

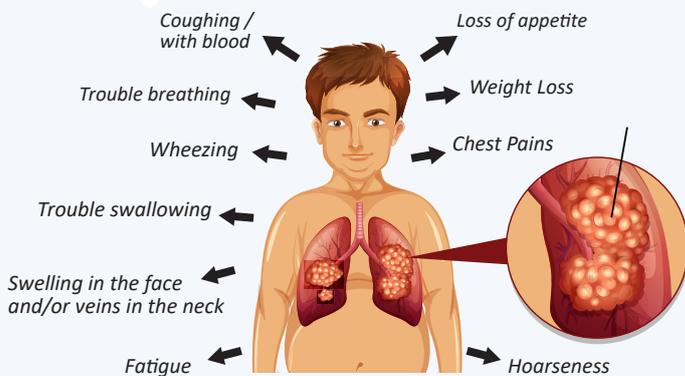
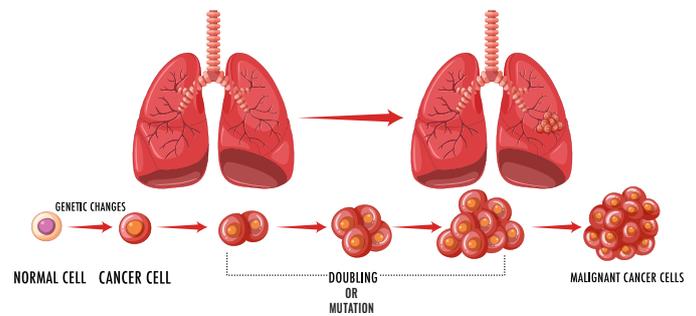
# LUNG CANCER

DIAGNOSIS

Efficient Diagnosis By NGS

Lung cancer, or lung carcinoma, is a malignant lung tumor characterized by uncontrolled cell growth in lung tissues. Most cancers that start in the lung, known as primary lung cancers, are carcinomas. The two main types are small-cell lung carcinoma (SCLC) and non-small-cell lung carcinoma (NSCLC).

## HOW CANCER DEVELOPS



**Symptoms of Lung Cancer**

*Lung Cancer, warning signs may not occur, or may not be obvious in the early stages of the disease. Consequently, most patients are diagnosed in the latter stages of the disease thus reducing the chance of survival.*

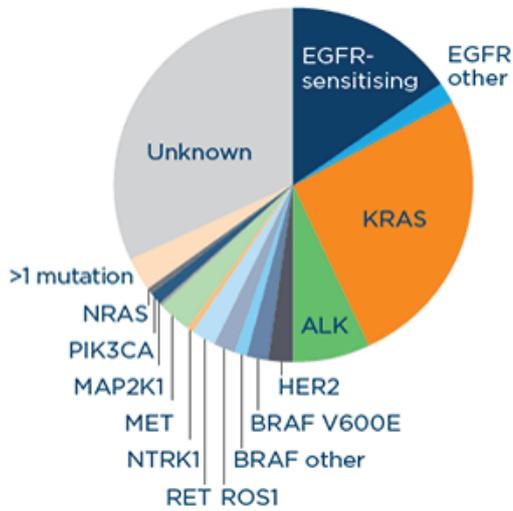
**NGS HELP DETECT CANCER IN EARLY STAGE**

## Mutations in Lung Cancer

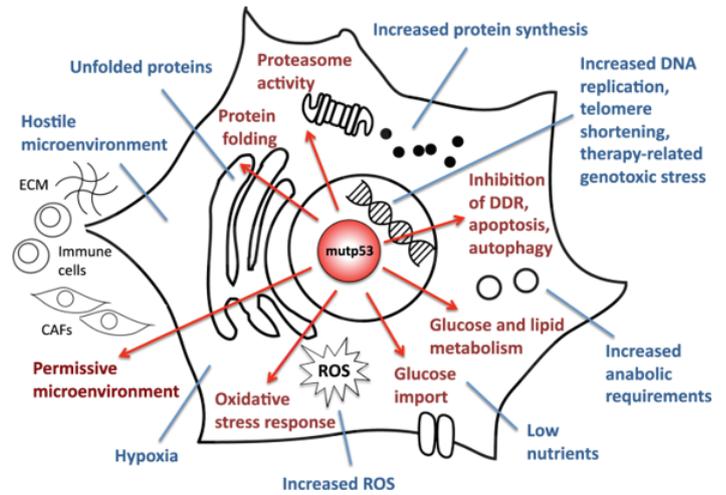
Somatic mutations in multiple genes have been found in lung cancer cells. Somatic mutations in the TP53, EGFR, and KRAS genes are common in lung cancers. The TP53 gene regulates the synthesis of protein p53, located in the nucleus of cells, where it binds directly to DNA. This protein regulates cell growth and division by monitoring DNA damage.

TP53 gene mutations result in the production of an altered p53 protein that cannot bind to DNA. The altered protein cannot regulate cell proliferation effectively resulting in accumulation of DNA damage in cells. Such cells continue to divide in an uncontrolled way, leading to tumor growth.

Mutations in the **EGFR or KRAS gene** lead to the production of a protein that is constantly turned on (constitutively activated), As a result, cells constantly receive signals to proliferate, leading to tumor formation. When these genetic changes occur in cells in the lungs, lung cancer develops.



**Driver Mutations in Lung Adenocarcinoma**



**Fig.: Mutant p53 as a guardian of the cancer cell | Cell Death & Differentiation.**

(Mantovani, F., Collavin, L. & Del Sal, G. Mutant p53 as a guardian of the cancer cell. Cell Death Differ 26, 199–212 (2019).

## NGS Identifies Mutations in Lung Cancer

- NGS identifies novel and rare cancer mutations, detect familial cancer mutation carriers, and provide molecular rationale for appropriate targeted therapy.
- NGS detects alteration in key genes involved in the development of lung cancer. These genes are EGFR, BRAF, KRAS, HER2, ROS, ALK, PIK3CA, NTRK, RET and MET.
- NGS enables sequencing of multiple genes simultaneously to detect any mutation such as SNV, CNV, SNP, Insertion and deletion etc. quite fast thus providing efficient treatment strategy.

