

---

**Lab Dept:** Coagulation

**Test Name:** **ACTIVATED PROTEIN C RESISTANCE**

---

***General Information***

**Lab Order Codes:** APCRB

**Synonyms:** APC resistance; APCR; Screen for Factor V Leiden

**CPT Codes:** 85307 – Activated Protein C (APC) resistance assay

**Test Includes:** APCR ratio

---

***Logistics***

**Test Indications:** Useful for diagnosing patients who are predisposed to thrombosis and are not responding appropriately to anticoagulant therapy. Used as a screen to rule out the presence of Factor V Leiden.

**Lab Testing Sections:** Coagulation (Minneapolis Campus)

**Phone Numbers:** MIN Lab: 612-813-6280

STP Lab: 651-220-6550

**Test Availability:** Monday – Friday (0630 – 1500)

**Turnaround Time:** 1 – 3 days

**Special Instructions:** Test can be performed on patients on Coumadin and/or heparin. Test cannot be performed on patients on argatroban or like products.

---

***Specimen***

**Specimen Type:** Whole blood

**Container:** Light Blue top (Buffered Na citrate 3.2%) tube

**Draw Volume:** 2.7 mL blood in a 3 mL tube (Minimum: 1.8 mL in a 2 mL tube)

**Processed Volume:** Minimum 1.8 ml (plasma).

**Collection:**

**Special Processing:** Lab Staff: All testing will be performed in Minneapolis.

St.Paul Lab: Send whole blood specimens to Mpls.

For processing via courier. Must be processed within 4 hours of collection. Contact Mpls prior to sending. If there will be a delay in delivery, the sample should be spun, plasma removed and spun again. Aliquot spun plasma into a screw-capped plastic vial and freeze at -70. Send frozen plasma.

**Patient Preparation:** Patient should not be receiving argatroban or like products

**Sample Rejection:** Improper tube; clotted sample; underfilled tube; mislabeled or unlabeled specimens

---

***Interpretive***

**Reference Range:**

APC Ratio	Interpretation
<1.5	Suggests Factor V Leiden is present
1.5 - 2.0	Borderline
>2.0	Unlikely Factor V mutation is present

**Clinical Interpretation:** Functional clotting test for resistance to activated Protein C: Up to 90% of activated Protein C resistance is caused by Factor 5 Leiden mutation which can be detected using PCR molecular testing.

If APCR is positive (or borderline), Factor 5 Leiden is recommended

If APCR is positive and Factor 5 Leiden is negative, APCR is likely due to another mutation (10 – 15% of cases).

If APCR is negative, it is unlikely any Factor 5 mutation is present.

**Critical Values:** N/A

**Limitations:** Test cannot be performed on patients on argatroban or like products.

**Methodology:** The Siemens Factor V Leiden Assay is based on the activation of endogenous Protein C by incubation of plasma with Agkistrodon contortrix (Southern Copperhead) venom. A dilute Russells Viper Venom time (DRVVT) is then performed on the plasma. The DRVVT is sensitive to prolongation in the presence of APC.

**References:**

Factor V Leiden Assay (May 2005) Siemens Package Insert, Siemens Healthcare Diagnostics, Marburg Germany

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

Dahlback B (1994) Physiological anticoagulation. Resistance to activated protein C and venous thrombo-embolism. J Clin Invest; 94 923-7.

Thrombophilia Powerpoint presentation Kandice Kottke-Marchant M.D. PhD.

[http://aniaracorp.s3.amazonaws.com/PhyFiles/Thrombophilia2/Marchant\\_medium.wmv](http://aniaracorp.s3.amazonaws.com/PhyFiles/Thrombophilia2/Marchant_medium.wmv)

An Algorithmic Approach to Hemostasis Testing Kottke-Marchant (2008) CAP Press

ProC Control Plasma package insert (May 2008) Siemens Healthcare Diagnostics, Marburg Germany

Application Sheet for Factor V Leiden Assay on the BCA and BCS XP System.

An Algorithmic Approach to Hemostasis Testing (2008) Kottke-Marchant, CAP Press

Control Plasma N package insert (December 2007) Siemens Healthcare Diagnostics, Newark, DE

**Updates:**

2/6/2012: Test moved from referral to Fairview University to being performed at inhouse at Children's Laboratory.

9/15/2014: Added Offsite Campus collection info