

# BRAF-mutant Non-Small Cell Lung Cancer (BRAF + NSCLC) – Pipeline Insight, 2020

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# **Abstracts**

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DelveInsight's, "BRAF-mutant Non-Small Cell Lung Cancer (BRAF + NSCLC) — Pipeline Insight, 2020," report provides comprehensive insights about 15+ companies and 15+ pipeline drugs in BRAF-mutant Non-Small Cell Lung Cancer pipeline landscape. It covers the pipeline drug profiles, including clinical and nonclinical stage products. It also covers the therapeutics assessment by product type, stage, route of administration, and molecule type. It further highlights the inactive pipeline products in this space.

Geography Covered

Global coverage

Non-Small Cell Lung Cancer Understanding

Non-Small Cell Lung Cancer (NSCLC): Overview

Lung cancer is a type of cancer that starts in the lungs. Cancer starts when cells in the body begin to grow out of control. About 80% to 85% of lung cancers are Non-Small Cell Lung Cancer. The main subtypes of Non-Small Cell Lung Cancer are adenocarcinoma, squamous cell carcinoma, and large cell carcinoma. These subtypes, which start from different types of lung cells are grouped together as Non-Small Cell Lung Cancer because their treatment and prognoses (outlook) are often similar.



The three main histological subtypes of Non-Small Cell Lung Cancer are:

Adenocarcinoma: About 40% of all lung cancers are adenocarcinomas. These tumors start in mucus-producing cells that line the airways.

Squamous cell carcinoma (SCC): About 25-30% of all lung cancers are Squamous cell carcinoma. This type of cancer develops in cells that line the airways and is usually caused by smoking.

Large cell (undifferentiated) carcinoma: This type makes up around 10-15% of all lung cancers. It gets its name from the way that the cancer cells look when they are examined under a microscope.

BRAF mutated lung cancer is a rare form of NSCLC. Many different types of BRAF mutations have been described.

#### **BRAF** mutations

BRAF mutations are seen in up to 3.5–4% of the non-small cell lung cancer (NSCLC) patients. BRAF V600E mutations account for 50% of these cases, and the remaining BRAF mutations are non-V600E. The biologic behavior of BRAF-mutated lung tumors tends to be more aggressive and resistant to chemotherapy, but responses to tyrosine kinase inhibitors such as BRAF inhibitors with or without MEK inhibitors have provided another effective tool to attain better response rates when compared to cytotoxic chemotherapy. New strategies such as immunotherapy are becoming as well another option to treat in the second-line setting patients with BRAF-mutated NSCLC.

## Molecular pathways

BRAF gene encodes a serine/threonine-protein kinase that regulates normal cell growth and proliferation. The amino acid residues that specifically encode the kinase domain of BRAF are 457–717. The activation loop of the kinase is located within the residues 596–600, which interact with the phosphate-binding loop keeping the kinase locked. Once the activation loop is phosphorylated, BRAF can also phosphorylate and thus activate the mitogen-activated 2 kinase 1 and 2 (MAP2K 1/2) signaling pathway (also known as MEK1/2), which will phosphorylate the tyrosine and threonine residues of the MAPK ERK1/2 proteins. ERK1/2 will activate by phosphorylation proteins of the MAPKAPKK family and cytoskeletal proteins such as vimentin and keratin-8. ERK 1 and



2 will also translocate to the nucleus activating transcription factors such as FOS, TP53, and ELK1.

Immunotherapy in patients with BRAF mutations

Targeting BRAF V600E mutations with a combination of BRAF and MEK inhibitors appear to be the best frontline option for patients with this oncogenic driver. There are insufficient data to determine the responses for patients with BRAF non-V600E mutations. According to phase II trials, the responses to combined BRAF/MEK inhibitors in the first-line setting is higher than if given in the second line or beyond. BRAF V600E appears to confer aggressive biology, and cytotoxic chemotherapy is inferior when used in the first-line setting. The second-line treatment is unclear at this moment. Immune checkpoint inhibitors appear to have some activity in retrospective analyses, but further prospective trials are needed to establish their efficacy in this subset of patients.

BRAF-mutant Non-Small Cell Lung Cancer Emerging Drugs Chapters

This segment of the BRAF-mutant Non-Small Cell Lung Cancer report encloses its detailed analysis of various drugs in different stages of clinical development, including phase II, I, preclinical and Discovery. It also helps to understand clinical trial details, expressive pharmacological action, agreements and collaborations, and the latest news and press releases.

