and third generation tyrosine kinase inhibitors with select exceptions."

Reference: NCCN Guidelines® - NCCN-Non-Small Cell Lung Cancer [Version 4.2023]

dacomitinib

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

Summary:

NCCN Guidelines® include the following supporting statement(s):

"EGFR exon 20 insertions are generally associated with a lack of response to first, second, and third generation tyrosine kinase inhibitors with select exceptions."

Reference: NCCN Guidelines® - NCCN-Non-Small Cell Lung Cancer [Version 4.2023]

Date: 17 Jan 2024 11 of 13

EGFR exon 20 insertion (continued)

erlotinib

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

Summary:

NCCN Guidelines® include the following supporting statement(s):

"EGFR exon 20 insertions are generally associated with a lack of response to first, second, and third generation tyrosine kinase inhibitors with select exceptions."

Reference: NCCN Guidelines® - NCCN-Non-Small Cell Lung Cancer [Version 4.2023]

gefitinib

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

Summary:

NCCN Guidelines® include the following supporting statement(s):

■ "EGFR exon 20 insertions are generally associated with a lack of response to first, second, and third generation tyrosine kinase inhibitors with select exceptions."

Reference: NCCN Guidelines® - NCCN-Non-Small Cell Lung Cancer [Version 4.2023]

Current EMA Information

Ocontraindicated Not recommended Resistance Preakthrough Fast Track

EMA information is current as of 2023-11-15. 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: 2023-07-27 Variant class: EGFR exon 20 insertion

Reference:

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

gefitinib

Cancer type: Non-Small Cell Lung Cancer Label as of: 2023-07-17 Variant class: EGFR exon 20 insertion

Reference:

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

Date: 17 Jan 2024

References

- King et al. Amplification of a novel v-erbB-related gene in a human mammary carcinoma. Science. 1985 Sep 6;229(4717):974-6.
 PMID: 2992089
- 2. Zhixiang. ErbB Receptors and Cancer. Methods Mol. Biol. 2017;1652:3-35. PMID: 28791631
- 3. Gutierrez et al. HER2: biology, detection, and clinical implications. Arch. Pathol. Lab. Med. 2011 Jan;135(1):55-62. PMID: 21204711
- 4. Pines et al. Oncogenic mutant forms of EGFR: lessons in signal transduction and targets for cancer therapy. FEBS Lett. 2010 Jun 18;584(12):2699-706. PMID: 20388509
- 5. Cancer Genome Atlas Research Network. Comprehensive molecular profiling of lung adenocarcinoma. Nature. 2014 Jul 31;511(7511):543-50. doi: 10.1038/nature13385. Epub 2014 Jul 9. PMID: 25079552
- 6. Weinstein et al. The Cancer Genome Atlas Pan-Cancer analysis project. Nat. Genet. 2013 Oct;45(10):1113-20. PMID: 24071849
- 7. Cerami et al. The cBio cancer genomics portal: an open platform for exploring multidimensional cancer genomics data. Cancer Discov. 2012 May;2(5):401-4. PMID: 22588877
- 8. da et al. EGFR mutations and lung cancer. Annu Rev Pathol. 2011;6:49-69. doi: 10.1146/annurev-pathol-011110-130206. PMID: 20887192
- 9. Arcila et al. EGFR exon 20 insertion mutations in lung adenocarcinomas: prevalence, molecular heterogeneity, and clinicopathologic characteristics. Mol. Cancer Ther. 2013 Feb;12(2):220-9. PMID: 23371856
- Kobayashi et al. EGFR Exon 18 Mutations in Lung Cancer: Molecular Predictors of Augmented Sensitivity to Afatinib or Neratinib as Compared with First- or Third-Generation TKIs. Clin Cancer Res. 2015 Dec 1;21(23):5305-13. doi: 10.1158/1078-0432.CCR-15-1046. Epub 2015 Jul 23. PMID: 26206867
- 11. Yasuda et al. Structural, biochemical, and clinical characterization of epidermal growth factor receptor (EGFR) exon 20 insertion mutations in lung cancer. Sci Transl Med. 2013 Dec 18;5(216):216ra177. PMID: 24353160
- 12. Chiu et al. Epidermal Growth Factor Receptor Tyrosine Kinase Inhibitor Treatment Response in Advanced Lung Adenocarcinomas with G719X/L861Q/S768I Mutations. J Thorac Oncol. 2015 May;10(5):793-9. PMID: 25668120
- 13. Karachaliou et al. KRAS mutations in lung cancer. Clin Lung Cancer. 2013 May;14(3):205-14. PMID: 23122493
- 14. Brennan et al. The somatic genomic landscape of glioblastoma. Cell. 2013 Oct 10;155(2):462-77. PMID: 24120142
- 15. Cancer Genome Atlas Network. Comprehensive genomic characterization of head and neck squamous cell carcinomas. Nature. 2015 Jan 29;517(7536):576-82. PMID: 25631445
- 16. Mitsudomi et al. Epidermal growth factor receptor in relation to tumor development: EGFR gene and cancer. FEBS J. 2010 Jan;277(2):301-8. PMID: 19922469
- 17. Gazdar. Activating and resistance mutations of EGFR in non-small-cell lung cancer: role in clinical response to EGFR tyrosine kinase inhibitors. Oncogene. 2009 Aug;28 Suppl 1:S24-31. PMID: 19680293
- 18. Gan et al. The EGFRvIII variant in glioblastoma multiforme. J Clin Neurosci. 2009 Jun;16(6):748-54. PMID: 19324552
- 19. https://www.accessdata.fda.gov/drugsatfda_docs/label/2016/021743s025lbl.pdf
- 20. https://www.accessdata.fda.gov/drugsatfda_docs/label/2021/206995s004lbl.pdf
- 21. https://www.accessdata.fda.gov/drugsatfda_docs/label/2022/201292s017lbl.pdf
- 22. https://www.accessdata.fda.gov/drugsatfda_docs/label/2020/211288s003lbl.pdf
- 23. NCCN Guidelines® NCCN-Non-Small Cell Lung Cancer [Version 4.2023]
- 24. Naidoo et al. Epidermal growth factor receptor exon 20 insertions in advanced lung adenocarcinomas: Clinical outcomes and response to erlotinib. Cancer. 2015 Sep 15;121(18):3212-3220. PMID: 26096453
- 25. Vyse et al. Targeting EGFR exon 20 insertion mutations in non-small cell lung cancer. Signal Transduct Target Ther. 2019;4:5. PMID: 30854234
- 26. Yi et al. A comparison of epidermal growth factor receptor mutation testing methods in different tissue types in non-small cell lung cancer. Int J Mol Med. 2014 Aug;34(2):464-74. PMID: 24891042
- 27. https://www.accessdata.fda.gov/drugsatfda_docs/label/2023/215310s003lbl.pdf
- 28. https://investors.cullinanoncology.com/news-releases/news-release-details/fda-grants-breakthrough-therapy-designation-cullinan-oncologys
- 29. https://www.prnewswire.com/news-releases/fda-grants-breakthrough-therapy-designation-for-dizal-pharmaceuticals-dzd9008-in-patients-with-locally-advanced-or-metastatic-non-small-cell-lung-cancer-harboring-egfr-exon20-insertion-301469692.html
- 30. Madic et al. EGFR C797S, EGFR T790M and EGFR sensitizing mutations in non-small cell lung cancer revealed by six-color crystal digital PCR. Oncotarget. 2018 Dec 21;9(100):37393-37406. PMID: 30647840

References (continued)

- 31. https://www.accessdata.fda.gov/drugsatfda_docs/label/2023/2080650rig1s028lbl.pdf
- 32. Niederst et al. The Allelic Context of the C797S Mutation Acquired upon Treatment with Third-Generation EGFR Inhibitors Impacts Sensitivity to Subsequent Treatment Strategies. Clin. Cancer Res. 2015 Sep 1;21(17):3924-33. PMID: 25964297
- 33. Wang et al. Lung Adenocarcinoma Harboring EGFR T790M and In Trans C797S Responds to Combination Therapy of First- and Third-Generation EGFR TKIs and Shifts Allelic Configuration at Resistance. J Thorac Oncol. 2017 Nov;12(11):1723-1727. PMID: 28662863
- 34. https://www.accessdata.fda.gov/drugsatfda_docs/label/2022/761210s002lbl.pdf
- 35. http://iis.aastocks.com/20230612/10770455-0.PDF
- 36. https://www.genprex.com/news/genprex-receives-u-s-fda-fast-track-designation-for-gene-therapy-that-targets-lung-cancer/
- 37. https://investors.blackdiamondtherapeutics.com/news-releases/news-release-details/black-diamond-therapeutics-granted-fast-track-designation-fda