The Importance of Testing for EGFR Mutations at Initial Diagnosis in Metastatic NSCLC

Lung cancer and the role of epidermal growth factor receptor (EGFR)

Today, lung cancer is a leading cause of cancer deaths in the United States

An estimated 222,500 new cases of lung cancer were diagnosed in the US in 2017.[1] The 2 main types of lung cancer are:

- Non–small cell lung cancer (NSCLC), occurring in 85% of patients[1]
- Small cell lung cancer (SCLC), occurring in 15% of patients[1]

This website focuses on NSCLC, since it is the most common form of lung cancer.

~70% NSCLC patients that will be diagnosed with metastatic lung cancer[2]

~1%-10% 5-year survival rate for metastatic or stage IV NSCLC[1]

Each year, more people die of lung cancer than colon, breast, and prostate cancer combined.[1]

Approximately **1 in 4** cancer deaths are from lung cancer[1]

Predictive biomarkers in NSCLC: An exciting discovery

The NSCLC treatment landscape is changing, and physicians are using biomarkers to help tailor and personalize therapy for their patients. Cancer biomarkers are substances in the body that can be identified or measured, and may be used to guide treatment decisions as well as predict how well a patient will respond to treatment.[3] Some of the most common biomarkers in NSCLC are genetic changes, and include[4,5]:

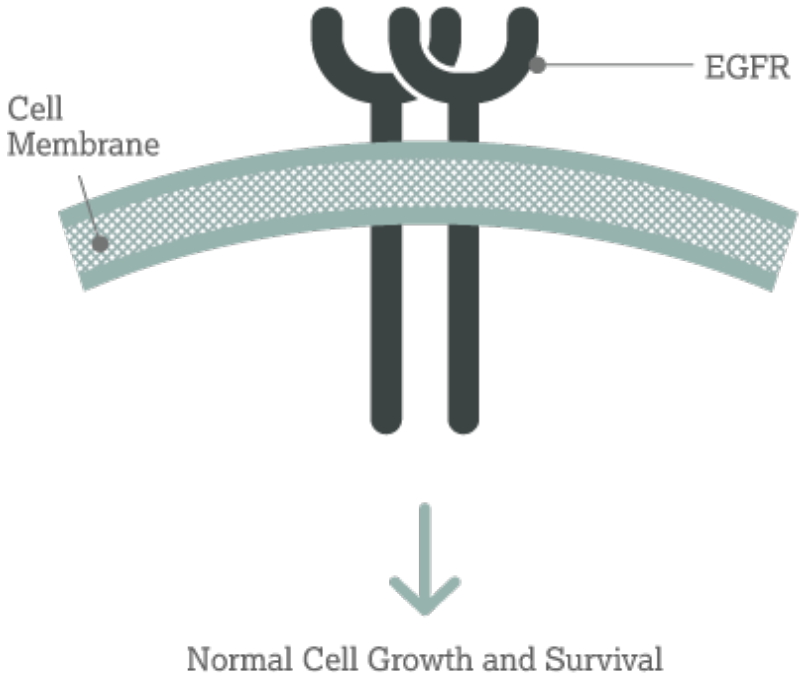
NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines®) recommend testing for all actionable biomarkers at diagnosis of NSCLC, including EGFR, BRAF, ROS1 mutations, ALK rearrangements, and PD-L1 expression.[5]

Testing for EGFR mutations, which are present in a significant number of patients with NSCLC, is the focus of this website.

EGFR is an important biomarker in NSCLC and can help guide treatment decisions at the time of initial diagnosis[1]

EGFR can be found on the surface of both healthy cells and lung cancer cells.[6]

EGFR Function in Healthy Cells[6]



In healthy cells, EGFR activity leads to normal cell growth and survival.

