

# Liquid Biopsy—Circulating Tumor DNA

## Conducting Biomarker Tests on Blood Samples

Liquid biopsy is an alternative method for collecting circulating tumor DNA (ctDNA) to perform next-generation sequencing (NGS) genomic biomarker testing and identify appropriate, targeted treatment options.<sup>1-3</sup>



### Why and when to use a liquid biopsy

- May be used when a more rapid diagnosis is preferred or when conducting a traditional tumor biopsy is prohibitive<sup>3,4</sup>
- May be used for tumor genomic profiling to monitor patients for disease progression and response to treatment<sup>5,6</sup>

### How to test a blood sample for ctDNA

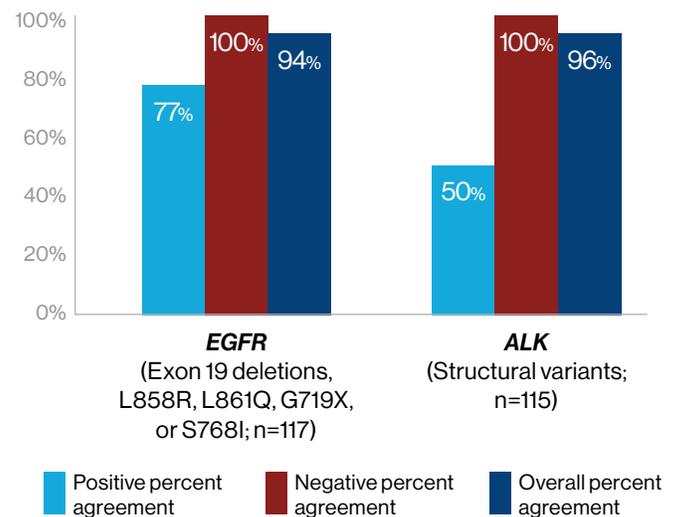
- Guardant Health and Foundation Medicine have FDA-approved liquid biopsy companion diagnostics<sup>7</sup>
- Local laboratories may also offer their own liquid biopsy NGS genomic biomarker testing

## Validation and Concordance of *EGFR* and *ALK* Variants in NSCLC Patients Using a 17-Gene Liquid Biopsy Assay<sup>8</sup>

A prospective, clinical concordance study assessed *EGFR* variant concordance between liquid and tissue biopsy in patients with nonsquamous non-small cell lung cancer (NSCLC).

### The data demonstrated:

- Sensitivities for *EGFR* and *ALK* alterations assessed in liquid biopsy vs tumor tissue were 77% and 50%, respectively, in patients with metastatic disease
- An initial liquid biopsy assessment may be clinically helpful when obtaining a tissue biopsy is challenging

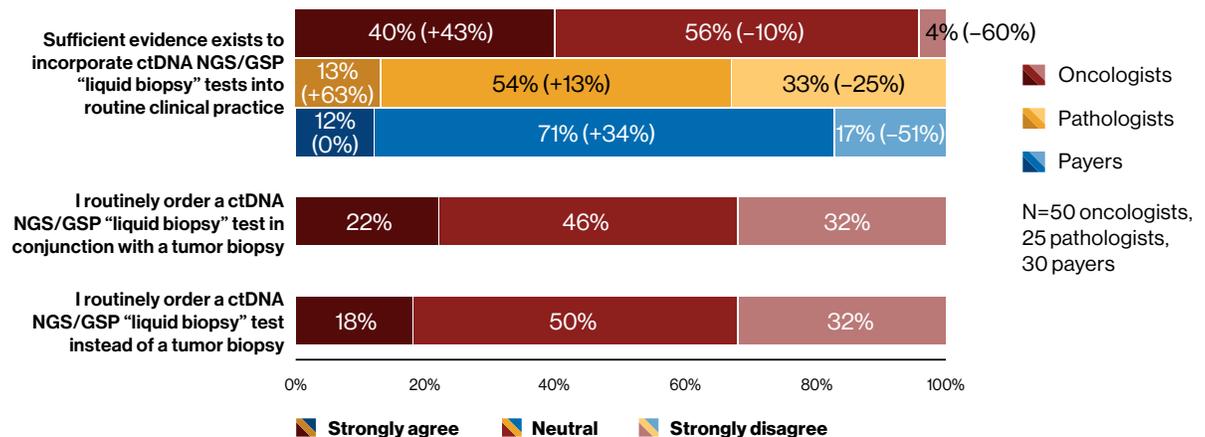


ALK, anaplastic lymphoma kinase; DNA, deoxyribonucleic acid; EGFR, epidermal growth factor receptor; FDA, US Food and Drug Administration.

