

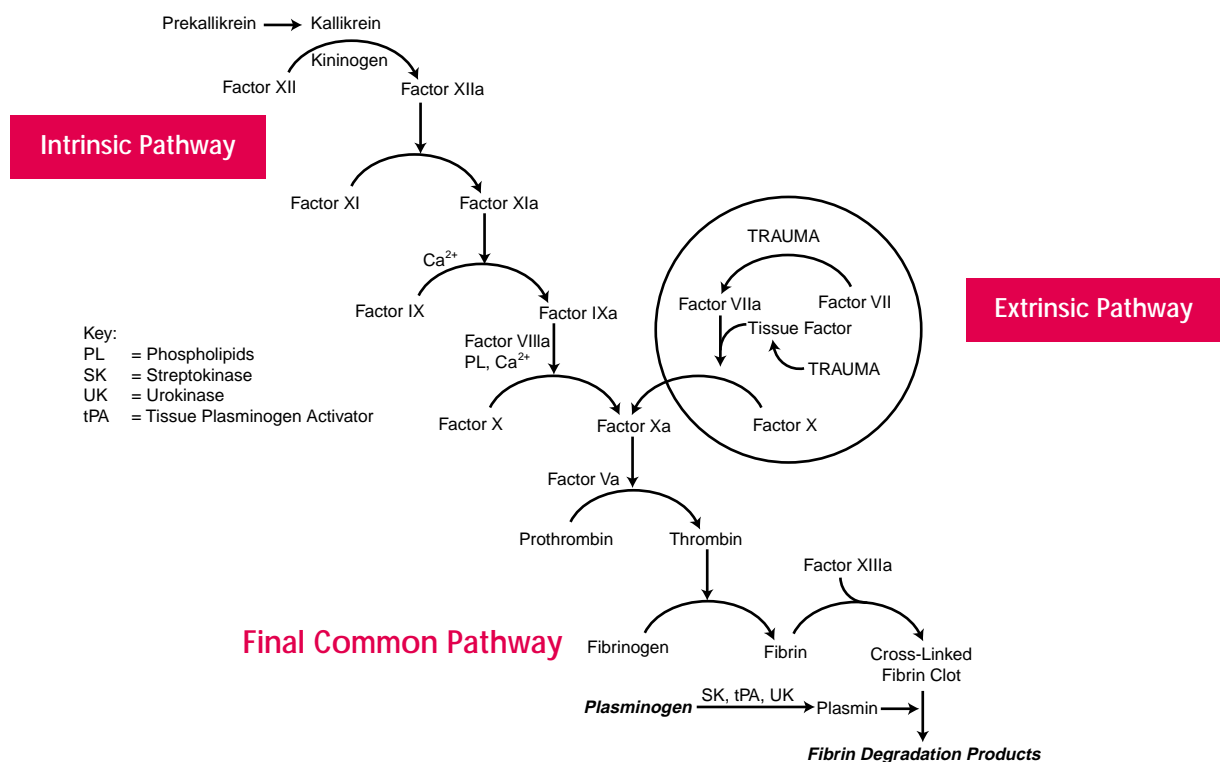
Coagulation Factors

Normal hemostasis in humans and other animals is a complex yet exquisitely well-regulated process. It entails the interaction of a large number of plasma glycoproteins with blood platelets and vascular endothelial cells. Most of the plasma glycoproteins that participate in the process of blood coagulation are secreted as zymogens which interact in a stepwise manner through a series of reactions. At each step, a protease from the preceding step, a zymogen, a non-enzymatic protein co-factor, Ca^{2+} , and an organizing surface (such as platelets) are involved. This close sequential relationship between various interacting systems serve to limit blood loss, preserve tissue perfusion, and stimulate local repair processes.

