

# The Need for Rapid Lung NGS

Speeding up lung cancer NGS so oncologists and NSCLC patients don't have to wait

An interview with Lauren Ritterhouse

How has non-small cell lung cancer biomarker testing evolved in your lab?

Although our laboratory has performed panel-based next-generation sequencing (NGS) testing for quite some time now, we have also run single-gene assays in parallel to provide a faster turnaround time for key actionable alterations in non-small cell lung cancer (NSCLC). Recently, we have been trying to streamline many of our rapid single-gene assays onto a single NGS-based assay that covers the same alterations simultaneously with a quick turnaround time as part of our rapid-lung NGS program.

What's your current lab workflow for NSCLC biomarker testing?

We now use a single fast NGS assay, in some cases from FFPE tissue biopsy, and have also recently piloted an ultra-rapid molecular testing program for certain patients with advanced NSCLC. This is a multidisciplinary program involving oncology, pathology, cytology, interventional radiology, and specialty pharmacy. Ultra-rapid molecular tests are performed using frozen section specimens taken from the diagnostic biopsy – and we often have the genotype report signed out before the diagnostic biopsy result is finalized.

Key components of this program are communication between care teams and early initiation of prior authorization test claims via specialty pharmacy. This integrated diagnostic service improves not

only the assay turnaround time, but also the time it takes for a patient to begin receiving the appropriate therapy.

How has in-house NGS improved turnaround times and sample reporting success rates?

By having our molecular testing in-house, we can streamline and optimize workflows all the way from test order, prior authorization, biopsy coordination, and specimen retrieval through to test performance and reporting.

With adequate tumor purity (>10 percent), we have very high technical completion rates (well above 95 percent); our turnaround time is 10 days for our routine NGS assays and less than five days for our rapid-lung NGS program.

How does amplicon-based NGS allow you to successfully test small NSCLC samples? We have a variety of assays on our molecular test menu. With small specimens or those with little tissue remaining, we have very good success using our smaller, hotspot-focused amplicon-based NGS panels. These assays are quite forgiving on specimens with low nucleic acid input, such as those from NSCLC biopsies, as illustrated by the high technical completion rates we achieve.

Why is turnaround time such a critical factor in NSCLC patient management?

The growing list of FDA-approved targeted first-line therapies for NSCLC necessitates that timely genomic profiling results be returned to patients with advanced disease so that they can receive the appropriate therapy as quickly as possible. A recent retrospective study of stage IV NSCLC patients demonstrated that those with actionable oncogenic driver mutations who are placed on TKI therapy as first-line treatment have better clinical outcomes than those treated with immunotherapies, chemotherapies, or combinations (1).

Has rapid NGS allowed you to provide a more complete biomarker profile – including IHC – in a complementary manner to inform clinical decision-making? Although we do not currently include our genomic profiling results with our surgical pathology reports or with IHC markers such as PD-L1, the availability of those results in a timely manner is important for our oncology colleagues – especially when it takes only a few days for them to receive PD-L1 IHC results. It can be quite challenging when they have the PD-L1 biomarker results, but need to wait several more weeks to receive the additional recommended test results.

Why is this important for the treating oncologists – and what feedback have you received from them?

This is particularly important for patients who are acutely ill and cannot wait weeks before starting therapy. If genomic profiling results are not received quickly, oncologists are forced to make decisions based on an incomplete dataset so that they can provide immediate therapy to patients who need it. With our rapid-lung NGS program, we strive to provide our oncology colleagues with all of the clinically recommended biomarkers in the first-line setting so that they can make these decisions with full information and confidence.

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## Reference

1. RE Smith et al., "Evaluation of outcomes in patients (pts) with stage 4 non-small cell lung cancer (NSCLC 4) harboring actionable oncogenic drivers (AOD) when treated prior to report of mutation without tyrosine kinase inhibitors (TKI): An Integra Connect Database (ICD) retrospective observational study," *J Clin Oncol*, 40, 1530 (2022).