BRAF-mutant Non-Small Cell Lung Cancer Emerging Drugs

Vemurafenib: Roche

Vemurafenib is an orally bioavailable, ATP-competitive, small-molecule inhibitor of BRAF (V600E) kinase with potential antineoplastic activity. Vemurafenib selectively binds to the ATP-binding site of BRAF(V600E) kinase and inhibits its activity, which may result in an inhibition of an over-activated MAPK signaling pathway downstream in BRAF(V600E) kinase-expressing tumor cells and a reduction in tumor cell proliferation. Roche is conducting a phase 2/3, global, multicenter, open-label, multi-cohort study designed to evaluate the safety and efficacy of targeted therapies or immunotherapy as single agents or in combination in participants with unresectable, advanced or metastatic NSCLC determined to harbor oncogenic somatic mutations or positive by tumor mutational burden (TMB) assay as identified by two blood-based next-generation sequencing (NGS) circulating tumor DNA (ctDNA) assays.



Further product details are provided in the report......

BRAF-mutant Non-Small Cell Lung Cancer: Therapeutic Assessment

This segment of the report provides insights about the different BRAF-mutant Non-Small Cell Lung Cancer drugs segregated based on following parameters that define the scope of the report, such as:

Major Players in BRAF-mutant Non-Small Cell Lung Cancer

There are approx. 15+ key companies which are developing the therapies for BRAF-mutant Non-Small Cell Lung Cancer. The companies which have their BRAF-mutant Non-Small Cell Lung Cancer drug candidates in the advanced stage, i.e. phase III and Phase II include, Hoffmann-La Roche, Array BioPharma/Ono Pharmaceutical, Merck, AstraZeneca etc.

#### Phases

DelveInsight's report covers around 15+ products under different phases of clinical development like

Mid-stage products (Phase II and Phase I/II)

Early-stage products (Phase I/II and Phase I) along with the details of

Pre-clinical and Discovery stage candidates

Discontinued & Inactive candidates

Route of Administration

BRAF-mutant Non-Small Cell Lung Cancer pipeline report provides the therapeutic assessment of the pipeline drugs by the Route of Administration. Products have been categorized under various ROAs such as

Intramuscular



Oral

Oral
Intratumoral
Intravenous
Molecule Type
Products have been categorized under various Molecule types such as
Gene therapies
Bispecific antibodies
Immunotherapies
Monoclonal antibodies
Small molecules
Product Type
Drugs have been categorized under various product types like Mono, Combination and Mono/Combination.
BRAF-mutant Non-Small Cell Lung Cancer: Pipeline Development Activities

The report provides insights into different therapeutic candidates in phase II, I, preclinical and discovery stage. It also analyses BRAF-mutant Non-Small Cell Lung Cancer therapeutic drugs key players involved in developing key drugs.

Pipeline Development Activities

The report covers the detailed information of collaborations, acquisition and merger, licensing along with a thorough therapeutic assessment of emerging BRAF-mutant Non-Small Cell Lung Cancer drugs.



# Report Highlights

The companies and academics are working to assess challenges and seek opportunities that could influence BRAF-mutant Non-Small Cell Lung Cancer R&D. The therapies under development are focused on novel approaches to treat/improve BRAF-mutant Non-Small Cell Lung Cancer.

BRAF-mutant Non-Small Cell Lung Cancer Report Insights

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Therapeutic Assessment

**Unmet Needs** 

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Pipeline Product Profiles

Therapeutic Assessment

Pipeline Assessment

Inactive drugs assessment

**Unmet Needs** 

**Key Questions** 

Current Treatment Scenario and Emerging Therapies:

How many companies are developing BRAF-mutant Non-Small Cell Lung Cancer drugs?



How many BRAF-mutant Non-Small Cell Lung Cancer drugs are developed by each company?

How many emerging drugs are in mid-stage, and late-stage of development for the treatment of BRAF-mutant Non-Small Cell Lung Cancer?

What are the key collaborations (Industry–Industry, Industry–Academia), Mergers and acquisitions, licensing activities related to the BRAF-mutant Non-Small Cell Lung Cancer therapeutics?

What are the recent trends, drug types and novel technologies developed to overcome the limitation of existing therapies?

What are the clinical studies going on for BRAF-mutant Non-Small Cell Lung Cancer and their status?

What are the key designations that have been granted to the emerging drugs?

## **Key Players**

Roche

Array BioPharma/Ono Pharmaceutical

Jazz Pharmaceuticals/Redx Pharma

Merck

AstraZeneca

Novartis Oncology

# **Key Products**

Vemurafenib



Research programme: pan-RAF inhibitors

MK 2206



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Research and Development

**Product Development Activities** 

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**Product Description** 

Research and Development

**Product Development Activities** 

MK 2206: Merck

**Product Description** 

Research and Development



**Product Development Activities** 

Drug profiles in the detailed report.....

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**Comparative Analysis** 

Research programme: pan-RAF inhibitors: Jazz Pharmaceuticals/Redx Pharma

**Product Description** 

Research and Development

Product Development Activities

Drug profiles in the detailed report.....

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