

## Overview

### Useful For

Evaluation of patients with suspected POEMS (polyneuropathy, organomegaly, endocrinopathy, monoclonal gammopathy, and skin changes) syndrome, particularly in differentiating from other forms of polyneuropathy and/or monoclonal plasma cell disorders

### Special Instructions

- [Acquired Neuropathy Diagnostic Algorithm](#)

### Method Name

Electrochemiluminescence Immunoassay (ECLIA)

### NY State Available

Yes

## Specimen

### Specimen Type

Plasma EDTA

### Specimen Required

**Supplies:** Sarstedt Aliquot Tube, 5 mL (T914)

**Collection Container/Tube:** Lavender-top (EDTA)

**Submission Container/Tube:** Plastic vial

**Specimen Volume:** 0.5 mL

#### Collection Instructions:

1. Immediately after specimen collection, place the tube on wet ice.
2. Centrifuge at 4 degrees C, 1500 x *g* for 10 minutes.
3. Aliquot plasma into plastic vial.
4. Freeze specimen within 2 hours of collection.

### Specimen Minimum Volume

0.3 mL

### Reject Due To

Gross hemolysis	OK
Gross lipemia	Reject
Gross icterus	Reject

Heat-treated	Reject
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## Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Plasma EDTA	Refrigerated	24 hours	
	Frozen (preferred)	21 days	

## Clinical & Interpretive

### Clinical Information

Vascular endothelial growth factor (VEGF) is a critical modulator of angiogenesis (the growth of new blood vessels).(1) In mammals, there are 5 members of the VEGF family, each arising from different genes, with VEGF-A being the most well-studied. VEGF-A promotes angiogenesis by inducing migration of endothelial cells, promoting mitosis of endothelial cells, and upregulating matrix metalloproteinase activity.(2) VEGF-A is regulated by hypoxia, with increased expression when cells detect an environment low in oxygen. Physiologically, VEGF induces new blood vessel formation during embryonic development, after tissue injury, and in response to blocked vessels.

VEGF also regulates pathological vessel formation, such as in tumor growth and metastases.(3) Angiogenesis during tumor development is complex, although it is clear that VEGF plays a key role. VEGF also regulates angiogenesis in other disease states including rheumatoid arthritis, osteoarthritis, diabetes, and age-related macular degeneration. In addition, circulating concentrations of VEGF are elevated in patients with polyneuropathy, organomegaly, endocrinopathy, monoclonal gammopathy, and skin changes (POEMS) syndrome, a monoclonal plasma cell disorder.(4) Although the pathologic role of VEGF in POEMS is unclear, it is useful as a diagnostic marker and for assessing response to therapy.

In addition to the various genes in the VEGF family, VEGFA has multiple splicing variants. VEGFA 165 is the predominant isoform.(2) An internal study has demonstrated that the VEGF assay used by Mayo Clinic Laboratories is specific for the splice variant of VEGF-A 165 and does not detect other isoforms of VEGFA or other VEGF gene products.

### Reference Values

< or =96.2 pg/mL

### Interpretation

Elevated concentration of vascular endothelial growth factor (VEGF) may be consistent with a diagnosis of POEMS (polyneuropathy, organomegaly, endocrinopathy, monoclonal gammopathy, and skin changes) syndrome.

Decreasing concentrations of VEGF over time in a patient with POEMS syndrome may be consistent with a therapeutic response.

### Cautions

Elevated circulating concentrations of vascular endothelial growth factor (VEGF) may be observed in a variety of disease states, especially those associated with angiogenesis. Elevated concentrations of VEGF must be interpreted within the clinical context of the patient.

Normal concentrations of VEGF do not exclude the diagnosis of POEMS (polyneuropathy, organomegaly, endocrinopathy, monoclonal gammopathy, and skin changes) syndrome.

VEGF has limited stability. Following centrifugation, plasma must be either immediately frozen or refrigerated. Samples can only be stored at refrigerated temperatures for 24 hours, after which time samples must be frozen. Storage of plasma for any length of time at room temperature is not acceptable.

The presence of bevacizumab in patient serum interferes with detection of VEGF. Caution should be taken while interpreting results of patients receiving bevacizumab therapy.

### Clinical Reference

1. Apte RS, Chen DS, Ferrara N. VEGF in signaling and disease: Beyond discovery and development. *Cell*. 2019;176(6):1248-1264
2. Otrrock ZK, Makarem JA, Shamseddine AI. Vascular endothelial growth factor family of ligands and receptors: review. *Blood Cells Mol Dis*. 2007;38(3):258-268
3. Siveen KS, Prabhu K, Krishnankutty R, et al. Vascular endothelial growth factor (VEGF) signaling in tumour vascularization: Potential and challenges. *Curr Vasc Pharmacol*. 2017;15(4):339-351
4. Brown R, Ginsberg L. POEMS syndrome: clinical update. *J Neurol*. 2019;266(1):268-277

### Performance

#### Method Description

The vascular endothelial growth factor (VEGF) cytokine assay measures human cytokines in a 96-well spotted plate. The assay employs a sandwich immunoassay format where capture antibodies are coated on a single spot on the bottom of each well. Diluted samples, calibrators, and controls are added and to the plate. If present, VEGF will bind to the capture antibodies. After incubation, a solution containing detection antibodies conjugated with electrochemiluminescent labels is added. After a final incubation, a buffer is added that creates the appropriate chemical environment for electrochemiluminescence. The plate is then read on the QuickPlex SQ120. The machine applies a voltage that causes bound labels to emit measurable light. The QuickPlex SQ120 measures the intensity of emitted light and correlates it to a set of standards of known quantity via a 4-point logistics curve fitting method.(Unpublished Mayo method)

#### PDF Report

No

#### Day(s) Performed

Tuesday, Thursday

#### Report Available

2 to 7 days

#### Specimen Retention Time

14 days

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**Performing Laboratory Location**

Rochester

**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.

**CPT Code Information**

83520

**LOINC® Information**

Test ID	Test Order Name	Order LOINC® Value
VEGF	Vascular Endothelial Growth Fctr, P	34694-0

  

Result ID	Test Result Name	Result LOINC® Value
63019	VEGF, P	34694-0