In some patients with metastatic NSCLC, mutations or changes in the DNA code of EGFR may help cancer cells grow.[6]

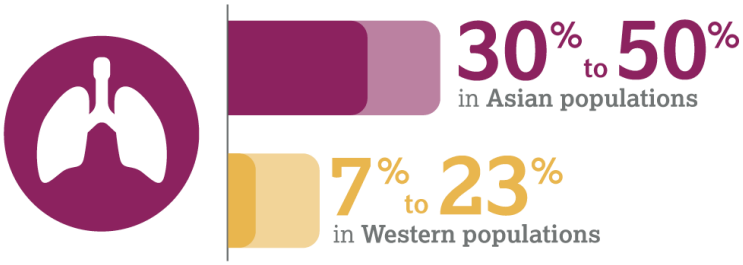
- Mutated EGFR can be used as a biomarker to help identify those patients with newly diagnosed metastatic NSCLC who may be eligible to receive EGFR tyrosine kinase inhibitor (EGFR-TKI) therapy[5]

ALK, anaplastic lymphoma kinase; BRAF, v-Raf murine sarcoma viral oncogene homolog B; PD-L1, programmed death-ligand 1; ROS1, ROS proto-oncogene 1, receptor tyrosine kinase.

EGFR sensitizing mutations

Some types of EGFR mutations that help cancer cells grow and survive are considered sensitizing mutations.[6,7]

The incidence of EGFR sensitizing mutations in patients with metastatic NSCLC is significant and varies by ethnicity[8-13]

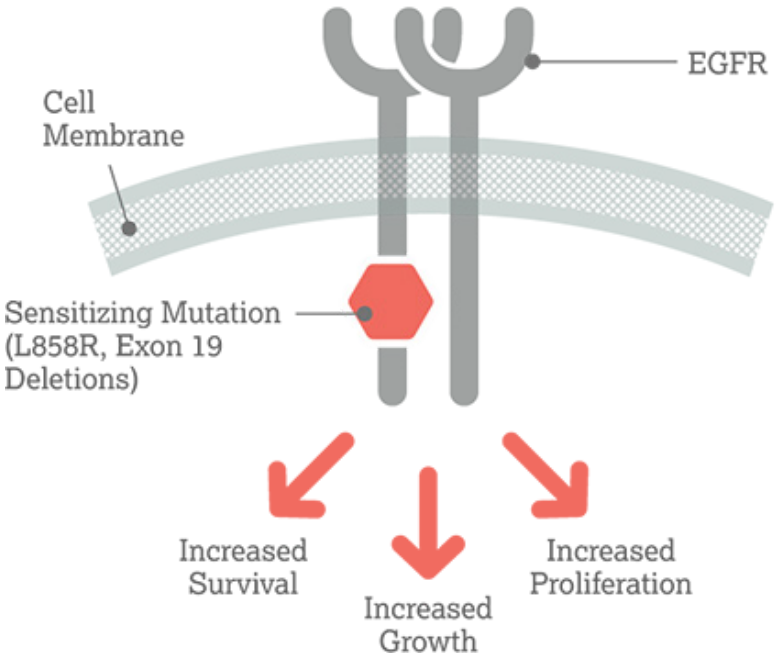


The most common EGFR sensitizing mutations are exon 19 deletions (in which a portion of the gene is missing) and the L858R point mutation (in which a specific part of the gene is changed).[14]

Exon 19 Deletions

L858R Point Mutation

Mutant EGFR in Cancer Cells[6]



In some cases of NSCLC, EGFR sensitizing mutations lead to the increased survival, growth, and proliferation of cancer cells.

Recommendations for EGFR mutation testing at diagnosis

Identifying EGFR mutations at diagnosis has implications for making treatment decisions. Testing for biomarkers, including EGFR mutations, is recommended by a number of national clinical organizations, including:

- National Comprehensive Cancer Network® (NCCN®)[5]
- College of American Pathologists (CAP)[15]
- International Association for the Study of Lung Cancer (IASLC)[15]
- Association for Molecular Pathology (AMP)[15]

It is important to obtain results for all actionable biomarkers, including EGFR, before making treatment decisions.

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