

Fact Sheet



Testing PD-L1 status in patients with lung cancer

- Information related to tumour programmed cell death ligand-1 (PD-L1) expression levels can help a physician determine the most appropriate therapeutic strategy in patients with lung cancer¹
- Multiple assays for assessing tumour PD-L1 expression by immunohistochemistry (IHC) have been, or are being, developed²
- In order to carry out PD-L1 testing, appropriate tumour tissue samples are required; the way in which these samples are obtained and processed can impact the success of PD-L1 testing

- Core needle, bronchoscopic forceps** or **surgical biopsies** can be used to obtain a histological sample in lung cancer^{3,4}
- Alternatively, **endobronchial ultrasound guided transbronchial needle aspiration (EBUS-TBNA)** is recommended by guidelines as a minimally invasive technique that yields a cytological specimen^{5,6}



Appropriate samples for PD-L1 testing

Sample type

- Routinely processed, formalin-fixed, paraffin-embedded tumour biopsy samples, with an adequate number of viable cells (usually ≥ 100) are preferred for use with PD-L1 testing assays⁷⁻⁹
- A number of assays have been validated for PD-L1 testing in cytology samples and could therefore provide an alternative option when histological samples are not available¹⁰

Sample Age

- Newly acquired and archival tumour biopsies can be used as long as they adhere to standard sample preparation and processing procedures¹¹

Sample Location

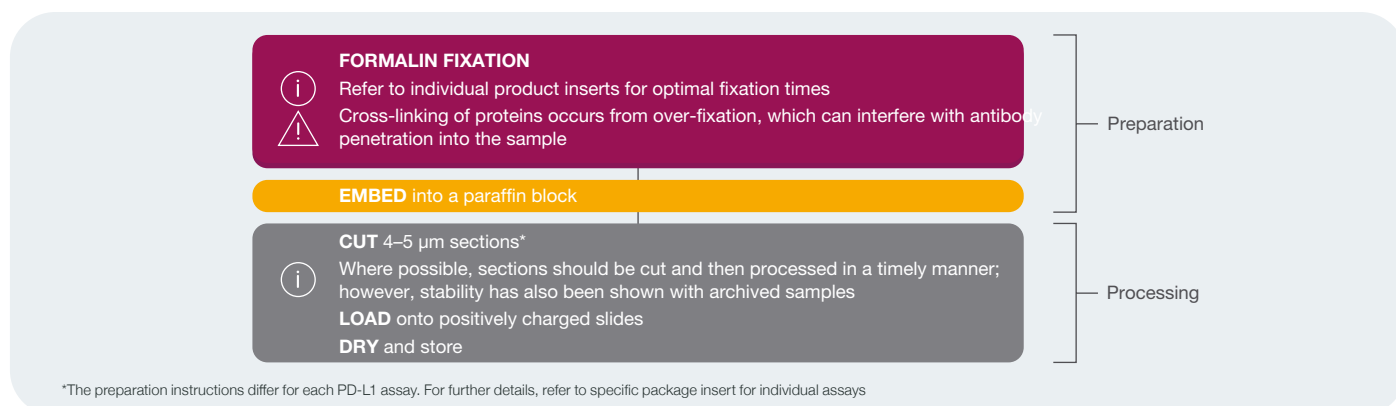
- Samples obtained from either primary or metastatic lesions can be used for PD-L1 testing¹²



Tissue sample preparation and processing

- Standard preparation and processing procedures should be performed once tumour samples have been obtained
- Preparation instructions for historical samples differ for each PD-L1 assay.⁷⁻⁹ Failure to follow these instructions may compromise the subsequent success of PD-L1 testing

Overview of basic tissue processing procedures for PD-L1 testing in histological samples^{*7-9,14}

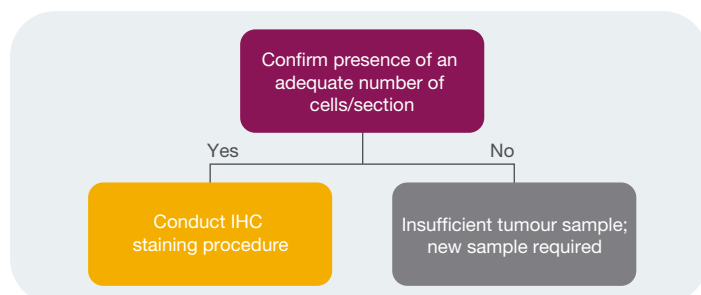


- Cytological tumour samples derived from lymph nodes or pleural fluids, can be processed as a cell block for use with PD-L1 IHC^{3,5}
- Further investigation is needed to establish this in practice



Pathologist review to confirm quality of samples

Pathologist QC (basic overview)^{7-9,13}



- Before processed tissue samples are used for PD-L1 testing, it is important that they are assessed for their suitability^{8,9}
- If samples are not adequate for testing, alternative samples should be sought, or rebiopsy should be considered^{8,9,13}



Summary

- Tumour PD-L1 expression levels are important for the selection of therapy in patients with lung cancer
- The use of appropriate tissue samples, and their correct preparation and processing is critical in ensuring the success and validity of PD-L1 testing by IHC

References

1. Sun C, et al. Regulation and function of the PD-L1 checkpoint. *Immunity* 2018;48:434–52
2. Tsao M, et al. PD-L1 immunohistochemistry comparability study in real-life clinical samples: results of blueprint phase 2 project. *J Thorac Oncol* 2018;13:1302–11
3. Heymann JJ, et al. PD-L1 expression in non-small cell lung carcinoma: comparison among cytology, small biopsy, and surgical resection specimens. *Cancer Cytopathol* 2017;125:896–907
4. Dietel M, et al. Diagnostic procedures for non-small-cell lung cancer (NSCLC): recommendations of the European Expert Group. *Thorax* 2016;71:177–84
5. Silvestri GA, et al. Methods for staging non-small cell lung cancer. *Chest* 2013;143(Suppl. 5):e211–50
6. Planchard D, et al. Metastatic non-small cell lung cancer: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up. *Ann Oncol* 2018;29:192–237
7. VENTANA PD-L1 (SP263) Assay website. Available at: <https://diagnostics.roche.com/global/en/products/tests/ventana-pd-l1-sp263-assay2.html> (accessed December 2023)
8. PD-L1 IHC 22C3 pharmDx website. Available at: <https://www.agilent.com/en/product/pharmdx/pd-l1-ihc-22c3-pharmdx-overview> (accessed December 2023)
9. PD-L1 IHC 28-8 pharmDx website. Available at: <https://www.agilent.com/en/product/pharmdx/pd-l1-ihc-28-8-overview> (accessed December 2023)
10. Ilie M, et al. Use of the 22C3 anti-programmed death-ligand 1 antibody to determine programmed death-ligand 1 expression in cytology samples obtained from non-small cell lung cancer patients. *Cancer Cytopathol* 2018;126:264–74
11. Herbst RS, et al. Use of archival versus newly collected tumour samples for assessing PD-L1 expression and overall survival: an updated analysis of KEYNOTE-010 trial. *Ann Oncol* 2019;30:281–9
12. Munari E, et al. PD-L1 expression comparison between primary and relapsed non-small cell lung carcinoma using whole sections and clone SP263. *Oncotarget* 2018;9:30465–71
13. Cree IA, et al. PD-L1 testing for lung cancer in the UK: recognizing the challenges for implementation. *Histopathology* 2016;69:177–86
14. VENTANA PD-L1 (SP142) Assay website. Available at: <https://diagnostics.roche.com/global/en/products/lab/pd-l1-sp142-assay-us-export-ventana-rt001232.html> (accessed December 2023)