



Factor II (Prothrombin 20210G>A) Analysis

Prothrombin is the precursor of the serine protease thrombin, a key enzyme in hemostasis and thrombosis which exhibits procoagulant, anticoagulant, and antifibrinolytic activities. Prothrombin is encoded by a 21 kb gene on chromosome 11 (11p11-q12) which contains 14 exons. A G to A transition at nucleotide position 20210 (20210G>A) in the 3' untranslated region of the gene was found in 18% of selected patients with a personal and family history of venous thrombosis. Heterozygous carriers of this mutation have higher plasma prothrombin levels than controls with the normal genotype, and have a 2.8-fold increased risk of venous thrombosis. Thrombotic risk is even higher in those homozygous for the 20210A variant.

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

The 20210G>A sequence variation in the prothrombin gene is a moderate risk factor for venous thrombosis because this mutation is associated with elevated prothrombin levels which may lead to an imbalance between the procoagulant, anticoagulant, and fibrinolytic system. This could result in increased rates of thrombin generation, and therefore lead to excessive growth of fibrin clots. Patients who are positive (either heterozygous or homozygous) for the 20210A variant, which is associated with increased risk of thrombosis, should also be tested for the factor V Leiden mutation 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.