



[Oncofocus] Patient Test Report

Surname

Requesting clinician

Forename

DOB

Date requested

Gender

Female

Histology #

Tumour % 70

Primary site

Breast

Tumour %

Tumour subtype

Adenocarcinoma

(macrodissected)

Tissue type

Liver

Comment:

The DNA and RNA extracted from this sample were of optimal quality. The Oncofocus assay on which the sample was run met all assay specific quality metrics. 167 genes were targeted covering 977 unique coding hot spots, 281 fusions and 19 CNV genes.

An ERBB2 variant of unknown clinical significance has been identified and classified as likely pathogenic. 9 clinical trials for ERBB2 mutations in breast cancer are listed, however this specific variant is not referenced in eligibility criteria.

In light of the broad range of potential therapies identified, alternate allele frequencies have been included in the report.

Variant Summary

Sample Cancer Type: Breast Cancer

In this cancer type
 In other cancer type
 In this cancer type and other cancer types
 Contraindicated
 Both for use and contraindicated
 No evidence

| Gene Variant | Alt allele freq | EMA | US-FDA | ESMO | US-NCCN | Global Clinical Trials |
|-----------------------------|-----------------|---------------------------|---------------------------|---------------------------|---------------------------------------|---------------------------------------|
| BRAF p.(V600E) c.1799T>A | 5% | <input type="radio"/> (5) | <input type="radio"/> (5) | <input type="radio"/> (5) | <input checked="" type="radio"/> (11) | <input checked="" type="radio"/> (21) |
| PIK3CA p.(G1049R) c.3145G>C | 58% | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> (17) |
| ERBB2 p.(G727A) c.2180G>C | 39% | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> (2) | <input checked="" type="radio"/> (9) |

EMA: European Medicine Agency, **US-FDA:** United States-Food and Drug Administration, **ESMO:** European Society for Medical Oncology, **US-NCCN:** United States-National Comprehensive Cancer Network. Numbers in parentheses indicate the number of relevant therapies with evidence.

Hotspot variants with >10% alternate allele reads, and in >10 unique reads are classified as 'detected'. Copy number variants of a >5% confidence value of ≥4 after normalisation are classified as amplified. Gene Fusions are reported when occurring in >20 counts and meeting the thresholds of assay specific internal RNA quality control. Assay sensitivity and positive predictive value is 99% when these thresholds are met. Supplementary technical information is available upon request.

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Other mutations, copy number variations, or fusions that were detected but not classified by the Oncofocus Test as actionable by a known therapeutic targeted agent are not listed in the results section of this report.

DISCLAIMER: The data presented here is a result of the curation of published data sources, but may not be exhaustive. The data version is 2016.05(003).

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

BRAF p.(V600E) c.1799T>A

| Relevant Therapy | EMA | US-FDA | ESMO | US-NCCN | Global Clinical Trials* |
|---|----------------------------------|----------------------------------|----------------------------------|----------------------------------|---|
| vemurafenib | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> (I) |
| cobimetinib + vemurafenib | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| dabrafenib | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| dabrafenib + trametinib | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| trametinib | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| ipilimumab | <input checked="" type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| nivolumab | <input checked="" type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| pembrolizumab | <input checked="" type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| BRAF inhibitor | <input checked="" type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> | <input checked="" type="radio"/> |
| BRAF inhibitor + MEK inhibitor | <input checked="" type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> | <input checked="" type="radio"/> |
| ipilimumab + nivolumab | <input checked="" type="radio"/> | <input checked="" type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| cetuximab | <input checked="" type="radio"/> | <input checked="" type="radio"/> | <input checked="" type="radio"/> | <input checked="" type="radio"/> | <input checked="" type="radio"/> |
| panitumumab | <input checked="" type="radio"/> | <input checked="" type="radio"/> | <input checked="" type="radio"/> | <input checked="" type="radio"/> | <input checked="" type="radio"/> |
| erlotinib, pertuzumab + trastuzumab, vemurafenib, vismodegib | <input checked="" type="radio"/> | <input checked="" type="radio"/> | <input checked="" type="radio"/> | <input checked="" type="radio"/> | <input checked="" type="radio"/> (II) |
| binimetinib + encorafenib, binimetinib + encorafenib + ribociclib | <input checked="" type="radio"/> | <input checked="" type="radio"/> | <input checked="" type="radio"/> | <input checked="" type="radio"/> | <input checked="" type="radio"/> (I/II) |
| cetuximab + vemurafenib + chemotherapy | <input checked="" type="radio"/> | <input checked="" type="radio"/> | <input checked="" type="radio"/> | <input checked="" type="radio"/> | <input checked="" type="radio"/> (I/II) |
| LNP3794 | <input checked="" type="radio"/> | <input checked="" type="radio"/> | <input checked="" type="radio"/> | <input checked="" type="radio"/> | <input checked="" type="radio"/> (I/II) |
| NKTR-214 | <input checked="" type="radio"/> | <input checked="" type="radio"/> | <input checked="" type="radio"/> | <input checked="" type="radio"/> | <input checked="" type="radio"/> (I/II) |
| PLX-8394 | <input checked="" type="radio"/> | <input checked="" type="radio"/> | <input checked="" type="radio"/> | <input checked="" type="radio"/> | <input checked="" type="radio"/> (I/II) |
| AB-024 | <input checked="" type="radio"/> | <input checked="" type="radio"/> | <input checked="" type="radio"/> | <input checked="" type="radio"/> | <input checked="" type="radio"/> (I) |
| alpelisib + binimetinib | <input checked="" type="radio"/> | <input checked="" type="radio"/> | <input checked="" type="radio"/> | <input checked="" type="radio"/> | <input checked="" type="radio"/> (I) |

* Most advanced phase (IV, III, II/III, II, I/II, I) is shown and multiple clinical trials may be available. See global clinical trials section in the pages to follow.

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Other mutations, copy number variations, or fusions that were detected but not classified by the Oncofocus Test as actionable by a known therapeutic targeted agent are not listed in the results section of this report.

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

BRAF p.(V600E) c.1799T>A (continued)

| Relevant Therapy | EMA | US-FDA | ESMO | US-NCCN | Global Clinical Trials* |
|--|-----|--------|------|---------|-------------------------|
| BAL-3833 | × | × | × | × | ● (I) |
| BGB-283 | × | × | × | × | ● (I) |
| BVD-523 | × | × | × | × | ● (I) |
| crizotinib + dasatinib | × | × | × | × | ● (I) |
| crizotinib + vemurafenib, sorafenib + vemurafenib | × | × | × | × | ● (I) |
| dabrafenib + midazolam + rosuvastatin calcium | × | × | × | × | ● (I) |
| dabrafenib + rabeprazole sodium + rifampicin | × | × | × | × | ● (I) |
| dabrafenib, dabrafenib + trametinib | × | × | × | × | ● (I) |
| everolimus + vemurafenib, temsirolimus + vemurafenib | × | × | × | × | ● (I) |
| RO-5126766 | × | × | × | × | ● (I) |
| vemurafenib + chemotherapy | × | × | × | × | ● (I) |
| vemurafenib + rifampicin | × | × | × | × | ● (I) |

PIK3CA p.(G1049R) c.3145G>C

| Relevant Therapy | EMA | US-FDA | ESMO | US-NCCN | Global Clinical Trials* |
|--|-----|--------|------|---------|-------------------------|
| sirolimus | × | × | × | × | ● (IV) |
| alpelisib + fulvestrant, fulvestrant + placebo | × | × | × | × | ● (III) |
| fulvestrant + placebo, taselisib + fulvestrant | × | × | × | × | ● (III) |
| alpelisib | × | × | × | × | ● (II) |

* Most advanced phase (IV, III, II/III, II, I/II, I) is shown and multiple clinical trials may be available. See global clinical trials section in the pages to follow.

