EGFR Mutation Analysis – Plasma Testing

NON-SMALL CELL LUNG CANCER

Features

- The first plasma-based FDA-approved companion diagnostic test to determine patients' eligibility to receive:
  - Tarceva® (erlotinib).¹
  - TAGRISSO™ (osimertinib) in patients positive for T790M mutations.²
- Plasma-based testing provides a less invasive testing option when traditional tumor biopsy testing is not an option.
- Identifies 42 mutations in exons 18, 19, 20, and 21 of the EGFR gene.³
- Shortened turn-around time for plasma compared to traditional tumor DNA testing.
- EGFR mutation testing is typically covered by Medicare and many private payers.

Accessibility to Testing

- For patients with poor performance status for whom obtaining a tissue biopsy would not be appropriate.
- For patients in which obtaining a tissue biopsy is not feasible due to inaccessibility to tumor.
- For patients in which the tumor biopsy was inadequate or insufficient tumor content.
- To obtain results to start patients on treatment prior to or in lieu of tumor testing results.

Assess for Acquired Resistance Mutation

- In recent studies, virtually all NSCLC patients treated with first-line tyrosine kinase inhibitors (TKIs) eventually develop resistance to these therapies. Of these patients, 60-68% develop the resistance T790M mutation.⁴,⁵
- cobas® V2 EGFR assay is FDA-approved to identify patients with the acquired EGFR resistance mutation, T790M, for considering TAGRISSO™ therapy.¹²
- Patients with T790M-acquired resistance mutations treated with TAGRISSO™ were shown to have an objective response rate of about 59%.¹

Correlation with EGFR Tumor Testing

- A recent study evaluated the detection of EGFR-activating and T790M mutations in matched tissue and plasma samples from NSCLC patients using the cobas® V2 EGFR assay. The findings include:⁵
  - Correlation between plasma and tumor results:

<table>
<thead>
<tr>
<th>Percent Agreement</th>
<th>Activating Mutations (exons 18-21)</th>
<th>T790M Resistance Mutation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>73%</td>
<td>64%</td>
</tr>
<tr>
<td>Negative</td>
<td>100%</td>
<td>98%</td>
</tr>
<tr>
<td>Overall</td>
<td>80%</td>
<td>86%</td>
</tr>
</tbody>
</table>

- The same activating mutations were identified in tumor and plasma samples (100% concordance).
- In 16 patients with inadequate tissue to perform tumor testing, 13 (81%) had mutations identified in the plasma sample.
Specimen Requirements

Collection Instructions
It is recommended that patients be referred to a LabCorp Patient Service Center for collection. Otherwise, take care to follow the procedure of specimen collection and preparation outlined below.

Blood Collection
- Collect three, BD K$_2$EDTA 4 mL blood collection tubes. Blood should be collected according to your laboratory’s procedure for venipuncture using ONLY BD K$_2$EDTA 4 mL blood collection tubes.
- Plasma preparation should be performed within 4 hours after blood is collected.
- Store and ship plasma at frozen conditions only. The plasma sample can be stored frozen, at <-70°C for up to 12 months.

Note: Do not freeze whole blood samples.

Plasma Specimen Preparation
- Immediately following specimen collection, label all tubes with appropriate patient identification information (two patient identifiers, minimum, and label “plasma” on transport tube).
- Centrifuge the three, BD K$_2$EDTA blood collection tubes for 10 minutes at 1600±90 rcf.
- Remove blood collection tubes from the centrifuge. Plasma sample will be rejected if it is hemolyzed.
- Using a fresh 6-inch disposable transfer pipette, transfer plasma from three, 4 mL blood collection tubes to one 8.5 mL Sarstedt centrifuge tube (55.598.006). One, 8.5 mL tube will be collected from three, 4 mL blood collection tubes.
- Centrifuge plasma in the 8.5 mL centrifuge tube for 10 minutes at 1600±90 rcf.
- Using a fresh, 6-inch disposable transfer pipette or serological pipette, transfer 4 mL of plasma from one 8.5 mL centrifuge tube into a labeled 7.0 mL Sarstedt screw-cap, flat bottom, purple frozen transport tube (62.550.019). One, 7.0 mL tube will be collected.
- Store and ship frozen plasma at <-70°C. Stable for up to 12 months.

Note: Take care not to disturb or transfer the buffy coat (white blood cells) layered above the red blood cells in the blood collection tube after the first centrifugation, or sedimented at the bottom of the centrifuge tube after the second centrifugation.

Test Number: 489067

REFERENCES