## Liquid Biopsy Tests—NGS Utilization for Screening and Disease Monitoring<sup>9</sup>

Results of *The Precision Oncology Annual Trend Report*, Seventh Edition, sponsored by Novartis Oncology, reveal that stakeholders have not decided if there is enough clinical evidence to incorporate liquid biopsy tests into routine clinical practice (56% of oncologists, 54% of pathologists, and 71% of payers are neutral).<sup>9\*</sup>

### Stakeholder Opinions on the Utilization of ctDNA NGS/GSP Liquid Biopsy Tests<sup>9\*</sup>



Values in parentheses indicate percent change from 2019.   
 GSP, genomic sequencing panel.

Despite the adoption by oncologists in clinical practice, controversy surrounding the use of liquid biopsy tests for screening and disease monitoring continues.

### Liquid Biopsy Tests: Stakeholder Pros and Cons<sup>9\*</sup>

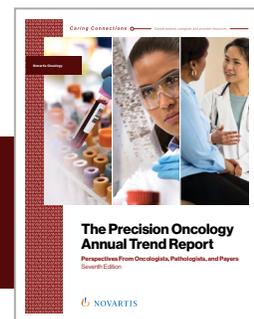
#### Pros

- Noninvasive
- Solution for lack of tissue
- At disease progression, helps avoid a second invasive biopsy
- Appropriate for patients when a surgical intervention is not considered
- Diagnosis has been determined and *EGFR* status needs to be verified
- Ease of use (eg, during COVID-19 when tumor biopsies were not being done in some centers and/or patients did not want to come in for procedures)

#### Cons

- Limited clinical data supporting specificity and sensitivity
- High false negative rate
- Limited clinical data supporting clinical use
- Doesn't yield the same robust information that a tumor biopsy does (eg, ancillary node involvement)

For a copy of *The Precision Oncology Annual Trend Report*, **contact your Novartis representative** or visit [hcp.novartis.com/care-management](http://hcp.novartis.com/care-management).



\*These data are based on the 2020 Precision Oncology Annual Trend Report survey of 50 oncologists, 30 pathologists, and 60 payers that occurred between July and August 2020.

**References:** 1. Heitzer E, Ulz P, Geigl JB. Circulating tumor DNA as a liquid biopsy for cancer. *Clin Chem*. 2015;61(1):112-123. 2. Fernández-Lázaro D, García-Hernández JL, García AC, et al. Liquid biopsy as novel tool in precision medicine: origins, properties, identification and clinical perspective of cancer's biomarkers. *Diagnostics*. 2020;10(4):215. 3. Merker JD, Oxnard GR, Compton C, et al. Circulating tumor DNA analysis in patients with cancer. *J Clin Oncol*. 2018;36(16):1631-1641. 4. Wu J, Hu S, Zhang L, et al. Tumor circulome in the liquid biopsies for cancer diagnosis and prognosis. *Theranostics*. 2020;10(10):4544-4556. 5. Dawson SJ, Tsui DW, Murtaza M, et al. Analysis of circulating tumor DNA to monitor metastatic breast cancer. *N Engl J Med*. 2013;368(13):1199-1209. 6. Kruglyak KM, Lin E, Ong FS. Next-generation sequencing in precision oncology: challenges and opportunities. *Expert Rev Mol Diagn*. 2014;14(6):635-637. 7. National Cancer Institute. FDA approves blood tests that can help guide cancer treatment. <https://www.cancer.gov/news-events/cancer-currents-blog/2020/fda-guardant-360-foundation-one-cancer-liquid-biopsy>. Accessed February 23, 2021. 8. Schwartzberg LS, Horinouchi H, Chan D, et al. Liquid biopsy mutation panel for non-small cell lung cancer: analytical validation and clinical concordance. *NPJ Precis Oncol*. 2020;4:15. 9. Novartis Oncology. *The Precision Oncology Annual Trend Report: Perspectives From Oncologists, Pathologists, and Payers*. 7th ed, 2021.