Relevant Therapy Summary (continued)

PIK3CA p.(G1049R) c.3145G>C (continued)

| Relevant Therapy | EMA | US-FDA | ESMO | US-NCCN | Global Clinical Trials* |
|--|-----|--------|------|---------|-------------------------|
| alpelisib + letrozole, buparlisib + letrozole, letrozole + placebo | × | × | × | × | ● (II) |
| AZD-2014 + olaparib, AZD-5363 + olaparib, MK-1775 + olaparib, olaparib | × | × | × | × | ● (II) |
| letrozole + placebo, taselisib + letrozole | × | × | × | × | ● (II) |
| AZD-5363 + chemotherapy | × | × | × | × | ● (I/II) |
| taselisib, taselisib + fulvestrant, taselisib + letrozole | × | × | × | × | ● (I/II) |
| alpelisib + binimetinib | × | × | × | × | ● (I) |
| alpelisib + infigratinib | × | × | × | × | ● (I) |
| ARQ-092 | × | × | × | × | ● (I) |
| AZD-5363 | × | × | × | × | ● (I) |
| AZD-8835, AZD-8835 + fulvestrant | × | × | × | × | ● (I) |
| copanlisib | × | × | × | × | ● (I) |
| MSC-2363318A | × | × | × | × | ● (I) |
| palbociclib + pictilisib, palbociclib + taselisib | × | × | × | × | ● (I) |

ERBB2 mutation p.(G727A) c.2180G>C

| Relevant Therapy | EMA | US-FDA | ESMO | US-NCCN | Global Clinical Trials* |
|--|-----|--------|------|---------|-------------------------|
| afatinib | × | × | × | ○ | × |
| trastuzumab | × | × | × | ○ | × |
| alpelisib | × | × | × | × | ● (II) |
| everolimus, lapatinib, nilotinib, pazopanib, sorafenib | × | × | × | × | ● (II) |
| neratinib | × | × | × | × | ● (II) |
| neratinib, neratinib + fulvestrant, neratinib + trastuzumab, neratinib + trastuzumab + fulvestrant | × | × | × | × | ● (II) |
| poziotinib | × | × | × | × | ● (II) |
| everolimus + trastuzumab + letrozole | × | × | × | × | ● (I) |
| MSC-2363318A | × | × | × | × | ● (I) |
| pirotinib | × | × | × | × | ● (I) |
| pyrotinib | × | × | × | × | ● (I) |

Current EMA Information

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

EMA information is current as of 2016-04-01. For the most up-to-date information, search www.ema.europa.eu/ema.

BRAF p.(V600E) c.1799T>A

cobimetinib + vemurafenib

Cancer type: Melanoma

Label as of: 2016-02-12

Variant class: BRAF V600 mutation

Reference:

http://www.ema.europa.eu/docs/en_GB/document_library/EPAR_-_Product_Information/human/003960/WC500198563.pdf

dabrafenib + trametinib, trametinib

Cancer type: Melanoma

Label as of: 2016-04-21

Variant class: BRAF V600 mutation

Reference:

http://www.ema.europa.eu/docs/en_GB/document_library/EPAR_-_Product_Information/human/002643/WC500169657.pdf

dabrafenib, dabrafenib + trametinib

Cancer type: Melanoma

Label as of: 2015-11-20

Variant class: BRAF V600 mutation

Reference:

http://www.ema.europa.eu/docs/en_GB/document_library/EPAR_-_Product_Information/human/002604/WC500149671.pdf

vemurafenib

Cancer type: Melanoma

Label as of: 2016-04-27

Variant class: BRAF V600 mutation

Reference:

http://www.ema.europa.eu/docs/en_GB/document_library/EPAR_-_Product_Information/human/002409/WC500124317.pdf

Current US-FDA Information

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

US-FDA information is current as of 2016-04-01. For the most up-to-date information, search www.fda.gov.

BRAF p.(V600E) c.1799T>A

cobimetinib + vemurafenib

Cancer type: Melanoma

Label as of: 2015-11-10

Variant class: BRAF V600E mutation

Indications and usage:

COTELLIC™ is a kinase inhibitor indicated for the treatment of patients with unresectable or metastatic melanoma with a BRAF V600E or V600K mutation, in combination with vemurafenib.

Limitation of Use: COTELLIC™ is not indicated for treatment of patients with wild-type BRAF melanoma.

Reference:

http://www.accessdata.fda.gov/drugsatfda_docs/label/2015/206192s000lbl.pdf

dabrafenib + trametinib, trametinib

Cancer type: Melanoma

Label as of: 2015-11-20

Variant class: BRAF V600E mutation

Indications and usage:

MEKINIST™ is a kinase inhibitor indicated, as a single agent or in combination with dabrafenib, for the treatment of patients with unresectable or metastatic melanoma with BRAF V600E or V600K mutations as detected by an FDA approved test.

Limitation of use: MEKINIST is not indicated for treatment of patients who have received prior BRAF-inhibitor therapy.

Reference:

http://www.accessdata.fda.gov/drugsatfda_docs/label/2015/204114s004lbl.pdf

BRAF p.(V600E) c.1799T>A (continued)**○ dabrafenib, dabrafenib + trametinib**

Cancer type: Melanoma

Label as of: 2015-11-20

Variant class: BRAF V600E mutation

Indications and usage:

- TAFINLAR is a kinase inhibitor indicated as a single agent for the treatment of patients with unresectable or metastatic melanoma with BRAF V600E mutation as detected by an FDA-approved test.
- TAFINLAR is indicated, in combination with trametinib, for the treatment of patients with unresectable or metastatic melanoma with BRAF V600E or V600K mutations as detected by an FDA-approved test.

Limitation of Use: TAFINLAR is not indicated for treatment of patients with wild-type BRAF melanoma.

Reference:http://www.accessdata.fda.gov/drugsatfda_docs/label/2015/202806s004lbl.pdf**○ vemurafenib**

Cancer type: Melanoma

Label as of: 2015-08-11

Variant class: BRAF V600E mutation

Indications and usage:

ZELBORAF® is a kinase inhibitor indicated for the treatment of patients with unresectable or metastatic melanoma with BRAF V600E mutation as detected by an FDA-approved test.

Limitation of Use: ZELBORAF® is not indicated for treatment of patients with wild-type BRAF melanoma.

Reference:http://www.accessdata.fda.gov/drugsatfda_docs/label/2015/202429s008lbl.pdf

Current ESMO Information

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

ESMO information is current as of 2016-03-04. For the most up-to-date information, search www.esmo.org.

BRAF p.(V600E) c.1799T>A

BRAF inhibitor

Cancer type: Melanoma

Variant class: BRAF V600 mutation

ESMO Recommendation category: II, B

Population segment (Line of therapy):

- Metastatic (preferred) or primary tumour (First and second line therapy)

Reference: ESMO Clinical Practice Guidelines - ESMO-Cutaneous Melanoma [Ann Oncol (2015) 26 (suppl 5): v126-v132.]

BRAF inhibitor + MEK inhibitor

Cancer type: Melanoma

Variant class: BRAF V600 mutation

ESMO Recommendation category: II, B

Population segment (Line of therapy):

- Metastatic (preferred) or primary tumour (First and second line therapy)

Reference: ESMO Clinical Practice Guidelines - ESMO-Cutaneous Melanoma [Ann Oncol (2015) 26 (suppl 5): v126-v132.]

ipilimumab

Cancer type: Melanoma

Variant class: BRAF V600 mutation

ESMO Recommendation category: II, B

Population segment (Line of therapy):

- Metastatic (preferred) or primary tumour (First and second line therapy)

Reference: ESMO Clinical Practice Guidelines - ESMO-Cutaneous Melanoma [Ann Oncol (2015) 26 (suppl 5): v126-v132.]

BRAF p.(V600E) c.1799T>A (continued) **nivolumab**

Cancer type: Melanoma

Variant class: BRAF V600 mutation

ESMO Recommendation category: II, B

Population segment (Line of therapy):

- Metastatic (preferred) or primary tumour (First and second line therapy)

Reference: ESMO Clinical Practice Guidelines - ESMO-Cutaneous Melanoma [Ann Oncol (2015) 26 (suppl 5): v126-v132.]

 pembrolizumab

Cancer type: Melanoma

Variant class: BRAF V600 mutation

ESMO Recommendation category: II, B

Population segment (Line of therapy):

- Metastatic (preferred) or primary tumour (First and second line therapy)

Reference: ESMO Clinical Practice Guidelines - ESMO-Cutaneous Melanoma [Ann Oncol (2015) 26 (suppl 5): v126-v132.]

Current US-NCCN Information

- In this cancer type In other cancer type In this cancer type and other cancer types Contraindicated

US-NCCN information is current as of 2016-03-04. For the most up-to-date information, search www.nccn.org.
For NCCN International Adaptations & Translations, search www.nccn.org/global/international_adaptations.aspx.

