MAYO CLINIC LABORATORIES

# Test Definition: NEUD1

Neuronal Differentiation 1 (NeuroD1), Technical Component only

## Overview

### Useful For

Subclassification of small cell lung carcinoma

### Reflex Tests

| Test Id | Reporting Name | Available Separately | Always Performed |
|---|---|---|---|
| IHTOI | IHC Initial, Tech Only | No | No |
| IHTOA | IHC Additional, Tech Only | No | No |

### Testing Algorithm

For the initial technical component only immunohistochemical (IHC) stain performed, the appropriate bill-only test ID will be reflexed and charged (IHTOI). For each additional technical component only IHC stain performed, an additional bill-only test ID will be reflexed and charged (IHTOA).

### Method Name

Immunohistochemistry (IHC)

### NY State Available

Yes

## Specimen

### Specimen Type

TECHONLY

### Ordering Guidance

This test includes only technical performance of the stain; **no pathologist interpretation is provided**.

Technical component only stains **should not** be ordered with PATHC / Pathology Consultation. If ordered with PATHC, the technical component stains **will be canceled**. Any immunohistochemistry (IHC)/in situ hybridization (ISH) stain performed as a part of the PATHC will be performed at the reviewing pathologist's discretion at an additional charge.

### Shipping Instructions

Attach the green "Attention Pathology" address label (T498) and the pink Immunostain Technical Only label included in the kit to the outside of the transport container.

### Specimen Required

**Supplies:** Immunostain Technical Only Envelope (T693)

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**Specimen Type:** Tissue
**Container/Tube:** Immunostain Technical Only Envelope
**Submit:**
Formalin-fixed, paraffin-embedded tissue block
OR
2 Unstained, positively charged glass slides (25- x 75- x 1-mm) per test ordered; sections 4-microns thick
**Additional Information**: Broken or cracked unstained slides will be rejected. Stained slides that were broken and repaired (ie, double mounted) at the client site will not be rejected, as, in most cases, they can still be reviewed under the microscope. However, due to the double mounting, digital scanning cannot be performed.

## Digital Image Access

1. Information on accessing digital images of immunohistochemical (IHC) stains and the manual requisition form can be accessed through this website: https://news.mayocliniclabs.com/pathology/digital-imaging/
2. Clients ordering stains using a manual requisition form will not have access to digital images.
3. Clients wishing to access digital images must place the order for IHC stains electronically. Information regarding digital imaging can be accessed through this website: https://news.mayocliniclabs.com/pathology/digital-imaging/#section3

## Forms

If not ordering electronically, complete, print, and send an Immunohistochemical (IHC)/In Situ Hybridization (ISH) Stains Request (T763) with the specimen.

## Reject Due To

| | |
|---|---|
| Wet/frozen tissue | Reject |
| Cytology smears | Reject |
| Nonformalin fixed tissue | Reject |
| Nonparaffin embedded tissue | Reject |
| Noncharged slides | Reject |
| ProbeOn slides | Reject |
| Broken or cracked unstained slides | Reject |
| Broken or cracked stained slides that cannot be repaired | Reject |

## Specimen Stability Information

| Specimen Type | Temperature | Time | Special Container |
|---|---|---|---|
| TECHONLY | Ambient (preferred) | | |
| | Refrigerated | | |

## Clinical & Interpretive

### Clinical Information

Neuronal Differentiation 1 (NeuroD1) is expressed in a variety of cancers including but not limited to colorectal, pancreatic, small cell (of cervix and lung), and neuroendocrine lung carcinomas and may play a major role in neuroendocrine differentiation. There are four major subclasses of small cell carcinoma of lung and cervix, one of which dominantly expresses NeuroD1. The subclassification of small cell lung carcinomas could provide distinct therapeutic options.

### Interpretation

This test does not include pathologist interpretation, only technical performance of the stain. If interpretation is required, order PATHC / Pathology Consultation for a full diagnostic evaluation or second opinion of the case.

The positive and negative controls are verified as showing appropriate immunoreactivity.

Interpretation of this test should be performed in the context of the patient's clinical history and other diagnostic tests by a qualified pathologist.

### Cautions

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.

Recommended fixation time is between 6 and 48 hours.

This assay has not been validated on tissues subjected to the decalcification process or use of alternative fixatives for bone and bone marrow specimens or cell blocks.

Broken or cracked unstained slides are not compatible with the instrumentation used in our performing laboratories and will be rejected. Additional material may be requested.

Attempts will be made to repair broken or cracked stained slides; however, if they are unable to be repaired (ie, shattered in transit), they will be rejected and discarded due to safety concerns.

### Clinical Reference

1. Li Z, He Y, Li Y, et al. NeuroD1 promotes tumor cell proliferation and tumorigenesis by directly activating the pentose phosphate pathway in colorectal carcinoma. Oncogene 2021 40:6738-6747
2. Wang Y, Su D, Gao L, et al. Effect of NeuroD gene silencing on the migration and invasion of human pancreatic cancer

cells PANC-1. Cell Biochem Biophys. 2014 69:487-494
3. Kim G, Kim M, Nam EJ, Lee JY, Park E. Application of Small Cell Lung Cancer Molecular Subtyping Markers to Small Cell Neuroendocrine Carcinoma of the Cervix: NEUROD1 as a Poor Prognostic Factor. Am J Surg Pathol. 2024;48(3):364-372
4. Osborne J, Larsen J, Shields M, et al. NeuroD1 regulates survival and migration of neuroendocrine lung carcinomas via signaling molecules TrkB and NCAM. Proc Natl Acad Sci USA. 2013 110:6524-6529
5. Gay C, Stewart C, Park E, et al. Patterns of transcription factor programs and immune pathway activation define four major subtypes of SCLC with distinct therapeutic vulnerabilities. Cancer Cell 2021 39:3(3)46-60
6. Baine M, Hsieh M, Lai V, et al: SCLC subtypes defined by ASCL1, NEUROD1, POU2F3, and YAP1: A comprehensive immunohistochemical and histopathologic characterization. J Thorc Oncol. 2020;15(12):1823-1835

## Performance

### Method Description
Immunohistochemistry on sections of paraffin-embedded tissue.(Unpublished Mayo method)

### PDF Report
No

### Day(s) Performed
Monday through Friday

### Report Available
1 to 3 days

### Specimen Retention Time
Until staining is completed

### 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 and its performance characteristics determined by Mayo Clinic in a manner consistent with CLIA requirements. It has not been cleared or approved by the US Food and Drug Administration.

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## CPT Code Information

88342-TC, Primary
88341-TC, If additional IHC

## LOINC® Information

| Test ID | Test Order Name | Order LOINC® Value |
|---|---|---|
| NEUD1 | NeuroD1 IHC, Tech Only | No LOINC Needed |

| Result ID | Test Result Name | Result LOINC® Value |
|---|---|---|
| 622268 | NeuroD1 IHC, Tech Only | No LOINC Needed |