MAYO CLINIC LABORATORIES

Test Definition: EM

Electron Microscopy, Varies

Overview

Useful For

Providing information to aid in the diagnosis of medical disorders such as storage diseases, CADASIL (cerebral autosomal dominant arteriopathy with subcortical infarcts and leukoencephalopathy), and primary ciliary dyskinesia

Special Instructions

- Electron Microscopy Patient Information
- Electron Microscopy Procedures of Handling Specimens for Electron Microscopy

Highlights

For more information see Primary Ciliary Dyskinesia.

Method Name

Electron Microscopy

NY State Available

Yes

Specimen

Specimen Type

EM

Ordering Guidance

Tumor biopsies are only accepted as part of a pathology consultation, order PATHC / Pathology Consultation.

For nontumorous renal specimens, order RPCWT / Renal Pathology Consultation, Wet Tissue.

For platelet disorders, order PTEM / Platelet Transmission Electron Microscopic Study, Whole Blood.

For muscle specimens, order MBX / Muscle Pathology Consultation.

For CADASIL (cerebral autosomal dominant arteriopathy with subcortical infarcts and leukoencephalopathy) genetic testing, order NTC3Z / *NOTCH3* Gene, Full Gene Analysis, Varies.

For cardiac specimens, order ANPAT / Anatomic Pathology Consultation, Wet Tissue.

For neuronal ceroid lipofuscinosis (NCL) testing, see NCLW / Neuronal Ceroid Lipofuscinosis, Two-Enzyme Panel, Leukocytes or NCLGP / Neuronal Ceroid Lipofuscinosis (Batten Disease) Gene Panel, Varies

Shipping Instructions

Whole blood specimens must arrive within 48 hours of collection.

Necessary Information

Failure to supply the following documentation will result in a testing delay:

1. Completed Electron Microscopy Patient Information must be submitted with each specimen.

2. Tissue source and reason for electron microscopy must be indicated for testing to be performed.

Specimen Required

Specimen Type: Fixed wet tissue

Supplies: Electron Microscopy Kit (T660)

Container/Tube: Electron Microscopy Kit or leak-proof container

Specimen Volume: Entire specimen

Collection Instructions: Collect specimen according to the instructions in Electron Microscopy Procedures of Handling Specimens for Electron Microscopy. **Do not place on ice, dry ice, or freeze**.

Additional Information:

1. PATHC / Pathology Consultation may be added if deemed necessary by the reviewing pathologist.
2. **Liver/gastrointestinal and hair shaft specimens are not acceptable**. Testing will be canceled if one of these specimen types is received.

For neuronal ceroid lipofuscinosis (NCL) testing only

Specimen Type: Whole blood

Container/Tube: Green top (sodium heparin) or yellow top (ACD solution B)

Specimen Volume: 5 mL

Collection Instructions: Send whole blood specimen in original tube. **Do not aliquot**.

Additional Information: If test indication is for NCL, whole blood may be submitted in lieu of fixed wet tissue. This is only applicable for a presumptive diagnosis of NCL; **whole blood specimens submitted for any other reason will be rejected**.

Forms

1. **Electron Microscopy Patient Information is required.**
2. Electron Microscopy Procedures of Handling Specimens for Electron Microscopy
3. Pathology/Cytology Information (T707)

Specimen Minimum Volume

See Specimen Required

Reject Due To

Muscle tissue	Reject
Fat pads	Reject
Hair shaft	Reject
Liver/gastrointestinal tissue	Reject

Specimen Stability Information

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

Clinical & Interpretive

Clinical Information

Transmission electron microscopy is an important diagnostic tool used in the comprehensive assessment of human disease and is most often used in conjunction with other methods such as light microscopy and immunohistopathological techniques. This fundamental technology can provide both confirmatory and diagnostic value to the pathologist and clinician.

Reference Values

An interpretive report will be provided.

Interpretation

The images and case histories are correlated and interpreted by a pathologist who is an expert in the field of the suspected diagnoses.

Results will be provided by telephone. If requested, representative images showing diagnostic features will be sent.

Cautions

Certain factors are necessary for interpretation of electron microscopic images as follows:
-Optimal fixation of viable and representative tissue is imperative.
-The tissue submitted must have been viable at the time of fixation.

Clinical Reference

1. Jennette JC, D'Agati VD, eds. Heptinstall's Pathology of the Kidney. 7th ed. Wolters Kluwer; 2023
2. Shoemark A, Boon M, Brochhausen C, et al. International consensus guideline for reporting transmission electron microscopy results in the diagnosis of primary ciliary dyskinesia (BEAT PCD TEM Criteria). Eur Respir J. 2020;55(4):1900725. doi:10.1183/13993003.00725-2019
3. Schroder JA. Diagnostic transmission electron microscopy. Imaging and Microscopy. 2012. Accessed April 16, 2026. Available at https://analyticalscience.wiley.com/content/article-do/diagnostic-transmission-electron-microscopy

Performance

Method Description

The fixed tissues received are postfixed and stained in osmium tetroxide, dehydrated, and embedded in epoxy resin. Resin blocks are trimmed and semithin (1-micron) survey sections stained with toluidine blue are viewed using a light microscope. Blocks of interest are retrimmed, and the area for observation is then ultrathin sectioned, placed on copper mesh grids, and stained with lead citrate. The sections are examined with a transmission electron microscope operated at an appropriate kV. Images are digitally captured and stored electronically.(Winey M, Meehl JB, O'Toole ET, Giddings TH Jr. Conventional transmission electron microscopy. Mol Biol Cell. 2014;25[3]:319-23. doi:10.1091/mbc.E12-12-0863)

PDF Report
No

Day(s) Performed
Monday through Friday

Report Available
5 to 10 days

Specimen Retention Time
Residual tissue: 2 months

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 has been cleared, approved, or is exempt by the US Food and Drug Administration and is used per manufacturer's instructions. Performance characteristics were verified by Mayo Clinic in a manner consistent with CLIA requirements.

CPT Code Information
88348

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
EM	Electron Microscopy	34166-9

Result ID	Test Result Name	Result LOINC® Value
71033	Interpretation	59465-5
71034	Participated in the Interpretation	No LOINC Needed
71035	Report electronically signed by	19139-5
71037	Material Received	81178-6
71788	Case Number	80398-1