BRAF p.(V600E) c.1799T>A

dabrafenib

Cancer type: Non-Small Cell Lung Cancer

Variant class: BRAF V600E mutation

US-NCCN Recommendation category: 2A

Population segment (Line of therapy):

- NSCLC (Not specified)

Reference: NCCN Guidelines® - NCCN-Non-Small Cell Lung Cancer [Version 4.2016]

dabrafenib + trametinib

Cancer type: Non-Small Cell Lung Cancer

Variant class: BRAF V600E mutation

US-NCCN Recommendation category: 2A

Population segment (Line of therapy):

- NSCLC (Not specified)

Reference: NCCN Guidelines® - NCCN-Non-Small Cell Lung Cancer [Version 4.2016]

vemurafenib

Cancer type: Non-Small Cell Lung Cancer

Variant class: BRAF V600E mutation

US-NCCN Recommendation category: 2A

Population segment (Line of therapy):

- NSCLC (Not specified)

Reference: NCCN Guidelines® - NCCN-Non-Small Cell Lung Cancer [Version 4.2016]

BRAF p.(V600E) c.1799T>A (continued) **cobimetinib + vemurafenib**

Cancer type: Melanoma

Variant class: BRAF V600 mutation

US-NCCN Recommendation category: 1

Population segment (Line of therapy):

- Metastatic or unresectable (First line therapy)

Reference: NCCN Guidelines® - NCCN-Melanoma [Version 2.2016]

 dabrafenib

Cancer type: Melanoma

Variant class: BRAF V600 mutation

US-NCCN Recommendation category: 1

Population segment (Line of therapy):

- Metastatic or unresectable disease (First-line therapy)

Reference: NCCN Guidelines® - NCCN-Melanoma [Version 2.2016]

 dabrafenib + trametinib

Cancer type: Melanoma

Variant class: BRAF V600 mutation

US-NCCN Recommendation category: 1

Population segment (Line of therapy):

- Metastatic or unresectable disease (First-line therapy) (preferred)

Reference: NCCN Guidelines® - NCCN-Melanoma [Version 2.2016]

 ipilimumab

Cancer type: Melanoma

Variant class: BRAF V600 mutation

US-NCCN Recommendation category: 1

Population segment (Line of therapy):

- Metastatic or unresectable disease, Disease progression or Maximum clinical benefit from BRAF targeted therapy (Second-line or Subsequent therapy)

Reference: NCCN Guidelines® - NCCN-Melanoma [Version 2.2016]

BRAF p.(V600E) c.1799T>A (continued) **nivolumab**

Cancer type: Melanoma

Variant class: BRAF V600 mutation

US-NCCN Recommendation category: 1

Population segment (Line of therapy):

- Metastatic or unresectable disease (First-line therapy)

Reference: NCCN Guidelines® - NCCN-Melanoma [Version 2.2016]

 trametinib

Cancer type: Melanoma

Variant class: BRAF V600 mutation

US-NCCN Recommendation category: 1

Population segment (Line of therapy):

- Disseminated disease (First-line therapy)

Reference: NCCN Guidelines® - NCCN-Melanoma [Version 2.2016]

 vemurafenib

Cancer type: Melanoma

Variant class: BRAF V600 mutation

US-NCCN Recommendation category: 1

Population segment (Line of therapy):

- Metastatic or unresectable disease (First-line therapy)

Reference: NCCN Guidelines® - NCCN-Melanoma [Version 2.2016]

 cobimetinib + vemurafenib

Cancer type: Melanoma

Variant class: BRAF V600 mutation

US-NCCN Recommendation category: 2A

Population segment (Line of therapy):

- Metastatic or unresectable disease, Disease progression or Maximum clinical benefit from BRAF targeted therapy (Second-line or Subsequent therapy)

Reference: NCCN Guidelines® - NCCN-Melanoma [Version 2.2016]

BRAF p.(V600E) c.1799T>A (continued) **dabrafenib**

Cancer type: Melanoma

Variant class: BRAF V600 mutation

US-NCCN Recommendation category: 2A

Population segment (Line of therapy):

- Metastatic or unresectable disease, Disease progression or Maximum clinical benefit from BRAF targeted therapy, if not used as first-line and not of the same (Second-line or Subsequent therapy)

Reference: NCCN Guidelines® - NCCN-Melanoma [Version 2.2016]

 dabrafenib + trametinib

Cancer type: Melanoma

Variant class: BRAF V600 mutation

US-NCCN Recommendation category: 2A

Population segment (Line of therapy):

- Metastatic or unresectable disease, Disease progression or Maximum clinical benefit from BRAF targeted therapy (Second-line or Subsequent therapy) (preferred)

Reference: NCCN Guidelines® - NCCN-Melanoma [Version 2.2016]

 ipilimumab + nivolumab

Cancer type: Melanoma

Variant class: BRAF V600 mutation

US-NCCN Recommendation category: 2A

Population segment (Line of therapy):

- Metastatic or unresectable disease (First-line therapy)
- Metastatic or unresectable disease, Disease progression or Maximum clinical benefit from BRAF targeted therapy (Second-line or Subsequent therapy)

Reference: NCCN Guidelines® - NCCN-Melanoma [Version 2.2016]

BRAF p.(V600E) c.1799T>A (continued) **nivolumab**

Cancer type: Melanoma

Variant class: BRAF V600 mutation

US-NCCN Recommendation category: 2A

Population segment (Line of therapy):

- Metastatic or unresectable disease, Disease progression or Maximum clinical benefit from BRAF targeted therapy (Second-line or Subsequent therapy)

Reference: NCCN Guidelines® - NCCN-Melanoma [Version 2.2016]

 pembrolizumab

Cancer type: Melanoma

Variant class: BRAF V600 mutation

US-NCCN Recommendation category: 2A

Population segment (Line of therapy):

- Metastatic or unresectable disease (First-line therapy)
- Metastatic or unresectable disease, Disease progression or Maximum clinical benefit from BRAF targeted therapy (Second-line or Subsequent therapy)

Reference: NCCN Guidelines® - NCCN-Melanoma [Version 2.2016]

 vemurafenib

Cancer type: Melanoma

Variant class: BRAF V600 mutation

US-NCCN Recommendation category: 2A

Population segment (Line of therapy):

- Metastatic or unresectable disease, Disease progression or Maximum clinical benefit from BRAF targeted therapy (Second-line or Subsequent therapy)

Reference: NCCN Guidelines® - NCCN-Melanoma [Version 2.2016]

BRAF p.(V600E) c.1799T>A (continued)**⊘ cetuximab**

Cancer type: Colorectal Cancer

Variant class: BRAF V600 mutation

Summary:

NCCN Guidelines® do not contain a recommendation regarding BRAF V600 mutations and cetuximab in Colon Cancer, but include the following evidentiary statements:

- "Evidence increasingly suggest that BRAF V600E mutations makes response to panitumumab or cetuximab highly unlikely, as a single agent, or in combination with cytotoxic chemotherapy"

Reference: NCCN Guidelines® - NCCN-Colon Cancer [Version 2.2016]**⊘ panitumumab**

Cancer type: Colorectal Cancer

Variant class: BRAF V600 mutation

Summary:

NCCN Guidelines® do not contain a recommendation regarding BRAF V600 mutations and panitumumab in Colon Cancer, but include the following evidentiary statements:

"Evidence increasingly suggest that BRAF V600E mutations makes response to panitumumab or cetuximab highly unlikely, as a single agent, or in combination with cytotoxic chemotherapy"

Reference: NCCN Guidelines® - NCCN-Colon Cancer [Version 2.2016]

Current US-NCCN Information

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

US-NCCN information is current as of 2016-03-04. For the most up-to-date information, search www.nccn.org.
For NCCN International Adaptations & Translations, search www.nccn.org/global/international_adaptations.aspx.

ERBB2 mutation

afatinib

Cancer type: Non-Small Cell Lung Cancer

Variant class: ERBB2 mutation

US-NCCN Recommendation category: 2B

Population segment (Line of therapy):

- NSCLC (Not specified)

Reference: NCCN Guidelines® - NCCN-Non-Small Cell Lung Cancer [Version 4.2016]

trastuzumab

Cancer type: Non-Small Cell Lung Cancer

Variant class: ERBB2 mutation

US-NCCN Recommendation category: 2B

Population segment (Line of therapy):

- NSCLC (Not specified)

Reference: NCCN Guidelines® - NCCN-Non-Small Cell Lung Cancer [Version 4.2016]

Current Global Clinical Trials Information

Global Clinical Trials information is current as of 2016-03-01. For the most up-to-date information regarding a particular trial, search www.clinicaltrials.gov by NCT ID or search local clinical trials authority website by local identifier listed in 'Other identifiers'.

