MAYO CLINIC LABORATORIES

Test Definition: F5DNA

Factor V Leiden (R506Q) Mutation, B

Overview

Useful For

Patients with clinically suspected thrombophilia and:

1. Activated protein C (APC)-resistance either proven or suspected by a low or borderline APC-resistance ratio

or

2. A family history of factor V Leiden

Genetics Test Information

This test detects the *F5* c.1601G>A; p.Arg534Gln variant (legacy R506Q).

Special Instructions

- Informed Consent for Genetic Testing
- Coagulation Patient Information
- Informed Consent for Genetic Testing (Spanish)

Method Name

Direct Variant Analysis

NY State Available

Yes

Specimen

Specimen Type

Whole blood

Ordering Guidance

This assay will only detect the *F5* c.1601G>A; p.Arg534Gln (rs6025) variant associated with factor V Leiden thrombophilia. To detect other pathogenic alterations in the *F5* gene of a patient with a laboratory diagnosis of coagulation factor V deficiency, order F5NGS / *F5* Gene Next Generation Sequencing, Varies.

This assay will not will not detect alterations in individuals with activated protein C (APC)-resistance caused by mechanisms other than the *F5*:c.1601G>A, p.Arg534Gln variant. Coagulation-based activated protein C (APC)-resistance ratio (mixing with factor V-deficient plasma) is recommended as the initial screening assay for APC-resistance. Depending on the assay system, the APC-resistance ratio may be indeterminate for patients with a lupus anticoagulant

or extremely high heparin levels. For more information, see APCRV / Activated Protein C Resistance V (APCRV), Plasma or APCRR / Activated Protein C Resistance V (APCRV), with Reflex to Factor V Leiden, Blood and Plasma.

Specimen Required

Patient Preparation: A previous bone marrow transplant from an allogenic donor will interfere with testing. Call 800-533-1710 for instructions for testing patients who have received a bone marrow transplant.

Container/Tube:

Preferred: Lavender top (EDTA)

Acceptable: Yellow top (ACD solution B), light-blue top (sodium citrate)

Specimen Volume: 3 mL

Collection Instructions:

1. Invert several times to mix blood.

2. Send specimen in original tube. **Do not** aliquot.

Forms

1. **New York Clients-Informed consent is required.** Document on the request form or electronic order that a copy is on file. The following documents are available in Special Instructions:

-Informed Consent for Genetic Testing (T576)

-Informed Consent for Genetic Testing-Spanish (T826)

2. Coagulation Patient Information (T675) in Special Instructions

Reject Due To

Gross hemolysis	OK
Gross lipemia	OK
Extracted DNA	Reject

Specimen Minimum Volume

1 mL

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Whole blood	Ambient (preferred)	14 days	

	Frozen	14 days	
	Refrigerated	14 days	

Clinical & Interpretive

Clinical Information

Venous thromboembolism includes deep vein thrombosis and its complication, pulmonary embolism. Plasma from 12% to 20% of venous thromboembolism patients is resistant to the anticoagulant effect of activated protein C (APC resistance). Essentially all patients with hereditary APC resistance have the factor V Leiden, *F5* c.1601G>A, p.Arg534Gln (legacy R506Q) variant.

Reference Values

Negative

Interpretation

The results will be reported as:

-Negative for the *F5* c.1601G>A, p.Arg534Gln variant

-Heterozygous for the *F5* c.1601G>A, p.Arg534Gln variant

-Homozygous for the *F5* c.1601G>A, p.Arg534Gln variant

Cautions

This assay will only detect the genetic basis for activated protein C (APC)-resistance due to the *F5* c.1601G>A, p.Arg534Gln variant. This assay will not detect the genetic basis for APC resistance due to other variants nor the acquired APC resistance.

This assay will not detect alterations in individuals with thrombophilia caused by mechanisms other than the *F5* c.1601G>A, p.Arg534Gln variant.

Rare single nucleotide variants under the primers can cause preferential amplification of one allele. In many cases, there is no indication that this interference has occurred. Consequently, the analysis could be done on data from only one allele, which may cause a false-negative result or an incorrect allele frequency (homozygous instead of heterozygous).

Discrepancy between the APC resistance assay and the DNA based *F5* c.1601G>A, p.Arg534Gln assay may be observed in patients receiving allogenic stem cell transplants or liver transplants.

Consultations with the Mayo Clinic Special Coagulation Clinic Thrombophilia Center, and/or Medical Genetics are available and may be especially helpful in complex cases or in situations in which the diagnosis is atypical or uncertain. Genetic counseling is recommended before testing asymptomatic family members.

Clinical Reference

1. Dahlback B, Carlsson M, Svensson PR: Familial thrombophilia due to a previously unrecognized mechanism characterized by poor anticoagulant response to activated protein C: prediction of a cofactor to activated protein C. Proc Natl Acac Sci USA. 1993;90:1004-1008

2. Bertina RM, Koeleman BP, Koster T, et al: Mutation in blood coagulation factor V associated with resistance to activated protein C. Nature. 1994;369:64-67

3. Zoller B, Svensson PJ, He X, Dahlback B: Identification of the same factor V gene mutation in 47 out of 50 thrombosis-prone families with inherited resistance to activated protein C. J Clin Invest. 1994;94:2521-2524

4. Freed J, Bauer KA: Thrombophilia: clinical and laboratory assessment and management. In: Kitchens CS, Kessler CM, Konkle BA, Streiff MB, Garcia DA, eds. Consultative Hemostasis and Thrombosis. 4th ed. Elsevier; 2019:242-265

Performance

Method Description

An allelic discrimination assay is set up using TaqMan chemistry. End-products are analyzed using a real-time polymerase chain reaction instrument for genotype detection.(Package insert: TaqMan SNP Genotyping Assays. Applied Biosystems; 2014)

PDF Report

No

Specimen Retention Time

Whole blood: 2 weeks

Performing Laboratory Location

Rochester

Fees & Codes

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Test Classification

This test was developed, and its performance characteristics determined by Mayo 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

81241

LOINC® Information

Test ID	Test Order Name	Order LOINC Value
F5DNA	Factor V Leiden (R506Q) Mutation, B	21668-9

Result ID	Reporting Name	LOINC®
21838	Factor V Leiden (R506Q) Mutation, B	21668-9
21839	F5DNA Interpretation	69049-5
21841	F5DNA Reviewed By	18771-6