Comprehensive Biomarker Test Selection in Early-Stage NSCLC

Comprehensive biomarker testing can improve patient access to personalized medicine by identifying actionable biomarkers for targeted therapy and emerging biomarkers for clinical trial opportunities.[1-5]

Comprehensive biomarker testing is inclusive of IHC to evaluate PD-L1 levels and **genomic testing** to identify driver alterations.[1-5]

Recommended Options for Genomic Testing

Upfront Comprehensive Genomic Profiling (CGP)[1,4]

Broad, NGS-based genomic testing can capture all actionable and emerging biomarkers in one test, enabling efficient use of tissue samples.

Enrollment for an increasing number of (neo)adjuvant clinical trials may benefit from upfront CGP.[2,4]

SGT* or Small Panel Testing** ▶ Comprehensive Genomic Profiling[1,4]

SGT or small panel testing can quickly provide results for some common biomarkers. These tests are not comprehensive and risk tissue exhaustion and extended TAT with the addition of CGP.

Liquid Biopsy-Based Genotyping[4,6-9]

For stages I-IIIA NSCLC, tissue-based testing is preferred because these tumors do not reliably shed ctDNA; therefore, liquid biopsy can often miss actionable mutations and is not a recommended option in early-stage NSCLC.

Key Considerations

*SGT has limitations when not paired with broad, NGS-based genomic testing[1,4]:

- SGT alone is reliant on assays and methods with generally lower specificity and sensitivity relative to NGS
- SGT is highly sensitive for specific known mutations but may not be able to detect rare or complex variants
- While the upfront cost is lower for SGT compared to NGS, it can become expensive if multiple genes are tested individually and can increase TAT if those genes are tested sequentially

**Subsequent need for CGP may vary, dependent on the composition of the panel and its underlying methodology.

ctDNA = circulating tumor DNA; IHC = immunohistochemistry; NGS = next-generation sequencing; NSCLC = non–small cell lung cancer; PD-L1 = programmed death ligand 1; SGT = single gene testing; TAT = turnaround time.

1. Rolfo C, et al. *J Thorac Oncol.* 2023;18(6):674-677. 2. Aggarwal C, et al. *Lung Cancer.* 2021;162:42-53. 3. Aggarwal C, et al. *JAMA Oncol.* 2023;9(6):758-760. 4. Hofman P, et al. *Lung Cancer.* 2025;201:108107. 5. Kidane B, et al. *J Thorac Cardiovasc Surg.* 2023;166(3):637-654. 6. Gobbini E, et al. *Cancers (Basel).* 2020;12(11):3112. 7. Guibert N, et al. *Eur Respir Rev.* 2020;29(155):190052. 8. Peng M, et al. *Front Oncol.* 2020;10:561598. 9. Adashek JJ, et al. *Cancers (Basel).* 2021;13(14):3600.