The initial response to injury causes vasoconstriction, attracts circulating platelets to the site of injury, and activates coagulation proteins. The main initiating pathway of coagulation process is the "extrinsic pathway" where the interaction of tissue factor and Factor VII occurs. Although the "intrinsic

pathway" is no longer considered to be the initiator of coagulation, it is believed that Factor XIa serves as an important amplification pathway of the coagulation system *in vivo*. The extrinsic system also stimulates the final common pathway. The intrinsic system is activated by the interaction of Factor XII with a negatively charged surface, such as collagen, and through a series of reactions with prekallikrein, Factors XI, IX, and VIII, the common coagulation pathway is disseminated. Activation of the intrinsic and extrinsic coagulation pathways results in the formation of fibrin from fibrinogen by the action of thrombin. Thrombin converts fibrinogen to fibrin monomers by cleaving fibrinopeptides A and B from the amino terminal ends of the α and β chains, respectively. Subsequently, Factor XIIIa catalyzes the cross-linking of adjacent fibrin monomers to strengthen the clot.

References: Rock, G., and Wells, P. 1997. *Crit. Rev. Clin. Lab. Sci.* **34**, 475; Langner, K.D., et al. 1990. *Behring Inst. Mitt.* **86**, 146; Majerus, P.W., et al. 1990. In *The Pharmacological Basis of Therapeutics*, 8th Edition (Gilman, A.G., et al.) pp. 1311-1331, New York, Pergamon Press.



Antibodies to Coagulation Factors

Product Name	Applications	Description	Cat. No.	Unit Size
Anti-Coagulation Factor VIII, Human (Mouse)	ELISA	Monoclonal antibody specific for human Factor VIII	233410	100 µg
Anti-Coagulation Factor VIIIc, Human (Mouse)	ELISA, IB, NT	Monoclonal antibody specific for large molecules of human Factor VIIIc (procoagulant Factor VIII)	233413	100 µg
Anti-Coagulation Factor XII, Human (Rabbit)	IP, OT	Polyclonal antibody specific for human Factor XII	233504	1 ml
Anti-Coagulation Factor XIII, A-Subunit, Human Placenta (Rabbit)	ELISA, IB	Polyclonal antibody specific for human Factor XIII A-Subunit	233502	1 ml
Anti-Coagulation Factor XIII, S-Subunit, Human (Rabbit)	IP, OT	Polyclonal antibody specific for human Factor XIII, S-Subunit	233503	1 ml

ELISA: enzyme-linked immunosorbent assay; IB: immunoblotting; IP: immunoprecipitation; NT: neutralization; OT: ouchterlony

Plasma Proteins

Product Name	Comments	Cat. No.	Unit Size
Fibrinogen, Human Plasma	An acute phase plasma glycoprotein, essential for clotting blood. Conversion of soluble fibrinogen to the insoluble clot-forming fibrin is the terminal stage of blood clotting.	341576	100 mg 1 g
Fibrinogen, Human Plasma, Plasminogen-Depleted	The plasminogen was depleted using a Lys-agarose column.	341578	500 mg
Fibrinogen, Fragment D, Human Plasma	Thermolabile fragment. The D and E fragments have no common antigenic determinants; therefore, no cross-reactivity occurs.	341600	200 µg
Fibrinogen, Fragment E, Human Plasma	Thermostable fragment. The D and E fragments have no common antigenic determinants; therefore, no cross-reactivity occurs.	341605	100 µg
Prothrombin, Human Plasma	Vitamin K-dependent glycoprotein synthesized in the liver. Its conversion to thrombin is a key step in the blood coagulation pathway.	539515	1 mg 2 mg
Thrombin, Human Plasma	Key enzyme in the coagulation cascade. Converts fibrinogen into fibrin and activates factor XIII, which cross-links and stabilizes the fibrin polymer.	605190	100 U 1000 U
Thrombin, Human Plasma, High Activity	Prepared from homogeneous human prothrombin by activation with Factor Xa, Factor Va, and phospholipid. Designed for use in thrombin time tests.	605195	100 U 1000 U 5000 U
Thrombin, Citrate-Free, Human Plasma	Formulation useful for procedures in which the presence of citrate is undesirable.	605206	100 U
Thrombin, Immobilized, Human Plasma	Each vial contains 1 ml of cross-linked beaded 6% agarose gel without a spacer in 50 mM K ₂ HPO ₄ , 0.02% NaN ₃ , pH 7.5. Contains 250 µg Thrombin (Cat. No. 605190) per ml of gel.	605204	1 ml