BRAF p.(V600E) c.1799T>A

NCT02091141

My Pathway: An Open Label Phase IIa Study Evaluating Trastuzumab/Pertuzumab, Erlotinib, Vemurafenib, and Vismodegib in Patients Who Have Advanced Solid Tumors With Mutations or Gene Expression Abnormalities Predictive of Response to One of These Agents

Cancer type: Unspecified Solid Tumor

Variant class: BRAF activating mutation

Other identifiers: 1403013519, 2014-0459, AAAN9701, ML28897, ML28897/PRO 02, ML28897PRO/02, My Pathway, TrialTroveID-205033

Population segments: Second line or greater/Refractory/Relapsed, Stage IV

Exclusion criteria variant classes: EGFR exon 20 mutation, RAS mutation, ERBB2 amplification

Phase: II

Therapies: erlotinib, pertuzumab + trastuzumab, vemurafenib, vismodegib

Country: United States

US States: AR, AZ, CA, CO, FL, GA, IL, MD, MN, NC, ND, NY, OH, OK, OR, PA, SD, TN, TX, VA, WA

US Contact: Reference Study ID Number: ML28897 [888-662-6728; global.roche.genentechtrials@roche.com]

NCT01543698

A Phase Ib/II, Multicenter, Open-label, Dose Escalation Study of LGX818 in Combination With MEK162 and LEE-011 in Adult Patients With BRAF V600-Dependent Advanced Solid Tumors

Cancer type: Unspecified Solid Tumor

Variant class: BRAF V600 mutation

Other identifiers: 12-193, 2012-0238, CMEK162X2110, EudraCT Number:2011-005875-17, J12117, MCC#17318, NCI-2012-00964, TrialTroveID-163520

Population segments: Recurrent, Second line or greater/Refractory/Relapsed, Stage III, Stage IV

Phase: I/II

Therapies: binimetinib + encorafenib, binimetinib + encorafenib + ribociclib

Countries: Australia, Belgium, Canada, France, Italy, Spain, Switzerland

BRAF p.(V600E) c.1799T>A (continued)**NCT01787500**

A Phase I Trial of Vemurafenib in Combination With Cetuximab and Irinotecan in Patients with BRAF V600 Mutant Advanced Solid Malignancies

Cancer type: Unspecified Solid Tumor

Variant class: BRAF V600 mutation

Other identifiers: 2012-0748, NCI-2013-00541, TrialTroveID-181751

Population segments: Line of therapy N/A, Stage III, Stage IV

Other inclusion criteria: KRAS wild type

Exclusion criteria variant classes: KRAS G12 mutation, KRAS G13 mutation

Phase: I/II

Therapy: cetuximab + vemurafenib + chemotherapy

Country: United States

US State: TX

US Contact: Dr. David S. Hong [713-593-1930]

NCT02428712

A Phase I/IIa Study to Assess the Safety, Pharmacokinetics, and Pharmacodynamics of PLX8394 in Patients With Advanced, Unresectable Solid Tumors

Cancer type: Unspecified Solid Tumor

Variant class: BRAF activating mutation

Other identifiers: PLX120-03, TrialTroveID-256645

Population segments: Second line or greater/Refractory/Relapsed, Stage III, Stage IV

Phase: I/II

Therapy: PLX-8394

Country: United States

US States: AZ, MI, TX, UT

US Contact: Multiple contacts: See www.clinicaltrials.gov for complete list of contacts.

No NCT ID - see other identifier(s)

A Phase I/II Study of LNP3794 in Patients with Advanced Solid Tumors having RAS/ BRAF Mutations

Cancer type: Unspecified Solid Tumor

Variant class: BRAF mutation

Other identifier: TrialTroveID-250171

Population segments: Line of therapy N/A, Stage III, Stage IV

Phase: I/II

Therapy: LNP3794

Country: United Kingdom

BRAF p.(V600E) c.1799T>A (continued)**No NCT ID - see other identifier(s)**

A Phase 1/2, Open-Label, Multicenter, Dose Escalation and Dose Expansion Study of NKTR-214 in Subjects with Locally Advanced or Metastatic Solid Tumor Malignancies

Cancer type: Unspecified Solid Tumor

Variant class: BRAF mutation

Other identifiers: 2015-0573, TrialTroveID-258750

Population segments: Adenocarcinoma, First line, HER2 negative, Second line or greater/Refractory/Relapsed, Squamous Cell, Stage III, Stage IV, Triple receptor negative

Phase: I/II

Therapy: NKTR-214

Country: United States

US State:

US Contact: MD Anderson Cancer Center For Clinical Trial Enrollment [713-792-2921]

NCT02082665

An Open-label Phase I Study to Evaluate the Effects of Dabrafenib (GSK2118436) on the Single Dose Pharmacokinetics of an OATP1B1/1B3 Substrate and of a CYP3A4 Substrate in Subjects With BRAF V600 Mutation Positive Tumors

Cancer type: Unspecified Cancer

Variant class: BRAF V600 mutation

Other identifiers: 200919, TrialTroveID-204485

Population segments: (N/A), Line of therapy N/A

Phase: I

Therapy: dabrafenib + midazolam + rosuvastatin calcium

Country: Spain

NCT01954043

An Open-label Study to Evaluate the Effects of a Potent CYP3A4 Inducer and the Effects of a pH Elevating Agent on the Repeat Dose Pharmacokinetics of Dabrafenib (GSK2118436) in Subjects With BRAF V600 Mutation Positive Tumors

Cancer type: Unspecified Solid Tumor

Variant class: BRAF V600 mutation

Other identifiers: 170049, 200072, Eucr Number: 2014-003093-17, TrialTroveID-194828

Population segments: (N/A), Line of therapy N/A

Phase: I

Therapy: dabrafenib + rabeprazole sodium + rifampicin

Countries: Australia, United States

US States: TX, WA

US Contact: US GSK Clinical Trials Call Center [877-379-3718; GSKClinicalSupportHD@gsk.com]

BRAF p.(V600E) c.1799T>A (continued)**NCT01767623**

An Open Label, Phase I Study to Evaluate the Impact of Severe Hepatic Impairment on the Pharmacokinetics and Safety of Vemurafenib in BRAF V600 mutation Positive Cancer Patients

Cancer type: Unspecified Solid Tumor

Variant class: BRAF V600 mutation

Other identifiers: 1803-7, EudraCT Number: 2012-003820-18, GO28053, IRAS ID: 120756, PER-052-13, TrialTroveID-152167

Population segments: Second line or greater/Refractory/Relapsed, Stage III, Stage IV

Phase: I

Therapy: vemurafenib

Countries: Australia, Israel, Turkey

NCT02441465

A Phase I, Open-Label, Absolute Bioavailability Study of Vemurafenib in Patients With BRAF^{V600} Mutation-Positive Malignancies

Cancer type: Unspecified Solid Tumor

Variant class: BRAF V600 mutation

Other identifiers: EudraCT Number: 2013-004144-34, GO28395, TrialTroveID-257287

Population segments: Second line or greater/Refractory/Relapsed, Stage III, Stage IV

Phase: I

Therapy: vemurafenib

Country: Hungary

NCT01765543

A Phase I, Open-Label, Multicenter, Three-Period, One-Sequence Study To Investigate The Effect Of Rifampin On The Pharmacokinetics Of A Single Oral Dose Of 960 Mg Of Vemurafenib

Cancer type: Unspecified Solid Tumor

Variant class: BRAF V600 mutation

Other identifiers: EudraCT Number: 2012-003142-33, GO28052, TrialTroveID-179892

Population segments: Second line or greater/Refractory/Relapsed, Stage III, Stage IV

Phase: I

Therapy: vemurafenib + rifampicin

Countries: Brazil, Croatia, Egypt, South Africa, United States

US States: AR, TX

US Contact: Reference Study ID Number: GO28052 [888-662-6728; global.roche.genentechtrials@roche.com]

BRAF p.(V600E) c.1799T>A (continued)**NCT01877811**

An Open-Label, Phase 1/1b, Single-Agent Study of RXDX-105 in Patients With Advanced Solid Tumors

Cancer type: Unspecified Solid Tumor

Variant class: BRAF mutation

Other identifiers: C32496/1105, NCI-2013-01795, RXDX-105-01, TrialTroveID-167849

Population segments: KRAS, Second line or greater/Refractory/Relapsed, Squamous Cell, Stage III, Stage IV

Other inclusion criteria: KRAS wild type

Exclusion criteria variant classes: RET V804 mutation, EGFRi sensitizing mutation

Phase: I

Therapy: AB-024

Country: United States

US States: CA, FL, MI, MO, PA

US Contact: Teva US Medical Information [800-896-5855]

NCT01449058

A Phase Ib Open-label, Multi-center, Dose Escalation and Expansion Study of Orally Administered MEK162 Plus BYL719 in Adult Patients With Selected Advanced Solid Tumors

Cancer type: Unspecified Solid Tumor

Variant classes: BRAF mutation & PIK3CA mutation

Other identifiers: 11-490, 15-039, 2013-0813, CMEK162X2109, CSET 1840, EudraCT Number: 2011-002578-21, HCI 53590, MSKCC-11-117, NCI-2012-00874, Novartis#CMEK162X2109, RECF2113, TrialTroveID-154495

Population segments: HER2 negative, High risk, Second line or greater/Refractory/Relapsed, Stage II, Stage III, Stage IV, Triple receptor negative

Phase: I

Therapy: alpelisib + binimetinib

Countries: Australia, France, Spain, Switzerland, United States

US States: CA, IL, MA, NY, UT

US Contact: Novartis Pharmaceuticals [862-778-8300]

