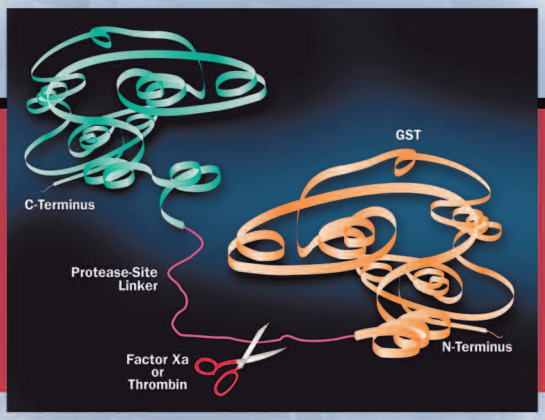
Haematologic Technologies Inc.

Thrombin and Factor Xa

- Human, bovine and mouse plasma thrombin and Xa available
- Available in active-site blocked formulations
- >95% pure
- Custom formulations available

For use in coagulation experiments, fusion protein cleavage, as standards or controls, and crystallography.



Thrombin

Alpha-thrombin is a serine protease and a key enzyme in the blood coagulation and wound healing processes. Thrombin is generated by proteolytic activation of the zymogen prothrombin and is commonly recognized as the enzyme responsible for the conversion of fibrinogen to fibrin. In addition to cleaving fibrinogen, thrombin is responsible for activating platelets and is indirectly responsible for regulation of its own production and inhibition through multiple proteolytic feedback pathways which include the activation of factors V, VIII, XI and Protein C. The central importance of thrombin to the overall coagulation process is established by the fact that any perturbation within the blood coagulation system that results in significantly amplified or impaired as well as accelerated or delayed thrombin generation will result in clinically relevant hemorrhagic or thrombotic events. Thrombin activity is down-regulated by inactivation of the cofactors, factor Va and VIIIa or by direct inhibition of thrombin by its principal inhibitor, anti-thrombin-III.

In addition to its pivitol role in the blood coagulation process, thrombin also contributes to the wound healing process. It activates protease activated receptor-1 (PAR-1) and in this manner can affect cellular function, growth and proliferation. Intact thrombin, as well as fragments of thrombin, have also been shown to have angiogenic, mitogenic and chemotactic activities.

Factor Xa

Factor Xa is a serine protease that is produced by activation of the zymogen, factor X, by either the intrinsic or extrinsic factor tenase complexes. Factor Xa is the enzyme component in the prothrombinase complex (factor Xa, factor Va, negatively charge cell membrane and calium ion), which catalyzes the rapid conversion of prothrombin to thrombin. Although factor Xa alone can convert prothrombin to thrombin, assembly of the prothrombinase complex results in a 300,000-fold increase in the rate of prothrombin conversion. Factor Xa activity is down-regulated by inactivation of the cofactor, factor Va or by direct inhibition of factor Xa by its principal inhibitor, anti-thrombin-III.

Continued on reverse

Haematologic Technologies, Inc.

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Applications

HTI's thrombin and factor Xa products are highly purified preparations that are ideal for:

a) general coagulation experiments; b) standards and/or controls in functional assays;
c) inhibitor screening, development and characterization studies; and
d) crystallography studies.

In addition to their broad applications in coagulation research thrombin and Xa can be used for site specific cleavage of fusion proteins. A thrombin or factor Xa sensitive site is incorporated between the recombinant protein of interest and peptides or proteins which facilitate purification and/or expression. The target protein is released from the expressed hybrid by cleavage with thrombin. Thrombin can then be easily removed by affinity chromatography. Lot to lot consistency ensures reproducible results every time. For experiments involving cell cultures, please contact us to discuss custom, low endotoxin lots designated for cell culture use.

Purified Proteins

Thrombin is prepared from purified prothrombin using a modification of the Lundblad procedure (1) as described by Nesheim et al. (2). The purified protein is then assayed for activity versus NIH standard thrombin, and is supplied >95% pure (by SDS-PAGE) in a 50% glycerol/water (v/v) solution.

Factor Xa is prepared by activating purified factor X with the factor X activator isolated from Russell's viper venom. Factor Xa is purified from the activation mixture by chromatography, assayed for activity, and is supplied >95% pure (by SDS-PAGE) in a 50% glycerol/water (v/v) solution.

Product	Catalog No.	Product	Catalog No.
Human alpha-Thrombin	HCT-0020	Human Factor Xa	HCXA-0060
Human alpha-Thrombin blocked with DFP	HCT-DFP	Human beta-Factor Xa	HCBXA-0061
Human alpha-Thrombin blocked with PPACK	HCT-FPRCK	Human gla-domainless beta-Factor Xa	HCXA-GD
Human alpha-Thrombin blocked w/biotinylated PPACK	HCT-BFPRCK	Human Factor Xa blocked with EGR	HCXA-EGR
Human beta-Thrombin	HCBT-0022	Human Factor Xa blocked with DEGR	HCXA-DEGR
Human gamma-Thrombin	HCGT-0021	Human Factor Xa blocked with BEGR	HCXA-BEGR
Bovine alpha-Thrombin	BCT-1020	Bovine Factor Xa	BCXA-1060
Bovine alpha-Thrombin blocked with DFP	BCT-DFP	Bovine Factor Xa blocked with EGR	BCXA-EGR
Bovine alpha-Thrombin blocked with PPACK	BCT-FPRCK	Bovine Factor Xa blocked with DEGR	BCXA-DEGR
Bovine alpha-Thrombin blocked w/biotinylated PPACK	BCT-BFPRCK		
Mouse Thrombin	MCT-5020		

References

1. Lundblad, R.L., et al., Methods Enzymol., 45, 156 (1976).
2. Nesheim, M.E., et al., J. Biol. Chem., 258, 5386 (1983).

Haematologic Technologies Inc.

Haematologic Technologies, Inc is a primary manufacturer of high-quality coagulation proteins and research reagents including: purified plasma zymogens, enzymes, cofactors, inhibitors, substrates, antibodies, sample collection tubes and ELISA reagents.

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