



## Factor V Leiden Mutation Analysis

Activated protein C (APC) is a serine protease that limits clot formation during normal hemostasis by proteolytic cleavage of factors Va and VIIIa. In some patients plasma does not exhibit the normal anticoagulant response to addition of APC; such patients are said to demonstrate resistance to APC. The APC resistance phenotype has been shown to be associated with heterozygosity or homozygosity for a single point mutation in the APC cleavage site of factor V (the Leiden mutation). This mutation in the factor V gene at nucleotide position 1691 change a G to an A predicting the replacement of Arginine (CGA) at codon 506 by Glutamine (CAA) and the synthesis of a factor V molecule that is not properly inactivated by APC.

This assay is performed using the Invader® platform from Third Wave Technologies (<http://www.twt.com>) which applies two hybridization probes for normal and mutant sequences to non-amplified DNA isolated from peripheral blood white cells. The formation of distinctive structures between probe and patient DNA in the presence of the target sequence allows enzymatic digestion and release of a fluorescent marker. A customized report is generated which takes into account family history (if provided) and the inheritance pattern of this disorder.

APC resistance is a common risk factor for thrombosis. Individuals heterozygous for the factor V Leiden mutation appear to be at an ~8 fold greater risk for thrombosis that becomes significant with increasing age. Individuals homozygous for the Factor V Leiden mutation have a high risk of thrombosis that occurs in adulthood and these patients may benefit from short-term prophylaxis with anticoagulants in risk situations such as oral contraceptive use, pregnancy, length immobilization, etc.

Patients who are positive (either heterozygous or homozygous) for the factor V Leiden mutation, which is associated with increased risk of thrombosis, should also be tested for the prothrombin 20210G>A variant because thrombotic risk is increased in more than an additive fashion in the presence of both abnormalities.

**Turnaround Time:** 5-7 business days.

**Specimen Requirements:** See Oncology/Genetics Specimen Handling Protocol or Molecular Diagnostics Genetics Requisition Form.

**Informed Consent:** It is the responsibility of the referring health care professional to obtain proper informed consent from the patient for genetic testing. Test results are released only to the primary referring physician and/or genetic counselor. The laboratory report contains information that may be useful for genetic counseling of the patient and/or family members, although adjunct use of an experienced genetic counselor or medical geneticist may be beneficial for this genetic disorder.