BRAF p.(V600E) c.1799T>A (continued)**NCT02437227**

A Phase 1, First in Man, Dual Centre, Open-label Dose Escalation Study With Expansion to Evaluate the Safety, Tolerability, Pharmacokinetics and Pharmacodynamics of CCT3833 (BAL3833), a panRAF Inhibitor, Given Orally in Patients With Advanced Solid Tumours, Including Metastatic Melanoma

Cancer type: Unspecified Solid Tumor

Variant class: BRAF mutation

Other identifiers: 4232, PanRAF, TrialTroveID-257046

Population segments: Line of therapy N/A, Stage III, Stage IV

Phase: I

Therapy: BAL-3833

Country: United Kingdom

No NCT ID - see other identifier(s)

A Phase Ib, Multi-Center Study to Evaluate the Efficacy of BGB-283 in Patients with Solid Tumors

Cancer type: Unspecified Solid Tumor

Variant class: BRAF mutation

Other identifier: TrialTroveID-261285

Population segments: (N/A), Line of therapy N/A

Phase: I

Therapy: BGB-283

Countries: Australia, New Zealand

NCT02610361

A Phase IA/IB, Open-Label, Multiple-Dose, Dose Escalation and Expansion Study to Investigate the Safety, Pharmacokinetics and Preliminary Antitumor Activities of the B RAF Inhibitor BGB 283 in Subjects With Solid Tumors

Cancer type: Unspecified Solid Tumor

Variant class: BRAF mutation

Other identifiers: ACTRN12614001176651, BGB-283-AU-001, TrialTroveID-268375

Population segments: First line, Stage III, Stage IV

Phase: I

Therapy: BGB-283

Countries: Australia, New Zealand

BRAF p.(V600E) c.1799T>A (continued)**NCT01781429**

Phase I Dose-Escalation, Safety, Pharmacokinetic and Pharmacodynamic Study of BVD-523 in Patients With Advanced Malignancies

Cancer type: Unspecified Solid Tumor

Variant class: BRAF mutation

Other identifiers: 13-010, 13-254, 2013-0574, AAAP2107, BVD-523-01, REFMAL 286 IST, TrialTroveID-180584, VICCPH1375

Population segments: Second line or greater/Refractory/Relapsed, Stage III, Stage IV

Phase: I

Therapy: BVD-523

Country: United States

US States: CA, CT, FL, MA, MO, NY, TN, TX

US Contact: Multiple contacts: See www.clinicaltrials.gov for complete list of contacts.

NCT01744652

A Phase I Trial of Dasatinib in Combination With Crizotinib in Patients With Advanced Malignancies

Cancer type: Unspecified Solid Tumor

Variant class: BRAF mutation

Other identifiers: 2012-0721, NCI-2013-00071, TrialTroveID-178941

Population segments: Aggressive, Classical, Hormone refractory, Indolent, Metastatic, Nodular lymphocyte-predominant, Second line or greater/Refractory/Relapsed, Stage IV, Unresectable

Phase: I

Therapy: crizotinib + dasatinib

Country: United States

US State: TX

US Contact: Dr. David S. Hong [800-392-1611]

NCT01531361

A Phase I Trial of Sorafenib (CRAF, BRAF, KIT, RET, VEGFR, PDGFR Inhibitor) or Crizotinib (MET, ALK, ROS1 Inhibitor) in Combination With Vemurafenib (BRAF Inhibitor) in Patients With Advanced Malignancies

Cancer type: Unspecified Cancer

Variant class: BRAF mutation

Other identifiers: 2011-1183, NCI-2012-00217, TrialTroveID-162168

Population segments: Adenocarcinoma, Papillary, Second line or greater/Refractory/Relapsed, Stage III, Stage IV

Phase: I

Therapies: crizotinib + vemurafenib, sorafenib + vemurafenib

Country: United States

US State: TX

US Contact: Dr. Filip Janku [713-563-1930]

BRAF p.(V600E) c.1799T>A (continued)**NCT01231594**

A Rollover Study to provide Continued Treatment with GSK2118436 to Subjects with BRAF Mutation-Positive Tumors

Cancer type: Unspecified Solid Tumor

Variant class: BRAF mutation

Other identifiers: 114144, 12-016, 2010-0801, 44629, BRF114144, Eudra CT Number: 2011-000883-83, F14020, HCI 44629, IRAS ID 95276, NCI-2011-02757, OSU-11024, REFMAL 223, TrialTroveID-137250, VICCMEL1209

Population segments: Line of therapy N/A, Stage IV

Phase: I

Therapies: dabrafenib, dabrafenib + trametinib

Countries: Australia, Italy, Spain, United Kingdom, United States

US States: AZ, CA, FL, MI, NY, OH, OK, PA, SC, TN, TX, UT, WA

US Contact: US GSK Clinical Call Center [877-379-3718; GSKClinicalSupportHD@gsk.com]

NCT01596140

A Phase I Dose-Escalation Study of the BRAF Inhibitor Vemurafenib (Zelboraf) in Combination With an mTOR Inhibitor, Everolimus (Afinitor) or Temozolomide (Torisel), in Subjects With Advanced Cancer

Cancer type: Unspecified Solid Tumor

Variant class: BRAF mutation

Other identifiers: 2012-0153, TrialTroveID-167369

Population segments: Second line or greater/Refractory/Relapsed, Stage III, Stage IV

Phase: I

Therapies: everolimus + vemurafenib, temsirolimus + vemurafenib

Country: United States

US State: TX

US Contact: Dr. Vivek Subbiah [713-794-1226]

NCT02407509

A Phase I Trial of RO5126766 (a Dual RAF/MEK Inhibitor) Exploring Intermittent, Oral Dosing Regimens in Patients With Solid Tumours or Multiple Myeloma

Cancer type: Unspecified Solid Tumor

Variant class: BRAF mutation

Other identifiers: CCR3808, DDU RAF/MEK, EudraCT Number: 2012-001040-22, TrialTroveID-206542

Population segments: (N/A), Second line or greater/Refractory/Relapsed

Phase: I

Therapy: RO-5126766

Country: United Kingdom

BRAF p.(V600E) c.1799T>A (continued)**NCT01636622**

Phase I Study of the Combination of Vemurafenib With Carboplatin and Paclitaxel in Patients With Advanced Malignancy

Cancer type: Unspecified Solid Tumor

Variant class: BRAF mutation

Other identifiers: 2012-0394, NCI-2012-01221, TrialTroveID-171156

Population segments: Aggressive, Classical, Indolent, Nodular lymphocyte-predominant, Papillary, Second line or greater/Refractory/Relapsed, Stage III, Stage IV

Phase: I

Therapy: vemurafenib + chemotherapy

Country: United States

US State: TX

US Contact: MD Anderson Cancer Center [800-392-1611]

PIK3CA p.(G1049R) c.3145G>C**NCT02437318**

A Phase III Randomized Double-blind, Placebo Controlled Study of Alpelisib in Combination with Fulvestrant for Men and Postmenopausal Women with Hormone Receptor Positive, HER2-negative Advanced Breast Cancer which Progressed on or after Aromatase Inhibitor Treatment

Cancer type: Breast Cancer

Variant class: PIK3CA mutation

Other identifiers: CBYL719C2301, EudraCT Number: 2015-000340-42, NCI-2015-01171, SOLAR-1, TrialTroveID-257091

Population segments: First line, HER2 negative, Second line or greater/Refractory/Relapsed, Stage III, Stage IV

Other inclusion criteria: ERBB2 wild type, ER positive and/or PR positive

Phase: III

Therapies: alpelisib + fulvestrant, fulvestrant + placebo

Countries: Austria, Belgium, Canada, Czech Republic, France, Germany, Greece, Hong Kong, Hungary, Israel, Italy, Japan, Lebanon, Netherlands, Republic of Korea, Spain, Sweden, Taiwan, Thailand, United States

US States: CA, FL, IL, IN, KS, LA, MA, MD, MI, MO, NJ, OH, SD, TN, TX, UT, VA, WA

US Contact: Novartis Pharmaceuticals [888-669-6682]

PIK3CA p.(G1049R) c.3145G>C (continued)**NCT02313948**

A Phase III, Double-blind, Placebo Controlled, Randomized Study of Taselisib plus Fulvestrant Versus Placebo Plus Fulvestrant in Postmenopausal Women with Estrogen receptor-positive and Her2-negative Locally Advanced or Metastatic Breast Cancer who have Disease Recurrence or Progression During or After Aromatase Inhibitor Therapy

Cancer type: Breast Cancer

Variant class: PIK3CA mutation

Other identifiers: 15-111, 15-153, 15-ROC-5, BRTPIPER, CT714, EudraCT Number: 2014-003185-25, GO29058, NCI-2015-01649, REec-2015-1381, SANDPIPER, TrialTroveID-222349

Population segments: HER2 negative, Second line or greater/Refractory/Relapsed, Stage III, Stage IV

Other inclusion criteria: ERBB2 wild type, ER positive

Exclusion criteria variant class: ERBB2 amplification

Phase: III

Therapies: fulvestrant + placebo, taselisib + fulvestrant

Countries: Australia, Austria, Bulgaria, Canada, Czech Republic, France, Germany, Greece, Italy, Mexico, Netherlands, Peru, Poland, Portugal, Republic of Korea, Romania, Russian Federation, Spain, Sweden, Turkey, United States

US States: AZ, CA, GA, IL, MA, MD, MN, MO, NJ, NY, OR

US Contact: Reference Study ID Number: GO29058 [888-662-6728; global.roche.genentechtrials@roche.com]

NCT02506556

A Phase II Exploratory, Open-label, Single Arm Study of BYL719 Monotherapy, a Selective Phosphatidylinositol 3-kinase (PI3K) Alpha Inhibitor, in Adult Patients With Advanced Breast Cancer Progressing After First Line Therapy.