Coagulation Factors

Product Name	M.W.	Description	Cat. No.	Unit Size
Coagulation Factor V, Human Plasma	300,000	Non-enzymatic protein cofactor present in plasma and platelets. Thrombin cleaves Factor V to yield activated Factor Va that has about 50 fold greater activity than the precursor molecule.	219365	100 µg
Coagulation Factor VII, Human Plasma	50,000	Complexes with Factor VII in the presence of phospholipids. Activates Factor X to its activated form, Xa.	219367	10 µg
Coagulation Factor VIIa, Human Plasma	48,000	Activates Factor X. Also activates Factor IX in the presence of Tissue Factor, providing a crossover point between the extrinsic and intrinsic pathways.	219370	10 µg
Coagulation Factor IX, Human Plasma	58,700	After activation with Ca ²⁺ to its active form, it participates in the intrinsic blood coagulation cascade.	233279	100 µg
Coagulation Factor IXaβ, Human Plasma	45,000	Factor XIa activates Factor IX in a two-step reaction. First, an internal Arg-Ala bond is cleaved followed by cleavage of an Arg-Val bond leading to the liberation of an activation peptide from the amino terminal of the heavy chain to produce Factor IXaβ.	233290	100 U
Coagulation Factor X, Human Plasma	58,000	Present as a zymogen. Activation of the zymogen by Tissue Factor and Factor VIIa yields Factor Xa that converts prothrombin to thrombin.	233282	100 U
Coagulation Factor Xa, Human Plasma	46,000	Factor Xa and Factor Va activate prothrombin to thrombin in the presence of Ca ²⁺ and membrane phospholipid. Factor Xa activity is inhibited by AEBSF (Cat. No. 101500), PMSF (Cat. No. 52332), and trypsin inhibitor (Cat. No. 650357).	233526	10 U
Coagulation Factor XI, Human Plasma	160,000	Factor XI is activated to Factor XIa by Factor XIIIa. It migrates as a single band on 6% SDS-PAGE gels in the absence of reducing agents. Consists of two identical polypeptide chains linked by disulfide bonds, that yield a single band at 80,000 on reduction with β-mercaptoethanol.	233480	100 µg
Coagulation Factor XIa, Human Plasma	160,000	Factor XIa activates Factor IX to IXa. Prepared from homogeneous Factor XI using Factor XIIIa that is removed using a corn trypsin inhibitor column.	233483	100 µg
Coagulation Factor XII, Human Plasma	80,000	A single-chain polypeptide component of contact activation system. Once activated, principally from the action of kallikrein, Factor XII is converted to Factor α-XIIa (serine protease) that functions in the initiation of blood coagulation, fibrinolysis, and kinin formulation.	233490	500 µg
Coagulation Factor α-XIIa, Human Plasma	80,000	A serine protease that activates Factor XI to Factor XIa.	233493	500 µg
Coagulation Factor β-XIIa, Human Plasma	30,000	Activates plasma prokallikrein and Factor XI. Also initiates kinin generation, intrinsic fibrinolysis, and renin-angiotensin activation.	233496	200 mU
Coagulation Factor β-XIIa Substrate, Colorimetric	776.7	A specific colorimetric substrate for human coagulation factor β-XIIa.	233500	10 mg
Coagulation Factor XIII, Human Plasma	340,000	Requires thrombin and Ca ²⁺ for activation. Activated form promotes covalent bond formation between fibrin filaments. Plasma Factor XIII is composed of two dimeric subunits (α ₂ β ₂). The α ₂ -dimer is the catalytic subunit.	233501	100 µg

Please call our Technical Service Department or your local sales office for more information on these products.

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