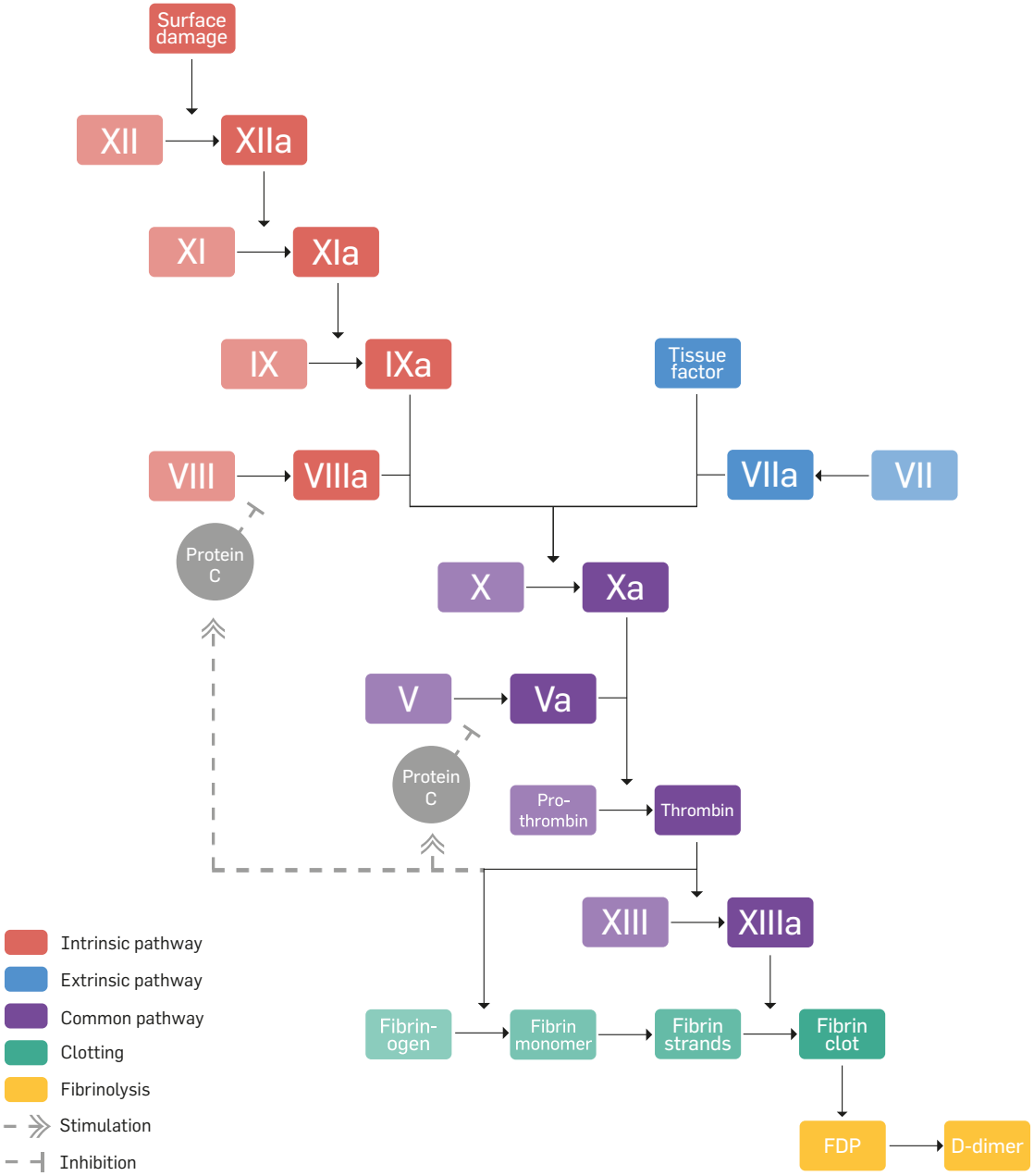
NORDIC BIOMARKER

Protein C

Protein C and Its Functions

Protein C is a vitamin K dependent protein synthesized in the liver and is inactive in its innate form. Upon activation by thrombin, protein C together with the cofactor protein S limits coagulation by degrading factor VIIIa and factor Va, and thus decreases the risk of a thrombotic event. Patients with protein C deficiency have a reduced ability to limit coagulation and are therefore more prone to thrombotic events.



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Protein C Deficiency

Protein C deficiency is a medical condition that increases the risk of a thrombotic event. The disease is mainly inherited but can also be acquired by various diseases and drugs (see list below). Patients with inherited protein C deficiency can be either heterozygotes or homozygotes for protein C, that is having inherited a gene from one or both parents for protein C deficiency. Heterozygotes are generally not as heavily affected as homozygotes, but still have an increased risk of thrombosis compared to healthy individuals.

Conditions and drugs associated with decreased levels of protein C

- Direct oral anticoagulants
- Vitamin K deficiency
- Chemotherapy
- Disseminated intravascular coagulation (DIC)
- Surgery
- Recent thrombosis
- Liver dysfunction

Two Types of Protein C Deficiency

There exists two forms of protein C deficiency, type I and type II. In type I protein C deficiency the concentration of protein C in plasma is decreased. Patients with type II protein C deficiency have a normal plasma concentration of protein C, but the activity of protein C is reduced.

Treatment

Patients diagnosed with protein C deficiency is commonly treated with anticoagulant drugs e.g. warfarin and heparin to prevent thrombotic recurrence.

Testing for Protein C

Protein C analyses are typically used for patients with

- recurrent thrombotic events
- thrombotic manifestation at an early age
- known family history of protein C deficiency.

MRX Protein C (see below) belongs to the group of specialty coagulation tests and is often analyzed in conjunction with several other coagulation tests e.g., protein S and antithrombin. A palette of coagulation tests is usually needed to fully evaluate the underlying causes of the patients' medical condition.

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A Closer Look: MRX Protein C

MRX Protein C is a chromogenic test for quantitative determination of protein C activity in citrated human plasma as an aid in diagnosis of protein C deficiency.

MRX Protein C consists of two liquid components: Protein C Activator and Protein C Substrate. When a plasma sample is mixed with the Protein C Activator, all endogenous functional protein C is activated. The level of activated protein C in the plasma sample is quantified by adding a substrate that is specifically hydrolyzed by activated protein C. The pNA released when the substrate is cleaved is proportional to the protein C level in the sample.

Since MRX Protein C measures protein C activity, both type I and type II protein C deficiency are covered by the analysis.