Cancer type: Breast Cancer

Variant class: PIK3CA mutation

Other identifiers: LL14/02, PIKNIC, TrialTroveID-261995

Population segments: Second line or greater/Refractory/Relapsed, Stage III, Stage IV, Triple receptor negative

Exclusion criteria variant class: ERBB2 amplification

Phase: II

Therapy: alpelisib

Country: Australia

PIK3CA p.(G1049R) c.3145G>C (continued)**NCT01923168**

A Phase II Randomized, Double-blind Placebo Controlled, Study of Letrozole with or without BYL719 or Buparlisib, for the Neoadjuvant Treatment of Postmenopausal Women with Hormone Receptor-positive HER2-negative Breast Cancer

Cancer type: Breast Cancer

Variant class: PIK3CA mutation

Other identifiers: 00054363, 041311, 14752, 20132066, ABCSG-40, BRTA2201, CBYL719A2201, CTMS# 15-2039, EudraCT Number: 2013-001862-41, J13178, NEO-ORB, NL46099.058.13, P50 CA098131, REec-2013-0617, TBCRC025, TrialTroveID-192163, USO 13076, USONCOLOGY 13076, VICCBRE1393

Population segments: HER2 negative, Neoadjuvant, Stage I, Stage II, Stage III

Other inclusion criteria: ERBB2 wild type, ER positive and/or PR positive

Phase: II

Therapies: alpelisib + letrozole, buparlisib + letrozole, letrozole + placebo

Countries: Australia, Austria, Belgium, Brazil, Bulgaria, Canada, Colombia, Czech Republic, Germany, Hong Kong, Israel, Italy, Lebanon, Netherlands, Spain, United States

US States: AL, AR, CA, GA, MA, MD, MN, NC, NJ, OR, TN, TX, VA, WA

US Contact: Novartis Pharmaceuticals [888-669-6682]

NCT02273973

A Phase II Randomized, Double-Blind, Parallel Cohort Study of Neoadjuvant Letrozole + GDC-0032 Versus Letrozole + Placebo in Post-Menopausal Women With ER+/HER2- Primary Breast Cancer

Cancer type: Breast Cancer

Variant class: PIK3CA mutation

Other identifiers: 15-020, 2014-0580, ABCSG 38, BIG-3-13, EORTC-1319-BCG, EORTC-1319-BCG - Lorelei, EudraCT Number: 2013-000568-28, GO28888, IBCSG 46-13 LORELEI, LORELEI, NCI-2014-02653, SOLTI 1205, TrialTroveID-210342, UKCRN ID: 16325

Population segments: HER2 negative, Neoadjuvant, Stage I, Stage II, Stage III

Other inclusion criteria: ERBB2 wild type, ER positive

Phase: II

Therapies: letrozole + placebo, taselisib + letrozole

Countries: Australia, Austria, Belgium, Chile, Czech Republic, El Salvador, France, Germany, Guatemala, Hungary, Italy, Panama, Poland, Portugal, Republic of Korea, Spain, Switzerland, United Kingdom, United States

US States: CA, MA, NY, TX

US Contact: Reference Study ID Number: GO28888 [888-662-6728; global.roche-genentechtrials@roche.com]

PIK3CA p.(G1049R) c.3145G>C (continued)**NCT01625286**

A Phase I/II Study of AZD5363 Combined With Paclitaxel in Patients With Advanced or Metastatic Breast Cancer. Comprising a Safety Run-In and a Placebo-controlled Randomised Expansion in ER+ve Patients Stratified by PIK3CA Mutation Status

Cancer type: Breast Cancer

Variant class: PIK3CA mutation

Other identifiers: 12/LO/0803, 15/P/019, 99497, B214, BEECH, CR1421AZ, D3610C00002, EudraCT Number: 2011-006312-31, JapicCTI-142468, NL40149.031.12, PER-092-13, RD12/0036/0006, RECF1937, TrialTroveID-170030

Population segments: First line, HER2 negative, Second line or greater/Refractory/Relapsed, Stage III, Stage IV

Other inclusion criteria: ERBB2 wild type, ER positive

Phase: I/II

Therapy: AZD-5363 + chemotherapy

Countries: Canada, Czech Republic, France, Japan, Mexico, Peru, Republic of Korea, Singapore, Spain, United Kingdom

NCT01296555

An Open-Label, Phase I/II, Dose Escalation Study Evaluating the Safety and Tolerability of GDC-0032 in Patients With Locally Advanced or Metastatic Solid Tumors and in Combination With Endocrine Therapy in Patients With Locally Advanced or Metastatic Hormone Receptor-Positive Breast Cancer

Cancer type: Breast Cancer

Variant class: PIK3CA mutation

Other identifiers: 11-010, 13-149, 2013-0375, 201405133, EudraCT Number: 2012-002042-21, GO00886, JapicCTI-142630, JO29196, NCI-2011-00912, PMT4979g, TrialTroveID-142345, VICCPHI1248

Population segments: HER2 negative, HER2 positive, Second line or greater/Refractory/Relapsed, Stage III, Stage IV

Other inclusion criteria: ERBB2 wild type, ER positive

Phase: I/II

Therapies: tasisib, tasisib + fulvestrant, tasisib + letrozole

Countries: Canada, Spain, United States

US States: AZ, CT, FL, IL, MI, NY, OK, TN, TX, WA

US Contact: Reference Study ID Number: PMT4979g [888-662-6728; global.roche.genentechtrials@roche.com]

PIK3CA p.(G1049R) c.3145G>C (continued)**NCT01226316**

A Phase I, Open-Label, Multicentre Study to Assess the Safety, Tolerability, Pharmacokinetics and Preliminary Anti-tumour Activity of Ascending Doses of AZD5363 Under Adaptable Dosing Schedules in Patients with Advanced Solid Malignancies

Cancer type: Breast Cancer

Variant class: PIK3CA mutation

Other identifiers: 102084, 14-214, 14-430, 2014-0160, CR1322AZ, D3610C00001, EudraCT Number: 2010-022167-35, JapicCTI-152844, M10AZD, NCI-2014-01803, NL33755.031.10, P1TGIVEN, TrialTroveID-136773

Population segments: HER2 positive, Hormone refractory, Second line or greater/Refractory/Relapsed, Stage III, Stage IV

Other inclusion criteria: ER positive

Phase: I

Therapy: AZD-5363

Countries: Canada, France, Italy, Japan, Netherlands, Singapore, Spain, United Kingdom, United States

US States: CA, CO, CT, MA, NY, OK, OR, SC, TN, TX

US Contact: AstraZeneca Clinical Study Information [800-236-9933; information.center@astrazeneca.com]

NCT02260661

A phase I, open-label, multicentre, dose-escalation study to investigate the safety and pharmacokinetics of AZD8835 in patients with advanced solid tumours

Cancer type: Breast Cancer

Variant class: PIK3CA mutation

Other identifiers: D6140C00001, NCI-2015-01860, TrialTroveID-218498

Population segments: First line, HER2 negative, Stage III, Stage IV

Other inclusion criteria: ERBB2 wild type, ER positive

Phase: I

Therapies: AZD-8835, AZD-8835 + fulvestrant

Countries: United Kingdom, United States

US States: CO, TN

US Contact: AstraZeneca Clinical Study Information Center [877-240-9479; information.center@astrazeneca.com]

PIK3CA p.(G1049R) c.3145G>C (continued)**NCT02389842**

PIPA: A Phase Ib Study to Assess the Safety, Tolerability and Efficacy of the PI3K Inhibitors, Taselisib (GDC-0032) or Pictilisib (GDC-0941), in Combination With Palbociclib, With the Subsequent Addition of Fulvestrant in PIK3CA-mutant Breast Cancers

Cancer type: Breast Cancer

Variant class: PIK3CA mutation

Other identifiers: CCR4191, EudraCT Number: 2014-002658-37, IRAS ID 159997, PIPA, TrialTroveID-253778

