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## Overview

**Useful For**

Identification of neoplasms expressing programmed cell death 1-ligand 1 (clone 22C3)

**Method Name**

Immunohistochemistry (IHC)

**NY State Available**

Yes

## Specimen

**Specimen Type**

Special

**Ordering Guidance**

In patients with specific tumor types, programmed death-ligand 1 (PD-L1) immunohistochemistry (IHC) is indicated to predict response to treatment with PD-L1 inhibitors. The specific PD-L1 clone, scoring method, and eligibility requirements depend on the tumor type, stage of malignancy, previous treatment outcomes, and specific PD-L1 inhibitor under consideration. For assistance with PD-L1 test selection as well as answers to frequently asked questions, see [PD-L1 Immunohistochemistry Testing](#) on MayoClinicLabs.com.

**Shipping Instructions**

Attach the green "Attention Pathology" address label (T498) to the outside of the transport container before putting into the courier mailer.

**Necessary Information**

A pathology/diagnostic report and a brief history, including primary site of neoplasm, are required.

**Specimen Required**

This assay requires at least 100 viable tumor cells.

**Specimen Type:** Tissue

**Supplies:** Pathology Packaging Kit (T554)

**Submit:**

Formalin-fixed, paraffin-embedded tissue block

OR

3 Unstained glass, "positively charged" slides with 4-microns formalin-fixed, paraffin-embedded tissue

**Additional Information:** One slide will be stained with hematoxylin and eosin and returned.

### Forms

If not ordering electronically, complete, print, and send 1 of the following forms with the specimen:

[Immunohistochemical \(IHC\)/In Situ Hybridization \(ISH\) Stains Request \(T763\)](#)

[Oncology Test Request \(T729\)](#)

### Reject Due To

Decalcified paraffin embedded tissue	Reject
Wet/frozen tissue	Reject
Cytology smears	Reject
Nonformalin fixed tissue including alcohol-formalin-acetic acid (AFA), 95% ethanol, PREFER fixatives or zinc formalin	Reject
Nonparaffin embedded tissue	Reject
Noncharged slides	Reject
ProbeOn slides	Reject
Snowcoat slides	Reject

### Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Special	Ambient (preferred)		
	Refrigerated		

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**Clinical & Interpretive****Clinical Information**

Programmed cell death 1-ligand 1 (PD-L1), also known as B7 homolog 1 (B7-H1) or CD274, is a transmembrane protein involved in the regulation of cell-mediated immune responses through interaction with the receptor programmed death protein-1 (PD-1). PD-L1 has been identified as both a prognostic and theranostic marker in a variety of neoplasms. Overexpression of PD-L1 has been observed in carcinomas of the urinary bladder, lung, gastric and gastroesophageal junction, thymus, colon, pancreas, ovary, breast, kidney, and in melanoma and glioblastoma.

**Reference Values**

An interpretive report will be provided.

**Interpretation**

The results of the test will be reported in the form of scores. The scoring system is based on type and origin of tumor. If additional interpretation or analysis is needed, order PATHC / Pathology Consultation along with this test.

**Cautions**

Preclinical studies suggest that positive programmed cell death 1-ligand 1 immunohistochemistry in tumor cells may predict tumor response to therapy with immune checkpoint inhibitors. This result should not be used as the sole factor in determining treatment, as other factors (eg, tumor mutation burden and microsatellite instability) have also been studied as predictive markers.

This test has been validated for non-decalcified paraffin-embedded tissue specimens fixed in 10% neutral buffered formalin at Mayo Clinic in Rochester, Minnesota. Specimens are recommended to be placed in formalin within 1 hour of acquisition and fixed between 3 and 72 hours. This assay has not been validated on tissue or cellblocks subjected to alternative fixatives or decalcification.

Age of a cut paraffin section can affect immunoreactivity. Stability thresholds vary widely among published literature and are antigen dependent. Best practice is for paraffin sections to be cut within 6 weeks.

The charge of glass slides can be affected by environmental factors and subsequently may alter slide staining. Sending unsuitable glass slides can result in inconsistent staining due to poor slide surface chemistry.

Best practices for storage of positively charged slides:

- Minimize time slides are stored after being unpackaged
- Limit exposure to high humidity and heat
- Minimize exposure to plastics

**Clinical Reference**

1. Rimm DL, Han G, Taube JM, et al. A prospective, multi-institutional, pathologist-based assessment of 4 immunohistochemistry assay for PD-L1 expression in non-small cell lung cancer. *JAMA Oncol.* 2017;3(8):1051-1058. doi:10.1001/jamaoncol.2017.0013
2. Gaule P, Smithy JW, Toki M, et al. A quantitative comparison of antibodies to programmed cell death 1 Ligand 1. *JAMA*

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Oncol. 2017;3(2):256-259. doi:10.1001/jamaoncol.2016.3015

3. Sunshine JC, Nguyen P, Kaunitz G, et al. PD-L1 expression in melanoma: A quantitative immunohistochemical antibody comparison. Clin Cancer Res. 2017;23(16):4938-4944. doi:10.1158/1078-0432.CCR-16-1821

4. D'Incecco A, Andreozzi M, Ludovini V, et al. PD-1 and PD-L1 expression in molecularly selected non-small-cell lung cancer patients. Br J Cancer. 2015;112(1):95-102. doi:10.1038/bjc.2014.555

5. Mansfield AS, Roden AC, Peikert T, et al. B7-H1 expression in malignant pleural mesothelioma is associated with sarcomatoid histology and poor prognosis. J Thorac Oncol. 2014;9(7):1036-1040. doi:10.1097/JTO.000000000000177

6. Magaki S, Hojat SA, Wei B, So A, Yong WH. An Introduction to the performance of immunohistochemistry. Methods Mol Biol. 2019;1897:289-298. doi:10.1007/978-1-4939-8935-5\_25

## Performance

### Method Description

Immunohistochemistry on sections of paraffin-embedded tissue using Dako PD-L1 clone 22C3.(Unpublished Mayo method)

### PDF Report

No

### Day(s) Performed

Monday through Friday

### Report Available

5 to 7 days

### Specimen Retention Time

Until reported

### Performing Laboratory Location

Mayo Clinic Laboratories - Rochester Main Campus

## Fees & Codes

### Fees

- Authorized users can sign in to [Test Prices](#) for detailed fee information.
- Clients without access to Test Prices can contact [Customer Service](#) 24 hours a day, seven days a week.
- Prospective clients should contact their account representative. For assistance, contact [Customer Service](#).

### Test Classification

This test was developed using an analyte specific reagent. Its performance characteristics were determined by Mayo

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Clinic in a manner consistent with CLIA requirements. This test has not been cleared or approved by the US Food and Drug Administration.

**CPT Code Information**

88360

**LOINC® Information**

Test ID	Test Order Name	Order LOINC® Value
22C3	PD-L1 (22C3) SemiQuant IHC, Manual	85147-7

Result ID	Test Result Name	Result LOINC® Value
603763	Interpretation	59465-5
603764	Participated in the Interpretation	No LOINC Needed
603765	Report electronically signed by	19139-5
603766	Material Received	81178-6
603767	Disclaimer	62364-5
603768	Case Number	80398-1