Population segments: HER2 negative, Second line or greater/Refractory/Relapsed, Stage III, Stage IV

Other inclusion criteria: ER negative

Phase: I

Therapies: palbociclib + pictilisib, palbociclib + tasisib

Country: United Kingdom

NCT02155582

A Phase I Pharmacodynamic Study of Copanlisib (BAY 80-6946) as Monotherapy in Patients with Non-Hodgkin's Lymphoma and Solid Tumors

Cancer type: Breast Cancer

Variant class: PIK3CA aberration

Other identifiers: 16790, EudraCT Number: 2013-004746-42, TrialTroveID-210261

Population segments: Aggressive, Diffuse large B-cell lymphoma (DLBCL), Follicular lymphoma (FL), Indolent, Mantle cell lymphoma (MCL), Peripheral T-cell lymphoma (PTCL), Second line or greater/Refractory/Relapsed, Squamous Cell, Stage III, Stage IV, Waldenstrom's macroglobulinemia (WM)

Phase: I

Therapy: copanlisib

Countries: Belgium, France

NCT02449564

The Pilot Study Evaluate the Safety and Efficacy of Sirolimus in Patients With PIK3CA Mutation and/or PIK3CA Amplification Refractory Solid Tumors

Cancer type: Unspecified Solid Tumor

Variant class: PIK3CA mutation

Other identifiers: 2014-10-030, TrialTroveID-257741

Population segments: (N/A), Second line or greater/Refractory/Relapsed

Phase: IV

Therapy: sirolimus

Country: Republic of Korea

PIK3CA p.(G1049R) c.3145G>C (continued)**NCT02576444**

A Phase II Study of the PARP Inhibitor Olaparib (AZD2281) Alone and in Combination With AZD1775, AZD5363, or AZD2014 in Advanced Solid Tumors

Cancer type: Unspecified Solid Tumor

Variant class: PIK3CA mutation

Other identifiers: 1508016363, OLAPCO, TrialTroveID-266161

Population segments: First line, Second line or greater/Refractory/Relapsed, Stage IV

Phase: II

Therapies: AZD-2014 + olaparib, AZD-5363 + olaparib, MK-1775 + olaparib, olaparib

Country: United States

US State: CT

US Contact: Multiple contacts: See www.clinicaltrials.gov for complete list of contacts.

NCT01449058

A Phase Ib Open-label, Multi-center, Dose Escalation and Expansion Study of Orally Administered MEK162 Plus BYL719 in Adult Patients With Selected Advanced Solid Tumors

Cancer type: Unspecified Solid Tumor

Variant classes: BRAF mutation & PIK3CA mutation

Other identifiers: 11-490, 15-039, 2013-0813, CMEK162X2109, CSET 1840, EudraCT Number: 2011-002578-21, HCI 53590, MSKCC-11-117, NCI-2012-00874, Novartis#CMEK162X2109, RECF2113, TrialTroveID-154495

Population segments: HER2 negative, High risk, Second line or greater/Refractory/Relapsed, Stage II, Stage III, Stage IV, Triple receptor negative

Phase: I

Therapy: alpelisib + binimetinib

Countries: Australia, France, Spain, Switzerland, United States

US States: CA, IL, MA, NY, UT

US Contact: Novartis Pharmaceuticals [862-778-8300]

NCT01928459

A Phase Ib, Open-label Study of Oral BGJ398 in Combination with Oral BYL719 in Adult Patients with Select Advanced Solid Tumors

Cancer type: Unspecified Solid Tumor

Variant class: PIK3CA mutation

Other identifiers: 13-246, CBGJ398X2102, CT610, CTBE2014000264, EudraCT Number: 2013-001018-14, NCI-2013-01763, NL47080.031.13, SAKK 69/13, TrialTroveID-192837

Population segments: Second line or greater/Refractory/Relapsed, Stage III, Stage IV

Other inclusion criteria: FGFR2 wild type, FGFR1 wild type, FGFR3 wild type

Phase: I

Therapy: alpelisib + infigratinib

Countries: Australia, Belgium, France, Germany, Italy, Republic of Korea, Spain, Switzerland, United States

US States: FL, MI, MO, NY, TN, TX

US Contact: Novartis Pharmaceuticals [888-669-6682]

PIK3CA p.(G1049R) c.3145G>C (continued)**NCT01473095**

A Phase I Dose Escalation Study of ARQ 092 in Adult Subjects With Advanced Solid Tumors and Recurrent Malignant Lymphoma

Cancer type: Unspecified Solid Tumor

Variant class: PIK3CA mutation

Other identifiers: ARQ 092-101, NCI-2015-00308, TrialTroveID-156858

Population segments: Aggressive, Classical, Follicular lymphoma (FL), Hormone refractory, Indolent, Localized, Locally advanced, Metastatic, Nodular lymphocyte-predominant, Second line or greater/Refractory/Relapsed, Small lymphocytic lymphoma (SLL), Stage III, Stage IV

Phase: I

Therapy: ARQ-092

Country: United States

US States: AZ, FL, GA, IN, TX

US Contact: ArQule, Inc. [781-994-0300; ClinicalTrials@arqule.com]

NCT01971515

A Phase I, First-in-Human, Dose Escalation Trial of MSC2363318A, a Dual p70S6K/Akt Inhibitor, in Subjects With Advanced Malignancies

Cancer type: Unspecified Solid Tumor

Variant class: PIK3CA aberration

Other identifiers: 2013-0525, CHRMS 14-081, EMR100018-001, TrialTroveID-196334

Population segments: Aggressive, Classical, EGFR, HER2 positive, Indolent, Nodular lymphocyte-predominant, Second line or greater/Refractory/Relapsed, Stage III, Stage IV

Phase: I

Therapy: MSC-2363318A

Country: United States

US States: CA, MI, TX, VT

US Contact: US Medical Information [888-275-7376]

Current Global Clinical Trials Information

Global Clinical Trials information is current as of 2016-03-01. For the most up-to-date information regarding a particular trial, search www.clinicaltrials.gov by NCT ID or search local clinical trials authority website by local identifier listed in 'Other identifiers'.

ERBB2 mutation

NCT02506556

A Phase II Exploratory, Open-label, Single Arm Study of BYL719 Monotherapy, a Selective Phosphatidylinositol 3-kinase (PI3K) Alpha Inhibitor, in Adult Patients With Advanced Breast Cancer Progressing After First Line Therapy.

Cancer type: Breast Cancer

Variant class: ERBB2 mutation

Other identifiers: LL14/02, PIKNIC, TrialTroveID-261995

Population segments: Second line or greater/Refractory/Relapsed, Stage III, Stage IV, Triple receptor negative

Exclusion criteria variant class: ERBB2 amplification

Phase: II

Therapy: alpelisib

Country: Australia

No NCT ID - see other identifier(s)

An open label, single arm, single agent, phase II trial of neratinib, an irreversible ERBB2 inhibitor, in metastatic ERBB2 mutant, HER2 negative breast cancer.

Cancer type: Breast Cancer

Variant class: ERBB2 mutation

Other identifiers: EORTC-1304-BCG - Anabela, EudraCT Number: 2013-004713-40, PUMA-NER-1202, TrialTroveID-214673

Population segments: HER2 negative, Line of therapy N/A, Stage IV

Phase: II

Therapy: neratinib

Country: Belgium

NCT01670877

A Phase II Study of Neratinib Alone and in Combination With Fulvestrant in Metastatic HER2 Non-amplified But HER2 Mutant Breast Cancer

Cancer type: Breast Cancer

Variant class: ERBB2 mutation

Other identifiers: 12-X244, 13-195, 201209135, DFCI: 13-237, TrialTroveID-173584, UAB1326, WASHU 201209135

Population segments: HER2 negative, Second line or greater/Refractory/Relapsed, Stage IV

Other inclusion criteria: ER negative

Phase: II

Therapies: neratinib, neratinib + fulvestrant, neratinib + trastuzumab, neratinib + trastuzumab + fulvestrant

Countries: Canada, United States

US States: AL, CA, IL, MA, MN, MO, NC, TX

US Contact: Multiple contacts: See www.clinicaltrials.gov for complete list of contacts.

ERBB2 mutation (continued)**NCT02544997**

A Phase II, Single-Arm Trial of Pozitotinib as Salvage Treatment in Patients With Metastatic Breast Cancer Who Has HER2 Mutation or Activated AR Pathway

Cancer type: Breast Cancer

Variant class: ERBB2 mutation

Other identifiers: 2014-11-078, TrialTroveID-264275

Population segments: HER2 positive, Second line or greater/Refractory/Relapsed, Stage IV

Phase: II

Therapy: pozitotinib

Country: Republic of Korea

NCT02152943

Combination Treatment With Everolimus, Letrozole and Trastuzumab in Hormone Receptor and HER2/Neu-positive Patients With Advanced Metastatic Breast Cancer and Other Solid Tumors: Evaluating Synergy and Overcoming Resistance

Cancer type: Breast Cancer

Variant class: ERBB2 mutation

Other identifiers: 2014-0119, NCI-2014-01615, TrialTroveID-210119

Population segments: First line, HER2 positive, Second line or greater/Refractory/Relapsed, Stage III, Stage IV

Other inclusion criteria: ER positive, PR positive/negative

Phase: I

Therapy: everolimus + trastuzumab + letrozole

Country: United States

US State: TX

US Contact: Dr. Jennifer J. Wheler [713-563-1930]

NCT02500199

A Two-part Phase I, Open Label, Dose Escalation Study to Evaluate the Safety, Tolerability and Pharmacokinetics of Pyrotinib in Patients With HER2 Positive Solid Tumors Who Failed Prior HER2 Targeted Therapy

Cancer type: Breast Cancer

Variant class: ERBB2 mutation

Other identifiers: SHRUS 1001, TrialTroveID-261429

Population segments: HER2 positive, Second line or greater/Refractory/Relapsed, Stage III, Stage IV

Phase: I

Therapy: pyrotinib

Country: United States

US State: TX

US Contact: Multiple contacts: See www.clinicaltrials.gov for complete list of contacts.

ERBB2 mutation (continued)**NCT02029001**

A Two-period, Multicenter, Randomized, Open-label, Phase II Study Evaluating the Clinical Benefit of a Maintenance Treatment Targeting Tumor Molecular Alterations in Patients With Progressive Locally-advanced or Metastatic Solid Tumors MOST: My own specific treatment

Cancer type: Unspecified Solid Tumor

Variant class: ERBB2 mutation

Other identifiers: ET12-081, EudraCT number: 2012-004510-34, MOST, ProfiLER, TrialTroveID-200294

Population segments: Maintenance/Consolidation, Second line or greater/Refractory/Relapsed, Stage III, Stage IV

Exclusion criteria variant class: BRAF V600 mutation

Phase: II

Therapies: everolimus, lapatinib, nilotinib, pazopanib, sorafenib

Country: France

No NCT ID - see other identifier(s)

Phase I Clinical Study With Advanced Solid Tumors KBP-5209 Treatment

Cancer type: Unspecified Solid Tumor

Variant class: ERBB2 mutation

Other identifiers: 5209-CPK-1002, CTR20150792, TrialTroveID-269399

Population segments: EGFR, Second line or greater/Refractory/Relapsed, Stage III, Stage IV

Phase: I

Therapy: pirotinib

Country: China

NCT01971515

A Phase I, First-in-Human, Dose Escalation Trial of MSC2363318A, a Dual p70S6K/Akt Inhibitor, in Subjects With Advanced Malignancies

Cancer type: Unspecified Solid Tumor

Variant class: ERBB2 aberration

Other identifiers: 2013-0525, CHRMS 14-081, EMR100018-001, TrialTroveID-196334

Population segments: Aggressive, Classical, EGFR, HER2 positive, Indolent, Nodular lymphocyte-predominant, Second line or greater/Refractory/Relapsed, Stage III, Stage IV

Phase: I

Therapy: MSC-2363318A

Country: United States

US States: CA, MI, TX, VT

US Contact: US Medical Information [888-275-7376]

Appendix: Evidence Summary by Variant Class

A variant class hierarchy was created to summarize gene variants with associated clinical evidence. Evidence items refers to citations across the different global data sources.

BRAF p.(V600E) c.1799T>A

| Variant Class | Evidence Items |
|----------------------------|----------------|
| RAF mutation | 0 |
| ↳ BRAF mutation | 14 |
| ↳ BRAF exon 15 mutation | 0 |
| ↳ BRAF V600 mutation | 32 |
| ↳ BRAF V600E mutation | 7 |
| ↳ BRAF activating mutation | 2 |
| ↳ BRAF V600 mutation | 32 |
| ↳ BRAF V600E mutation | 7 |

PIK3CA p.(G1049R) c.3145G>C

| Variant Class | Evidence Items |
|-------------------|----------------|
| PIK3CA aberration | 2 |
| ↳ PIK3CA mutation | 14 |

ERBB2 mutation

| Variant Class | Evidence Items |
|------------------|----------------|
| ERBB2 aberration | 1 |
| ↳ ERBB2 mutation | 10 |

Report Signed by

Report Checked by



Clinical Scientist

Pathologist

BMS (Senior)

BMS

BMS (Senior)

Terms and Conditions

The following paragraph on Liability is an extract from the Oncologica Tests' Terms and Conditions. The extract is to draw your attention to particular terms applicable to you but nothing set out here is intended to supersede or override our Terms and Conditions, which can be found on our website at www.oncologica.com under the title Oncologica Tests' Terms and Conditions. Please read these Oncologica Test Terms and Conditions carefully before you submit an order for the Oncologica Tests, as you will be bound by these Terms and Conditions, once a contract comes into existence as per paragraph 2 of the Oncologica Test's Terms and Conditions.

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6.1 Oncologica operates in compliance with international ISO15189:2012 standards and is regulated by UKAS. The Oncologica Tests have not been cleared or approved by the United States Food and Drug Administration; however, such clearance or approval is not required.

6.2 The Patient agrees that the Oncologica Test Report is intended for clinical use and interpretation by a physician who is experienced and skilled in the use and interpretation of clinical test data. The Oncologica Test Report is based on the Sample submitted by the Patient. The Oncologica Test Report should not be considered or its contents applied to any other patient or any other sample. Oncologica does not update an Oncologica Test Report once it has been sent.

6.3 Information compiled in the Oncologica Test Report includes is from publicly available as well as proprietary sources. By updating the source database, Oncologica makes every effort to provide the most accurate and up-to-date information. However, Oncologica does not warrant or represent that the information in the Oncologica Test Report is accurate, timely or complete.

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6.5 Subject to paragraph 6.10, Oncologica shall have no liability for any use made of the information provided in the Oncologica Test Report, including but not limited to any report prepared by Oncologica summarising the results of the Oncologica Tests, any advice supplied by Oncologica, any decisions taken, or for any costs incurred by Patient and/or the Patient's physician and/or the Agent in consequence of such use, advice or decisions. The Oncologica Test and/or the Oncologica Test Report is not a substitute for the Patient's physician's professional judgment. The use of the information provided in the Oncologica Test Report is provided as a tool for the ordering physician's use in determining the appropriate treatment for the Patient. The decision as to what course of treatment and the appropriate use of the information provided by the Oncologica Test Report is solely that of the Patient's physician.

6.6 Oncologica does not warrant or represent or guarantee that the Oncologica Tests will identify an actionable genetic alteration that is linked to anti-cancer targeted therapies. Although the Oncologica Tests are comprehensive, in a proportion of Patients, the Oncologica Test result may not identify any actionable mutations for a patient's cancer. In the event that no actionable alteration in the Sample is identified by the Oncologica Test, then the Patient is still under full obligation to pay the Charges and no refund is available to the Patient and/or Agent.

6.7 The Oncologica Test identifies genomic actionable alterations found in the submitted Sample that are linked to anti-cancer targeted agents. Also note that this test only examines tumour, and not normal tissue from the patient, and therefore cannot distinguish between somatic and germline (i.e., heritable) alterations.

6.8 Subject to Clause 6.8, Oncologica shall not be liable to the Patient whether in contract, tort (including negligence and breach of statutory duty), or otherwise for any:

- (a) Error or defect in the Oncologica Test Report as a result of any inaccurate or incomplete information supplied by the Patient;
- (b) Loss of data or materials, including the Sample and/or the Report and including any loss arising as a result of the acts or omissions of a courier;
- (c) Indirect or consequential loss arising whether or not advised of the possibility of the same.

6.9 Subject to the provisions of this Clause 6, Oncologica's total liability to the Patient in respect of all losses arising under or in connection with the Contract, whether in contract, tort (including negligence and breach of statutory duty), or otherwise, shall in no circumstances exceed the Charges paid for the Test that is the subject of the claim.

6.10 Nothing in the Contract limits or excludes the liability of Oncologica for breach of its obligations under section 12 of the Sale of Goods Act 1979 and/or section 2 of the Supply of Goods and Services Act 1982; death or personal injury resulting from negligence; or fraud or fraudulent misrepresentation.

6.11 If the Patient is a consumer (and not a business), the Patient expressly acknowledges and agrees that the Test is supplied to the Patient's specification and therefore there is no right to cancel the Test following acceptance under Clause 2.2. If the Patient is a consumer, then notwithstanding any other provisions of the Contract, none of the Patient's consumer statutory rights are affected.

